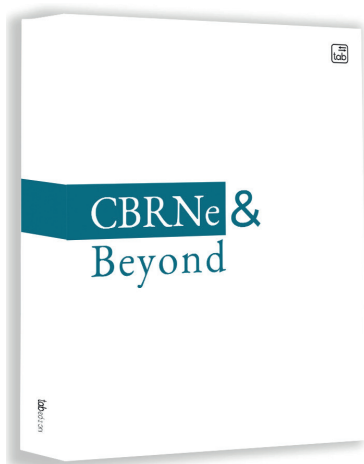




2ND SCIENTIFIC  
INTERNATIONAL  
CONFERENCE  
ON CBRNe  
**SICC SERIES**  
... 2020 ...

10-12 DECEMBER 2020  
**BOOK OF ABSTRACT**





## CBRNe & Beyond

Conventional and Non  
Conventional Emergencies:  
from Research, Education and  
Training to the Management  
and Recovery of Normality

The conventional and non conventional emergencies is a macro definition including all the events that can affect, directly or indirectly, the safety and the security at local, regional, national or international levels. The Covid-19 pandemic situation such as the Spanish flu, the Chernobyl accident such as the Fukushima's one, the chemical attack in Ypres such as the subway release of Sarin in the subway in Tokyo are just few example representing some of the historical recurrences that can be classified as natural, accidental, intentional or war related events or as biological, radiological/nuclear, chemical events. There are many aspects to consider in order to face those events and the related consequences: experts and technologies availabilities, national and international intervention and cooperation plans, prevention plans, education and training programs, research projects, emergency management plans, communication systems, recovery of normality, logistic, economical and legal aspects, business continuity and so on. It is indubitable that an emergency involve, directly or indirectly, the entire society. This is way this scientific & editorial project want to collect all the aspects related to the emergency, *CBRNe & Beyond* has the purpose to be a point of convergence of expertise, experiences and lessons learned to improve safety and security worldwide in order to reach the recovery of normality after an event.

### Scientific organization

The book series is conceived, organized, realized, promoted & supported by all those who attended the International Conference on CBRNe SICC Series | 2020 in collaboration with tab edizioni.

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*book series web page*

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The importance of a multidisciplinary approach  
for International Research Cooperation

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10-12 December 2020

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# SICC Series – CBRNe Conference

## Aims of the Conference:

- SICC Series Conference on CBRNe is the second scientific international conference series on safety & security issues in the CBRNe field (Chemical, Biological, Radiological, Nuclear and explosive). It represents the natural development of the long-standing experience achieved in the field of CBRNe education and training thanks to the International Master Courses in Protection against CBRNe Events of the University of Rome Tor Vergata.
- Spreading education beyond its boundaries to turn CBRNe into an academic discipline.
- Create a synergic global community of CBRNe experts and Enhancing CBRNe.
- Safety & Security multi-disciplinary scientific research.

## Expected outcomes:

The experience gained have led us to organize these international scientific conferences. SICC Series Conference primary objective is to internationally promote the dissemination of the culture on the prevention and mitigation of CBRNe events.

In the common struggle for safety & security, SICC Series Conferences are devoted to highlight the state-of-the-art and the future needs of the different methodologies, techniques, theories, instruments, strategies, procedures, technologies and best practices on the prevention and mitigation of CBRNe risks, particularly in the spirit of collaboration and integration among States.

The world of CBRNe today mainly concerns only the military experts, the specialized operators, and the industry. However, institutional task of the University is also spreading the education on CBRNe beyond its traditional boundaries. The experience we have gained so far has led us to an ambitious vision: the CBRNe should become a scientific academic discipline. This new way of approaching the matter will have significant consequences: on the one hand the possibility to train young minds enabling them to deal with problems related to the safety & security identifying new solutions, and on the other hand to spread and increase the information and awareness of the risks and therefore to increase preparedness and resiliency. SICC 2020 represents a small but important step towards these ambitious goals.

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**General Program  
SICC SERIES CBRNe  
10-12 December 2020**






<b>Technical Table 1 (10 December 2020)</b> - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Leonardo Chairpersons: Dr. Duschek, Prof. Gaudio, Prof. Perez Diaz <b>T.1. Biological, Chemical and explosive (BCE) Events</b>	
<b>DAY 1</b> <b>10 December 2020</b> 08:20 a.m. - 01.00 p.m (UTC+1 - Italian Time)	  
T.1-D.1-O.1	<b>AUTONOMOUS, TRANSPORTABLE LIF BASED DETECTION SYSTEM FOR FAST IN SITU CLASSIFICATION OF BIOLOGICAL HAZARDS</b> J. Grzesiak <sup>1</sup> , Ch. Kölbl <sup>1</sup> , M. Kraus <sup>1</sup> , L. Fellner <sup>1</sup> , K. Grünewald <sup>1</sup> , and F. Duschek <sup>1</sup> <i>1. German Aerospace Center (DLR), Institute of Technical Physics, Im Langen Grund 4, 74239 Hardthausen, Germany</i>
T.1-D.1-O.2	<b>AERIAL REMOTE SENSING OF HAZARDOUS CBE AGENTS BY MEANS OF AN UAV-AIDED LASER BASED STANDOFF DETECTION SYSTEM</b> Christoph Kölbl <sup>1</sup> , Daniel Weigl <sup>1</sup> , Jonas Grzesiak <sup>1</sup> , Frank Duschek <sup>1</sup> <i>1. German Aerospace Center (DLR), Institute of Technical Physics, 74239 Hardthausen, Germany</i>
T.1-D.1-O.3	<b>LASER BASED TECHNIQUES FOR CHEMICAL DETECTION AND IDENTIFICATION AT UNIVERSITY OF ROME TOR VERGATA, ACTUAL AND FUTURE CAPABILITIES.</b> Pasquale Gaudio <sup>1</sup> <i>1. Department of Industrial Engineering – University of Rome Tor Vergata, Via del Politecnico 1, 00133 Roma, Italy.</i>
T.1-D.1-O.4	<b>SURFACE-ENHANCED RAMAN SPECTROSCOPY FOR THE DETECTION OF CHEMICAL-BIOLOGICAL AGENT IN TRACES: AN INNOVATIVE TECHNIQUE FOR THE RAPID DETECTION OF SECURITY AND COUNTERTERRORISM ISSUES</b> Salvatore Alimaviva <sup>1</sup> , Florinda Artuso <sup>1</sup> , Antonella Lai <sup>1</sup> , Isabella Giardina <sup>1</sup> , Antonio Palucci <sup>1</sup> , Alessandra Pasquo <sup>1</sup> <i>1. ENEA, Diagnostics and Metrology Laboratory, ESN-TECFIS-DIM, via Enrico Fermi, 45, I-00040, Frascati, Italy</i>

<b>Technical Table 1 (11 December 2020)</b> - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Leonardo Chairpersons: Dr. Duschek, Prof. Gaudio, Prof. Perez Diaz <b>T.1. Biological, Chemical and explosive (BCE) Events</b>	
<b>DAY 2</b> <b>11 December 2020</b> 08:20 a.m. - 01.00 p.m (UTC+1 - Italian Time)	  
T.1-D.2-O.1	<b>ION MOBILITY SPECTROMETRY IN THE CBRN AREA</b> Wolf Münchmeyer <sup>1</sup> , Andreas Walte <sup>1</sup> <i>1. AIRSENSE Analytics GmbH</i>
T.1-D.2-O.2	<b>DRYVHP: A NEW BIODECONTAMINATION TECHNOLOGY</b> Fernando Antunes <sup>1</sup> <i>1. Centro de Química Estrutural, Faculdade de Ciências, Universidade de Lisboa, and Delox</i>
T.1-D.2-O.3	<b>MEASURES TO PREVENT TOTAL COLIFORM VIOLATIONS IN THE COMPLIED CHLORINE TREATED WATER AT THE WATER TREATMENT PLANT AND IN WATER DISTRIBUTION SYSTEMS</b> Ramani Bai V. <sup>1,2</sup> , Ang C. K. <sup>3</sup> , and Kangadharan G. <sup>3</sup> <i>1. Department of Civil Engineering, UCSD University Kuala Lumpur,</i> <i>2. Faculty of Engineering, Technology and Built Environment, UCSD University Kuala Lumpur,</i> <i>3. Alpha Cambridge International School, Tiruchirappalli, South India.</i>
T.1-D.2-O.4	<b>REAL TIME DETECTION OF CHEMICAL WARFARE AGENTS AT NATO DETECTION LEVELS FOR SURFACE CONTAMINATION</b> Dieter Rothbacher <sup>1</sup> , Philipp Sulzer <sup>2</sup> , Rene Gutmann <sup>2</sup> <i>1. CBRN Protection GmbH, Brigittagasse 44/25-26, 1200 Vienna Austria</i> <i>2. IONICON Analytik GmbH, Eudard-Bodem-Gasse 3, 6020 Innsbruck, Austria</i>

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<b>DAY 1</b> <b>10 December 2020</b> 08:20 a.m. - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T.1-D.1-O.5</b> 10.00 a.m. - 10.25 a.m.	<b>LASER INDUCED FLUORESCENCE (LIF) DETECTION AND DISCRIMINATION OF BACTERIA FROM OILS, POLLEN, AND CHEMICALS: EVALUATION OF MEDIUM SIZED SAMPLE SETS AND EVALUATION OF CLASSIFICATION ROBUSTNESS</b>  Lea Fellne <sup>1</sup> , Marian Kraus <sup>1</sup> , Arne Walter <sup>1</sup> , Frank Duschek <sup>1</sup> <ol style="list-style-type: none"> <li>1. <i>German Aerospace Center, Institute of Technical Physics, Langer Grund, Lampoldshausen, 74239 Harthausen, Germany</i></li> </ol>
<b>T.1-D.1-O.6</b> 10.25 a.m. - 10.50 a.m.	<b>CAN LAB ON-CHIP AND ORGAN-ON-CHIP DEVICES REPRESENT A NOVEL TOOL TO STUDY CHEMICAL AND BIOLOGICAL AGENTS INTERACTION WITH BIOLOGICAL MODELS?</b>  D. Di Giuseppe <sup>1,2</sup> , M. C. Comes <sup>1,2</sup> , M. D'Orazio <sup>1,2</sup> , P. Casti <sup>1,2</sup> , J. Filippi <sup>1,2</sup> , A. Mencattini <sup>1,2</sup> , C. Di Natale <sup>1</sup> , E. Martinelli <sup>1,2</sup> <ol style="list-style-type: none"> <li>1. <i>Dept. Electronic Engineering, University of Rome Tor Vergata, Rome, Italy</i></li> <li>2. <i>Interdisciplinary Center of Advanced Study of Organ-on-Chip and Lab-on-Chip Applications (IC-LOC), University of Rome Tor Vergata, Rome, Italy</i></li> </ol>
<b>T.1-D.1-O.7</b> 10.50 a.m. - 11.15 a.m.	<b>RDX REMOTE RAMAN DETECTION ON NATO SET-337 SAMPLES</b>  Luca M. L. Cantu, Emanuel C. A. Gallo, Frank Duschek  <ol style="list-style-type: none"> <li>1. <i>DLR, German Aerospace Center</i></li> </ol>
<b>T.1-D.1-O.8</b> 11.15 a.m. - 11.40 a.m.	<b>MONOLITHIC SYNTHETIC SINGLE CRYSTAL DIAMOND BASED AE-E CHARGED PARTICLE TELESCOPE</b>  S. Cesaroni, M. Marinelli, E. Milani, S. Palomba, C. Veronzi, G. Verona-Rinati <ol style="list-style-type: none"> <li>1. <i>Department of Industrial Engineering—University of Rome Tor-Vergata, Via del Politecnico 1, 00133 Roma, Italy.</i></li> </ol>




<b>Technical Table 1 (11 December 2020)</b> - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Leonardo Chairpersons: Dr. Duschek, Prof. Gaudio, Prof. Perez Diaz <b>T.1. Biological, Chemical and explosive (BCE) Events</b>	
<b>DAY 2</b> <b>11 December 2020</b> 08:20 a.m. - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T.1-D.2-O.5</b> 10.00 a.m. - 10.25 a.m.	<b>DEVICES IN COMBINATION WITH CBRN PAYLOADS AND RELATED RSPS</b>  Marco Appodia <sup>1</sup> <ol style="list-style-type: none"> <li>1. <i>European Centre for Manual Neutralisation Capabilities (ECMAN)</i></li> </ol>
<b>T.1-D.2-O.6</b> 10.25 a.m. - 10.50 a.m.	<b>THE CERTAINTY OF EFFECTIVE DECONTAMINATION</b>  Antonio Nuñez Ortuño <sup>1</sup> , Luis Rodríguez Álvarez de Lara <sup>1</sup> <ol style="list-style-type: none"> <li>1. <i>Military Emergency Unit. Ministry of Defence. Spain</i></li> </ol>
<b>T.1-D.2-O.7</b> 10.50 a.m. - 11.15 a.m.	<b>PROTECTION OF CIVIL SOCIETY IN A YUCA WORLD. CASE STUDY: LIBRARY FREE BULK DETECTION OF EXPLOSIVES - COMBINING SIMPLE SENSORS FOR RESOLVING A COMPLICATED ISSUE</b>  Kostyantyn Konstantynovskiy <sup>1</sup> , Christof Hammer <sup>1</sup> , Gerald Nijjo <sup>2</sup> , Niklas Wenzel <sup>2</sup> , Gerhard Holll <sup>3</sup> , Thomas M. Klapotke <sup>3</sup> <ol style="list-style-type: none"> <li>1. <i>German Aerospace Center (DLR), Institute for the Protection of Terrestrial Infrastructures (PI), Rathausallee 12, 53757 Sankt Augustin, Germany</i></li> <li>2. <i>University of Applied Sciences Bonn-Rhein-Sieg (BRSU), Institute for Detection Technologies (IDT), von-Liebig Str. 20, 53355 Rheinbach, Germany</i></li> <li>3. <i>Ludwig-Maximilians' University Munich (LMU), Department of Chemistry, Barenandtstrasse 5-13, Haus D, 81377 Munich, Germany</i></li> </ol>
<b>T.1-D.2-O.8</b> 11.15 a.m. - 11.40 a.m.	<b>HI 99: TECHNOLOGIES TO SUPPORT THE RESCUE</b>  Luigi Palestini <i>International Master Courses in Protection Against CBRNe events</i>



<p>Technical Table 1 (10 December 2020) - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time)</p> <p>Virtual Room: Leonardo</p> <p>Chairpersons: Dr. Duscsek, Prof. Gaudio, Prof. Perez Diaz</p> <p><b>T.1. Biological, Chemical and explosive (BCE) Events</b></p>	
<p><b>DAY 1</b></p> <p><b>10 December 2020</b></p> <p>08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time)</p>	  
<p><b>T.1-D.1-O.9</b></p> <p>11.40 a.m. - 12.05 a.m.</p>	<p><b>CHARACTERIZATION OF CARBON COMPOUNDS FROM BINDER AND PLASTICIZERS OF EXPLOSIVES</b></p> <p>Chiara Tello<sup>1</sup>, Antonietta Rizzo<sup>1</sup>, Alberto Ubaldini<sup>1</sup>, Giuseppe Ottaviano<sup>1</sup>, Stefano Salvi<sup>1</sup></p> <p><sup>1</sup>. <i>ENEA, Bologna Research Center, Fusion and Technology for Nuclear Safety and Security Department, Nuclear Safety Security and Sustainability Division, via Martini di Monte Sole 4, 40129, Bologna, Italy</i></p>
<p><b>T.1-D.1-O.10</b></p> <p>12.05 a.m. - 12.30 a.m.</p>	<p><b>EJ-SENSE – A MODERN CBRNE TOOL FOR IMPROVING THE SITUATIONAL AWARENESS OF FIRST RESPONDERS</b></p> <p>Łukasz Szklarski<sup>1</sup>, Patryk Maik<sup>1</sup>, Robert Sigg<sup>2</sup></p> <p><sup>1</sup>. <i>ITP Sp. z o.o., 61-612 Poznań, Poland</i></p> <p><sup>2</sup>. <i>FÖI, Totalförsvarets forskningsinstitut, 164 90 Stockholm, Sweden</i></p>
<p><b>T.1-D.1-O.11</b></p> <p>12.30 a.m. - 12.55 a.m.</p>	<p><b>SAMPLING AND ANALYSIS OF CHEMICAL WARFARE AGENTS: IMPROVING IDENTIFICATION, THROUGHPUT AND RELIABILITY</b></p> <p>Caroline Widdowson<sup>1</sup>, Helen Martin<sup>1</sup></p> <p><sup>1</sup>. <i>Markes International</i></p>




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<p><b>DAY 2</b></p> <p><b>11 December 2020</b></p> <p>08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time)</p>	  
<p><b>T.1-D.2-O.9</b></p> <p>11.40 a.m. - 12.05 a.m.</p>	<p><b>UV REMOTE RAMAN DETECTION OF CHLORINE</b></p> <p>Emmanuela Gallo<sup>1</sup>, Frank Duscsek<sup>1</sup></p> <p><sup>1</sup>. <i>German Aerospace Center, Institute of Technical Physics, 74239 Hardthausen, Germany</i></p>
<p><b>T.1-D.2-O.10</b></p> <p>12.05 a.m. - 12.30 a.m.</p>	<p><b>CYANIDE REMEDIATION BY ADSORPTION AND BIOSORPTION PROCESS</b></p> <p>Jahnavi M.<sup>1</sup>, Madhumala. Y.<sup>2</sup></p> <p><sup>1</sup>. <i>Civil Engineering Department, Basaveshwar Engineering College –Bagalkot</i></p> <p><sup>2</sup>. <i>Department of Biotechnology, Basaveshwar Engineering College –Bagalkot</i></p>

<p>Technical Table 2 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)  Virtual Room: Leonardo  Chairpersons: Prof. Palombi, Prof. Hosin and Prof. Vasiliou  <b>T.2. Epidemics, Medical Management and First Aid, Psychology</b></p>	
<p><b>DAY 1</b>  10 December 2020  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  
<p><b>T.2-D.1-O.1</b>  02.00 p.m - 02.25 p.m.</p>	<p><b>FIGHT AGAINST COVID: INTERVENTION OF THE BIOLOGICAL LIGHT FIELDABLE LABORATORY FOR EMERGENCIES (B-LIFE / UCLouvain) IN TURIN AND NOVARA, PIEDMONT, ITALY.</b></p> <p>Jean-Luc Gala<sup>1</sup>  1. <i>Center for Applied Molecular Technologies, Université catholique de Louvain (UCL-CTMA)</i></p>
<p><b>T.2-D.1-O.2</b>  02.25 p.m - 02.50 p.m.</p>	<p><b>PREVENTION PROCEDURES TO CONTAIN COVID-19 CONTAGION IN THE FIRST ITALIAN ARMY FIELD HOSPITAL</b></p> <p>Gennaro Palermo<sup>1</sup>, Paolo Pagliaro<sup>2</sup>, Mario Ciccotti<sup>3</sup>  1. <i>Chief Operating Room, Army Medical Center, Rome, Italy</i>  2. <i>Department of Anesthesia and Resuscitation, Army Medical Center, Rome, Italy</i>  3. <i>Joint Veteran Center, Scientific Department, Army Medical Center, Rome, Italy</i></p>
<p><b>T.2-D.1-O.3</b>  02.50 p.m - 03.15 p.m.</p>	<p><b>BIOLOGICAL RISK IN ITALIAN PRISONS: FROM THE COVID-19 MANAGEMENT TO THE DEVELOPMENT OF A NEW MODEL FOR EMERGENCY RESPONSE</b></p> <p>Cristiano Franchi<sup>1</sup>, Fabrizio Ferri<sup>2</sup>, Stefania Moramarco<sup>3</sup>, Mariachiara Carestia<sup>3,4</sup>  1. <i>International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i>  2. <i>Department of Infectious Diseases and Prison Health Service - Hospital "Belcolle" Viterbo</i>  3. <i>Department of Biomedicine and Prevention, University of Rome Tor Vergata, Italy</i></p>
<p><b>T.2-D.1-O.4</b>  03.15 p.m - 03.40 p.m.</p>	<p><b>THE IMPACT OF THE PATIENT'S STATE ON THE DESTINATION CARE UNIT CHOICE DURING A PRE-HOSPITAL HEALTH EMERGENCY</b></p> <p>Ibtissam Khaifau<sup>1</sup> and Amar Hammouch<sup>2</sup>  1. <i>Mohammadia School of Engineers, department of Industry, Mohamed V University, Rabat, Morocco</i>  2. <i>PES, Research Team IMOSYS, department of Industry, Mohammadia School of Engineers, Mohamed V University, Rabat, Morocco</i></p>

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<p><b>DAY 2</b>  11 December 2020  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  
<p><b>T.2-D.2-O.1</b>  02.00 p.m - 02.25 p.m.</p>	<p><b>BUILDING MENTAL HEALTH RESILIENCY AMONG THE PUBLIC AND EMERGENCY STAFF IN THE WAKE OF COVID-19 PANDEMIC</b></p> <p>Amer Hosin<sup>1</sup>  <i>Visiting Professor, School of Psychology, University of Ulster, Coleraine, Northern Ireland BT52 1SA, UK</i></p>
<p><b>T.2-D.2-O.2</b>  02.25 p.m - 02.50 p.m.</p>	<p><b>BEING A GYNECOLOGIST DOCTOR SPECIALIZED IN IVF, A MOTHER AND A WOMAN AT THE TIME OF COVID-19</b></p> <p>Ferrero Susanna<sup>1</sup>  1. <i>Studio Medico Dr.ssa Susanna Ferrero</i></p>
<p><b>T.2-D.2-O.3</b>  02.50 p.m - 03.15 p.m.</p>	<p><b>OCCUPATIONAL STRESS AND MENTAL HEALTH WELLBEING OF STAFF WORKING IN HOSPITALS AND MEDICAL /HEALTH SETTINGS DURING THE COVID-19 PANDEMIC</b></p> <p>Rifaat Al Hussein<sup>1</sup>  1. <i>School of Psychology, Faculty of Life and Health Sciences, University of Ulster Coleraine Campus, Northern Ireland BT52 1SA, UK</i></p>
<p><b>T.2-D.2-O.4</b>  03.15 p.m - 03.40 p.m.</p>	<p><b>THE IMPACTS OF COVID-19 ON THE DELIVERY OF EDUCATION</b></p> <p>Amal AIKoo<sup>1</sup>  1. <i>Former under Secretary for Education, UAE</i></p>

<b>Technical Table 2 (10 December 2020)</b> - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time) Virtual Room: Leonardo Chairpersons: Prof. Palombi, Prof. Hosin and Prof. Vasiliou <b>T.2. Epidemics, Medical Management and First Aid, Psychology</b>	
<b>DAY 1</b> <b>10 December 2020</b> 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)	  
<b>T.2-D.1-O.5</b> 03.40 p.m - 04.05 p.m.	<b>VIROLOGICAL ENVIRONMENTAL ANALYSIS</b> Divizia Maurizio <sup>1</sup> <ol style="list-style-type: none"> <li>1. Department of Biomedicine and Prevention, University of Rome Tor Vergata</li> </ol>
<b>T.2-D.1-O.6</b> 04.05 p.m - 04:30 p.m.	<b>PERFORMANCE ASSESSMENT OF COVID-19 SANITARY WASTE MANAGEMENT DONE IN THE KINGDOM OF SPAIN</b> Quiñones Javier <sup>1</sup> , Galvez Jesús <sup>2</sup> , Serrano Julio <sup>3</sup> , Romero José Salvador Romero <sup>4</sup> <ol style="list-style-type: none"> <li>1. Guardia Civil. Interior Affairs Ministry. C/ Batalla del Salado, 32. 28045 – Madrid. Kingdom of Spain</li> </ol>
<b>T.2-D.1-O.7</b> 04.30 p.m - 04:55 p.m.	<b>DECONTAMINATION OF AMBULANCE AND EQUIPMENT, A PROBLEM FOR WORKER SAFETY AND NATIONAL SECURITY</b> F. Rosiello <sup>1</sup> , L. Zelnotti <sup>2</sup> , M. Monti <sup>3</sup> , P. Cosmi <sup>4</sup> , M. Procacciantè <sup>5</sup> , G. Petrelli <sup>6</sup> , M. A. Vinci <sup>7</sup> , E. Doca <sup>8</sup> , E. Desideri <sup>6</sup> , M. Serale <sup>9</sup> <ol style="list-style-type: none"> <li>1. Ph.D. Student at Dipartimento di Scienze Anatomiche Istitologiche Medico Legali e dell'Apparato Locomotore - Università la Sapienza di Roma</li> <li>2. Emergency management, Marino - Roma - Italia</li> <li>3. Emergency department - Assisi Hospital, Via Muller 1, Assisi - Italy,</li> <li>4. Resident in Hygiene and Preventive Medicine – University of Rome Tor Vergata</li> <li>5. Pronto Soccorso, Casa di cura CDC – Sant’Anna – Città di Pomezia S.p.A</li> <li>6. CFISMG: Corso Formazione Specifica Medicina Generale - Regione Lazio (7)ASL Cuneo1, Cuneo, Italy.</li> </ol>

<b>Technical Table 2 (11 December 2020)</b> - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time) Virtual Room: Leonardo Chairpersons: Prof. Palombi, Prof. Hosin and Prof. Vasiliou <b>T.2. Epidemics, Medical Management and First Aid, Psychology</b>	
<b>DAY 2</b> <b>11 December 2020</b> 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)	  
<b>T.2-D.2-O.5</b> 03.40 p.m - 04.05 p.m.	<b>DEFINE, DEVELOP AND DEPLOY A HARMONISED CBRN TRAINING CURRICULUM FOR FIRST RESPONDERS AND MEDICAL STAFF - FIRST</b> Carlos Rojas-Palmaa <sup>1</sup> , Ahmed Nagy <sup>1</sup> , Marike van der Horst <sup>2</sup> , Saskia Ruffe <sup>3</sup> , Maïachara Carestia <sup>4</sup> and Svenja Stovens <sup>5</sup> <ol style="list-style-type: none"> <li>1. SCK CEN, Belgian Nuclear Research Centre: Mol, Antwerp, BE</li> <li>2. TNO DEFENCE SAFETY &amp; SECURITY, Rijswijk, NL</li> <li>3. Centre for Infectious Disease Control, National Institute for Public Health and the Environment (RIVM), Bilthoven, NL</li> <li>4. University of Rome Tor Vergata, Rome, IT</li> <li>5. European CBRNE Center, Umeå University, Umeå, SE</li> </ol>
<b>T.2-D.2-O.6</b> 04.05 p.m - 04.30 p.m.	<b>THE COORDINATION OF A DIAGNOSTIC DEPARTMENT DURING THE SARS-COV-2 PANDEMIC: HOW TO GUARANTEE THE BEST SERVICE</b> Manenti Guglielmo <sup>1</sup> and Malizia Andrea <sup>1</sup> <ol style="list-style-type: none"> <li>1. Department of Biomedicine and Prevention, University of Rome Tor Vergata</li> </ol>
<b>T.2-D.2-O.7</b> 04.30 p.m - 04.55 p.m.	<b>XYLELLA FASTIDIOSA ASSOCIATED TO THE OLIVE QUICK DECLINE SYNDROME (OQDS) IN SOUTHERN ITALY: NATURAL OUTBREAK OR AGROTERRORISM?</b> Arduini D. <sup>1</sup> , Ludovici G.M. <sup>1</sup> <ol style="list-style-type: none"> <li>1. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</li> </ol>

<p>Technical Table 2 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)  Virtual Room: Leonardo  Chairpersons: Prof. Palombi, Prof. Hosin and Prof. Vasiliou  <b>T.2. Epidemics, Medical Management and First Aid, Psychology</b></p>	
<p><b>DAY 1</b>  10 December 2020  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  
<p><b>T.2-D.1-O.8</b></p>	<p><b>TOXICOLOGICAL ASPECTS AND MEDICAL MANAGEMENT OF INCAPACITATING CHEMICAL AGENTS' EXPOSURE IN CBRNE EVENTS: DEFINITION OF A PRACTICAL TOOL.</b></p> <p>Gallo Mariapiña</p> <ol style="list-style-type: none"> <li>1. <i>Poison Control Center, Papa Giovanni XXIII Hospital, piazza OM5, 1- 24127 Bergamo, Italy</i></li> <li>2. <i>International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></li> </ol>
<p>04.55 p.m - 05.20 p.m.</p>	
<p><b>T.2-D.1-O.9</b></p>	<p><b>INSTALLATION EFFECTIVENESS OF A UVC DISINFECTION SYSTEM IN AN HVAC FOR AN ICU DURING COVID-19 PANDEMIC</b></p> <p>Susana O. Souza<sup>1</sup>, Antônio Américo Cardoso Junior<sup>2</sup>, Francesco d'Errico<sup>3,4</sup>, Aquiles Sales Craveiro Sarmiento<sup>5</sup>, Mayk Rodolfo de Jesus Santana<sup>6</sup>, Rafael Ciro Marques Cavalcante<sup>6</sup></p> <ol style="list-style-type: none"> <li>1. <i>Departamento de Física - Universidade Federal de Sergipe - 49100-000 São Cristóvão, SE, Brazil</i></li> <li>2. <i>Departamento de Ciências Florestais - Universidade Federal de Sergipe - 49100-000 São Cristóvão, SE, Brazil</i></li> <li>3. <i>Scuola di Ingegneria - Università di Pisa (UNIP) - Pisa, Italy</i></li> <li>4. <i>Yale Center for Emergency Preparedness and Disaster Response - Yale University - New Haven, CT, USA</i></li> <li>5. <i>Empresa Brasileira de Serviços Hospitalares, Hospital Universitário de Lagarto 49400-000 Lagarto, SE, Brazil</i></li> <li>6. <i>Departamento de Farmácia - Universidade Federal de Sergipe - 49400-000 Lagarto, SE, Brazil</i></li> </ol>
<p>05.20 p.m - 05.45 p.m.</p>	

<p>Technical Table 2 (11 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)  Virtual Room: Leonardo  Chairpersons: Prof. Palombi, Prof. Hosin and Prof. Vasiliou  <b>T.2. Epidemics, Medical Management and First Aid, Psychology</b></p>	
<p><b>DAY 2</b>  11 December 2020  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  
<p><b>T.2-D.2-O.8</b></p>	<p><b>CHEMICAL RISK AS BURDEN ON WORKERS POPULATION: INCIDENCE RATES OF CHEMICAL-RELATED OCCUPATIONAL DISEASES ACROSS ITALY IN THE YEARS 2014-2018 USING INAIL AND ISTAT DATABASES</b></p> <p>Giulia Agosti<sup>1</sup>, Di'Amico Margherita<sup>1</sup>, Biondi Giorgia<sup>1</sup>, Cecchetti Lorenzo<sup>1</sup>, Finamore Nikolaos<sup>2</sup>, Traglia Francesco<sup>1</sup>, Morciano Laura<sup>2</sup></p> <ol style="list-style-type: none"> <li>1. <i>Specialization School of Hygiene and Preventive Medicine, University of Rome Tor Vergata, Rome, Lazio, Italy</i></li> <li>2. <i>Biomedicine and Prevention, University of Rome Tor Vergata, Roma, Lazio, Italy</i></li> </ol>
<p>04.55 p.m - 05.20 p.m.</p>	
<p><b>T.2-D.2-O.9</b></p>	<p><b>ENVIRONMENT EFFECTS ON AEROSOL DYNAMICS. SIMPLE RULES TO PREVENT AEROSOL TRANSMISSION</b></p> <p>Juan Sánchez García Casarubios<sup>1</sup>, José Luis Pérez Díaz<sup>2</sup></p> <ol style="list-style-type: none"> <li>1. <i>Escuela Politécnica Superior. Universidad de Alcalá. Madrid. España</i></li> </ol>
<p>05.20 p.m - 05.45 p.m.</p>	

<p>Technical Table 2 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)</p> <p>Virtual Room: Leonardo</p> <p>Chairpersons: Prof. Palombi, Prof. Hosin and Prof. Vasiliou</p> <p><b>T.2. Epidemics, Medical Management and First Aid, Psychology</b></p>	
<p><b>DAY 1</b></p> <p>10 December 2020</p> <p>02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)</p>	  
<p>T.2-D.1-O.10</p> <p>05.45 p.m - 06.10 p.m.</p>	<p><b>OPERATIONAL EXPERIENCE WITH THE COUNTERFOG® SDR-FogA+ FAST DISINFECTION SYSTEM</b></p> <p>Pérez Díaz, José Luis (1); Sánchez García-Casarrubios, Juan (2); Méndez-Vigo Carranza, Pablo (3); Ruiz Navas, Elisa María (4); Cerrato Moreno, Sandra (5); Núñez Ortuño, Antonio (6); Rodríguez Álvarez de Lara, Luis (6); Iliev Petrov, Mihayl (7); Martín Pérez, Tania (1); Fernández Perea, Gonzalo (1)</p> <p>(1) <i>Universidad de Alcalá (UAH)</i>.</p> <p>(2) <i>SAN JORGE TECNOLÓGICAS S.L. (SJT)</i>.</p> <p>(3) <i>COUNTERFOG EBT DE LA UAH S.L. (COUNTERFOG)</i>.</p> <p>(4) <i>Universidad Carlos III de Madrid (UC3M)</i></p> <p>(5) <i>Cuerpo Nacional de Policía (CNP)</i></p> <p>(6) <i>Unidad Militar de Emergencias (UME)</i></p> <p>(7) <i>MAG SOAR S.L. (MAGSOAR)</i>.</p>
<p>T.2-D.1-O.11</p> <p>06.10 p.m - 06.35 p.m.</p>	<p><b>CULTURE COMPETENCE AND ETHICS IN EMERGENCY AND DISASTER SETTINGS</b></p> <p>Amer Hosin<sup>1</sup>  <i>Visiting Professor, School of Psychology, University of Ulster, Coleraine, Northern Ireland BT52 1SA, UK</i></p>

<p>Technical Table 2 (11 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)</p> <p>Virtual Room: Leonardo</p> <p>Chairpersons: Prof. Palombi, Prof. Hosin and Prof. Vasiliou</p> <p><b>T.2. Epidemics, Medical Management and First Aid, Psychology</b></p>	
<p><b>DAY 2</b></p> <p>11 December 2020</p> <p>02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)</p>	  
<p>T.2-D.2-O.10</p> <p>05.45 p.m - 06.10 p.m.</p>	<p><b>ROMAN HOSPITAL MANAGEMENT OF A POTENTIAL CBRNE EVENTS</b></p> <p>Rosiello Francesco<sup>1</sup>, Vinci Antonio<sup>2</sup>, Ricci Livia<sup>1</sup>, Morrida Khalil Ramla<sup>3</sup>, Monti Manuel<sup>4</sup>, Zelinotti Luca<sup>5</sup>, D'Oca Elisa<sup>6</sup>, Ricci Serafino<sup>7</sup></p> <p>1. <i>Ph D Student in Microbiology, Infectious Disease and Public Health, Sapienza-Università di Roma</i></p> <p>2. <i>Department of Biomedicine and Prevention, University of Rome Tor Vergata</i></p> <p>3. <i>Medical Doctor</i></p> <p>4. <i>PS Assisi</i></p> <p>5. <i>Emergency management</i></p> <p>6. <i>CDC Sant'Anna-Policlinico città di Pomezia</i></p> <p>7. <i>Legal Medicine, Sapienza-Università di Roma</i></p>
<p>T.2-D.2-O.11</p> <p>06.10 p.m - 06.35 p.m.</p>	<p><b>SHAPE-BASED INTELLIGENT MANAGEMENT OF MEDICAL WASTE USING ARTIFICIAL NEURAL NETWORKS</b></p> <p>Ramani Bai V.<sup>1</sup>, Abdul Mazli Hafiz A. M.<sup>2</sup>, Ruzaimah R.<sup>3</sup>, Kangadharan G.<sup>4</sup></p> <p>1. <i>Civil Engineering UC SI University, Malaysia</i></p> <p>2. <i>Department of Environment, Malaysia</i></p> <p>3. <i>Civil Engineering UC SI University, Malaysia</i></p> <p>4. <i>Alpha Cambridge International School, Trichirappalli</i></p>

<p>Technical Table 3 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)  Virtual Room: Galileo  Chairpersons: Prof. Chatterjee, Prof. Illiaschenko and Dr. Battista  <b>T.3- Cybersecurity, Critical Infrastructure, IoT and AI Investigation</b></p>			
<p><b>DAY 1</b>  10 December 2020  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  		
<p><b>T.3-D.1-O.1</b>  02.00 p.m - 02.25 p.m.</p>	<p><b>ARTIFICIAL INTELLIGENCE TOWARD PREDICTIVE RISK PROFILING FOR MASS CASUALTY MANAGEMENT DURING CBRNE-EVENTS</b>  Parag Chatterjee<sup>1,2</sup>, Leandro Cymberknop<sup>3</sup>, Ricardo Armentano<sup>1,2</sup>  1. National Technological University, Buenos Aires, Argentina  2. University of the Republic, Montevideo, Uruguay</p>		
<p><b>T.3-D.1-O.2</b>  02.25 p.m - 02.50 p.m.</p>	<p><b>CBRN SECURITY FOR CRITICAL INFRASTRUCTURE</b>  Ram Athavale<sup>1,2</sup>  1. Department of Defence &amp; Strategic Studies (DSS), Savitribai Phule Pune University, Pune, India  2. Raksha Shakti University, Gandhinagar, India</p>		
<p><b>T.3-D.1-O.3</b>  02.50 p.m - 03.15 p.m.</p>	<p><b>AN AGENT-BASED MODEL TO SIMULATE HETEROGENEOUS CROWD FLOWS IN A CRITICAL INFRASTRUCTURE DURING EMERGENCIES</b>  Umberto Battista<sup>1</sup>, Pietro De Vito<sup>1</sup>, Davide Ottonello<sup>1</sup>  1. Stam S.r.l.</p>		

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<p><b>DAY 2</b>  11 December 2020  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  		
<p><b>T.3-D.2-O.1</b>  02.00 p.m - 02.25 p.m.</p>	<p><b>INTEGRATED INFORMATION MODEL OF ENTERPRISE AND CYBERSECURITY MANAGEMENT SYSTEM: FROM DATA TO ACTIVITY</b>  Vyacheslav Kharchenko<sup>1</sup>, Sergiy Dotsenko<sup>2</sup>, Oleg Illiaschenko<sup>2</sup>  1. National Aerospace University "Kharkiv Aviation Institute" (KhAI), Department of Computer Systems, Networks and Cybersecurity (Ukraine)  2. Ukrainian State University of Railway Transport, Department of Specialized Computer Systems (Ukraine)</p>		
<p><b>T.3-D.2-O.2</b>  02.25 p.m - 02.50 p.m.</p>	<p><b>UAV FLEET BASED ACCIDENT-MONITORING SYSTEMS WITH AUTOMATIC BATTERY REPLACEMENT SYSTEMS: ALGORITHMS FOR</b>  Igor Klyushnikov<sup>1</sup>, Herman Fesenko<sup>1</sup>, Vyacheslav Kharchenko<sup>1</sup>  1. National Aerospace University "Kharkiv Aviation Institute" (KhAI), Department of Computer Systems, Networks and Cybersecurity (Ukraine)</p>		
<p><b>T.3-D.2-O.3</b>  02.50 p.m - 03.15 p.m.</p>	<p><b>THREAT ASSESSMENT METHOD FOR BUILDINGS IN CASE OF TERRORIST ATTACKS</b>  Marco Carbonelli<sup>1</sup>, Mariachara Carestia<sup>1</sup>, Riccardo Quaranta<sup>1</sup>  1. Department of Industrial Engineering, University of Rome Tor Vergata</p>		




Technical Table 3 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Chatterjee, Prof. Illiaschenko and Dr. Battista <b>T.3 - Cybersecurity, Critical Infrastructure, IoT and AI Investigation</b>	
<b>DAY 1</b> 10 December 2020 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)	  
<b>T.3-D.1-O.4</b> 03.15 p.m - 03.40 p.m.	<b>TRANSTUN - "TRANSnational TUNnel operational CBRN risk mitigation"</b> Federico Benelli <sup>1</sup> , Marta Di Giacinto <sup>2</sup> , TRANSTUN Staff TRANSTUN STAFF: Federico Benelli, Silvia d'Adda, Alessandro d'Autilio, Marta di Giacinto, Daniele di Giovanni, Ludovic Ouvrej, Carole Dagnacq, Juliette Vicaires, Thierry Pallet3, Pierre Rodde3, Francois Besnehard4, Laurent Gabilly4, Mireille Lardiere4, Damien Tillet5, Jean Francois Armands, Gilles Glins, Arthur Lacroix5, Vincent Curie6, Maud Spiliet6, Nicholas Handford6, Jose Ingnacio Cases7, Beatriz Vinograd. 1 SAFE 2 Department of Industrial Engineering, University of Rome Tor Vergata (Italy) 3 OUVRY 4 HCL 5 LOIMBARDI 6 B&S 7 NOVADAYS
<b>T.3-D.1-O.5</b> 03.40 p.m - 04.05 p.m.	<b>ARTIFICIAL INTELLIGENCE AND FACIAL RECOGNITION IN AN IOT ECOSYSTEM: THE IMPACT ON DATA PROTECTION AND PRIVACY AND</b> Nicola Fabiano <sup>1,2</sup> 1. Studio Legale Fabiano - Italy 2. International Institute of Informatics and Systems (IIIS), Florida, USA
<b>T.3-D.1-O.6</b> 04.05 p.m - 04.30 p.m.	<b>EUPROTECT: DEVELOPMENT OF NEW SOLUTIONS FOR THE PROTECTION OF CITIZENS AND INFRASTRUCTURES AGAINST</b> Umberto Battista <sup>1</sup> , Riccardo Quaranta <sup>2</sup> , EUProtect Project Consortium <sup>3</sup> 1) Stam S.r.l. (Italy) 2) University of Rome Tor Vergata (Italy), Department of Industrial Engineering 3) Istituto Affari Internazionali (Italy), Metro de Madrid SA (Spain), APF Ingeniería (Spain), Paulinyi & Partners Zrt. (Hungary)




Technical Table 3 (11 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Chatterjee, Prof. Illiaschenko and Dr. Battista <b>T.3 - Cybersecurity, Critical Infrastructure, IoT and AI Investigation</b>	
<b>DAY 2</b> 11 December 2020 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)	  
<b>T.3-D.2-O.4</b> 03.15 p.m - 03.40 p.m.	<b>RESIST - "rESilience Support for critical infrastructures through Standardised Training on CBRN"</b> Silvia D'Adda <sup>1</sup> , Daniele Di Giovanni <sup>2</sup> , Andrea Chierici <sup>3</sup> , RESIST STAFF RESIST Staff: Silvia d'Adda, Federico Benelli, Andrea Chierici, Daniele di Giovanni, Francesco Geriz, Paola Tessari3, Michele Manes3, Giampaolo Santini4, Vincenzo Puccias, Olivia Loredano, Giuseppe Paduano, Luigi de Dominicis6, Vasile Somoghi7, Flaviara Rotariu7, Eugenia Ghita7 1 SAFE 2 Department of Industrial Engineering, University of Rome Tor Vergata (Italy) 3 IAI (Institute for International Affairs) 4 Joint NBC Defence School 5 Italian Firefighters 6 ENEA (National Agency for New Technologies, Energy and Sustainable Economic Development) 7 PROECO
<b>T.3-D.2-O.5</b> 03.40 p.m - 04.05 p.m.	<b>EU COE PROJECT P73 - "PROTECTION OF CRITICAL INFRASTRUCTURES IN LEBANON, JORDAN AND IRAQ" - IN ITS LEBANESE COMPONENT</b> Emmanuel Bouquet <sup>1</sup> , Alessandro D'Autilio <sup>2</sup> , Omar El Samad <sup>1</sup> 1 SAFE
<b>T.3-D.2-O.6</b> 04.05 p.m - 04.30 p.m.	<b>CISINT/ISSISNA</b> Federico Sesler <sup>1</sup> , Vincenzo Iavarone <sup>1</sup> , Claudio Todaro <sup>2</sup> , Katia Petrimi <sup>2</sup> , Stefano Di Traglia <sup>2</sup> 1 Italian Center for Intelligence and Strategy (CISINT)

Technical Table 3 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Chatterjee, Prof. Illiashenko and Dr. Battista <b>T.3- Cybersecurity, Critical Infrastructure, IoT and AI Investigation</b>	
<b>DAY 1</b> 10 December 2020 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)	  
<b>T.3-D.1-O.7</b> 04:30 p.m - 04:55 p.m.	<b>CBRN EVENTS AND FULL PROTECTION OF A CRITICAL INFRASTRUCTURE</b> Francesco Geri <sup>1,2</sup> , Daniele di Giovanni <sup>2</sup> , Francesco d'Ernico <sup>3</sup> , Pasquale Gaudio <sup>3</sup> , Andrea Malizia <sup>3,4</sup> , and Andrea Chierici <sup>2,3</sup> 1. <i>Italian Civil Protection</i> 2. <i>Department of Industrial Engineering, University of Rome Tor Vergata (Italy)</i> 3. <i>Department of Industrial and Civil Engineering, University of Pisa (Italy)</i> 4. <i>Department of Biomedicine and Prevention, University of Rome Tor Vergata (Italy)</i>
<b>T.3-D.1-O.8</b> 04:55 p.m - 05:20 p.m.	<b>A SURVEY OF SECURITY GAPS IN COLLABORATIVE UNMANNED AERIAL VEHICLES</b> M.Kayalvizhi <sup>1</sup> , S.Ramamoorthy <sup>1</sup> 1. <i>Computer Science and Engineering Department, SRM University of Science and Technology, Chennai, India</i>
<b>T.3-D.1-O.9</b> 05:20 p.m - 05:45 p.m.	<b>BIG DATA FRAMEWORK WITH MACHINE LEARNING TOOLS FOR MASSIVE BIG PROGRAMS THE USAGE OF CLOUD COMPUTING</b> Anand Muni Mishra, Vinay Gautam, Prabhjot Kaur 1. <i>Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India</i>

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<b>DAY 2</b> 11 December 2020 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)	  
<b>T.3-D.2-O.7</b> 04:30 p.m - 04:55 p.m.	<b>INTERNET OF THINGS (IIOT) AND EDGE COMPUTING AS ENABLING TECHNOLOGIES OF CONTEXT AWARENESS AND HUMAN FACTORS MONITORING IN CBRN OPERATIONAL ENVIRONMENT</b> Pietro Rossetti <sup>1,2,3</sup> , Fabio Garzia <sup>4,5,6</sup> , Nicola Silverio Genco <sup>2</sup> , Antonio Sacchetti <sup>1</sup> 1. <i>Tera Srl, Conversano (BA) 70034, Italy</i> 2. <i>S.T.A.S. A. Studies Center, Rome 00137, Italy</i> 3. <i>University of Rome Tor Vergata, Rome 00173, Italy</i> 4. <i>Safety &amp; Security Engineering, DICMA - University of Rome La Sapienza, Rome 00185, Italy</i> 5. <i>Wessex Institute of Technology, Southampton SO40 7AA, UK</i> 6. <i>European Academy of Sciences and Arts, Salzburg A-5020</i>
<b>T.3-D.2-O.8</b> 04:55 p.m - 05:20 p.m.	<b>A COMPREHENSIVE BIBLIOGRAPHIC SURVEY OF THE STANDARD ROUTING PROTOCOLS IN FLYING AD HOC NETWORKS</b> Orchu Aruna <sup>1</sup> , Amit Sharma <sup>2</sup> 1. <i>Narasaraopeta Engineering College, Andhra Pradesh, India</i> 2. <i>Lovely Professional University, Punjab, India</i>
<b>T.3-D.2-O.9</b> 05:20 p.m - 05:45 p.m.	<b>IIOT BASED INDOOR AIR QUALITY MONITORING AND CONTROL SYSTEM USING RASPBERRY PI4</b> Syed Faiazuddin <sup>1</sup> , M.V. Lakshmaiah <sup>1</sup> , K. Tanveer Alam <sup>2</sup> 1. <i>Department of Electronics, S.K. University, Anantapuramu, A.P.India</i> 2. <i>Department of Electronics, Rayalaseema University, Kurnool, A.P.India</i>



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<b>DAY 1</b> 10 December 2020 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)	  
<b>T.3-D.1-O.10</b> 05.45 p.m - 06.10 p.m.	<b>CYBERTHREATS TO HOSPITALS. PANACEA: A TOOLKIT FOR CYBERSECURITY</b> Sabina Magalini <sup>1</sup> , Daniele Gui <sup>1</sup> , Pasquale Mari <sup>1</sup> , Matteo Meriardo <sup>2</sup> , Emmanouil G. Spanakis <sup>3</sup> , Rachele Brancalonei <sup>4</sup> , Vangelis Sakkalis <sup>3</sup> 1. <i>Università Cattolica del Sacro Cuore</i> 2. <i>RHEA</i> 3. <i>Foundation for Research and Technology - Institute of Computer Science</i>
<b>T.3-D.1-O.11</b> 06.10 p.m - 06.35 p.m.	<b>TRUSTWORTHINESS OF MACHINE LEARNING AND COMPUTER VISION IN GESTURE RECOGNITION</b> Anthony Jleli <sup>1</sup> 1. CCG
<b>T.3-D.1-O.12</b> 06.35 p.m - 07.00 p.m.	<b>CBRN BORDER MANAGEMENT</b> Ram Athavale <sup>2</sup> 1. <i>Department of Defence &amp; Strategic Studies (DSS), Savitribai Phule Pune University, Pune, India</i> 2. <i>Raksha Shakti University, Gandhinagar, India</i>

Technical Table 3 (11 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Chatterjee, Prof. Illiashenko and Dr. Battista <b>T.3 - Cybersecurity, Critical Infrastructure, IoT and AI Investigation</b>	
<b>DAY 2</b> 11 December 2020 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)	  
<b>T.3-D.2-O.10</b> 05.45 p.m - 06.10 p.m.	<b>AUTOMATED ARABIC TEXT CLASSIFICATION USING MULTI-AGENT SYSTEM</b> Mounir Gouiouez <sup>1</sup> 1. <i>Sidi Mohamed ben Abdellah University, Fez, Morocco</i>
<b>T.3-D.2-O.11</b> 06.10 p.m - 06.35 p.m.	<b>AUTONOMOUS ROAD SAFETY NAVIGATION SYSTEM FOR ENVIRONMENTAL HAZARDS</b> Anthony Jleli <sup>1</sup> 1. CCG
<b>T.3-D.2-O.12</b> 06.35 p.m - 07.00 p.m.	<b>REVISITING THE CYBER RISK ASSESSMENT CAPABILITY APPROACH FOR 4TH PARTY VENDORS: THE CASE OF X</b> Anthony Jleli <sup>1</sup> 1. CCG

<p>Technical Table 4 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)  Virtual Room: Archimede  Chairpersons: Prof. D'Errico, Prof. Wheldon and Prof. Gallego  <b>T.4. Radioactive and Nuclear threats</b></p>			
<p><b>DAY 1</b>  <b>10 December 2020</b>  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  		
<p>T.4-D.1-O.1</p>	<p><b>EMERGENCY MANAGEMENT EXPERIENCE WITH A GAMMA-RAY DOSIMETER FOR THE FUKUSHIMA GENERAL PUBLIC</b></p> <p>Ryoichi Suzuki<sup>1</sup>, Hiroyuki Ohguchi<sup>2</sup>, Francesco d'Errico<sup>3</sup></p> <p><sup>1</sup>National Institute of Advanced Industrial Science and Technology, Tsukuba, Ibaraki, Japan  <sup>2</sup>Chiyoda Technol Corporation, Oarai, Ibaraki, Japan  <sup>3</sup>Scuola di Ingegneria, Università di Pisa</p>		
<p>T.4-D.1-O.2</p>	<p><b>WHAT WE CAN LEARN FROM NUCLEAR EMERGENCIES?</b></p> <p>Pierre Kockertol<sup>1</sup></p> <p><sup>1. European Commission - DG Joint Research Centre (JRC)</sup></p>		
<p>T.4-D.1-O.3</p>	<p><b>PARTICIPATORY STAKEHOLDER PROCESSES AS A WAY TO STRENGTHEN THE PREPAREDNESS FOR POST-ACCIDENT MANAGEMENT AND RECOVERY</b></p> <p>M. Montero<sup>1</sup>, C. Trueba<sup>1</sup>, R. Sala<sup>1</sup>, B. García-Puerta<sup>1</sup></p> <p><sup>1. CIEMAT – Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Madrid, Spain.</sup></p>		

<p>Technical Table 4 (11 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)  Virtual Room: Archimede  Chairpersons: Prof. D'Errico, Prof. Wheldon and Prof. Gallego  <b>T.4. Radioactive and Nuclear threats</b></p>			
<p><b>DAY 2</b>  <b>11 December 2020</b>  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  		
<p>T.4-D.2-O.1</p>	<p><b>NERIS: EUROPEAN PLATFORM ON PREPAREDNESS FOR NUCLEAR AND RADIOLOGICAL EMERGENCY RESPONSE AND RECOVERY – RESEARCH CHALLENGES</b></p> <p>Eduardo Gallego<sup>1</sup>, NERIS Management Board members and NERIS R&amp;D Committee members<sup>3</sup></p> <p><sup>1. Universidad Politécnica de Madrid and Management Board of NERIS</sup>  <sup>2. <a href="https://eu-neris.net/about-neris.html">https://eu-neris.net/about-neris.html</a></sup></p>		
<p>T.4-D.2-O.2</p>	<p><b>SIMULATIONS AND CONVOLUTIONAL NEURAL NETWORKS FOR AUTOMATING RADIO-ISOTOPE IDENTIFICATION AND DEVELOPMENT OF AN ON-LINE NUCLEAR TEACHING LABORATORY – O-LAB</b></p> <p>Tzany Kokalova Wheldon<sup>1</sup>, Anthony N. Turner<sup>1</sup>, Carl Wheldon<sup>1</sup>, Angus Hollands<sup>1</sup>, Mark Griffiths<sup>1</sup>, Dawid Hampel<sup>1</sup>, Pedro Santa Rita Alcibia<sup>1</sup> and Martin Freer<sup>1</sup></p> <p>Mark R. Gilbert<sup>2</sup> and Lee Packer<sup>3</sup></p> <p>Jonathan Burns<sup>3</sup></p> <p><sup>1. School of Physics and Astronomy, University of Birmingham, Birmingham B15 2TT, UK</sup>  <sup>2. UKAEA, Culham Science Centre, Abingdon, Oxfordshire, OX14 3DB, UK</sup>  <sup>3. AME plc, Aldermaston, Reading, RG7 4PR, UK</sup></p>		
<p>T.4-D.2-O.3</p>	<p><b>TESTS AND PERFORMANCES OF A SPECIAL IDENTIFIER OF NUCLEAR THREATS AND SNM IN REALISTIC SCENARIOS</b></p> <p>Giacomo Mandragalli<sup>1</sup>, Massimo Morchi<sup>1</sup>, Matteo Corbo<sup>1</sup>, Isacco Bonesso<sup>1</sup>, Luca Stevanato<sup>2</sup></p> <p><sup>1. CAEN SpA - Spectroscopy Division - Via Vetraria, 14, 55049 Viareggio/LO</sup>  <sup>2. Padova University - Physics department - Via Francesco Marzolo, 8, 35121 Padova</sup></p>		


<p>Technical Table 4 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)  Virtual Room: Archimede  Chairpersons: Prof. D'Errico, Prof. Wheldon and Prof. Gallego  <b>T.4. Radioactive and Nuclear threats</b></p>			
<p><b>DAY 1</b>  <b>10 December 2020</b>  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  		
<p><b>T.4-D.1-O.4</b>  03.15 p.m - 03.40 p.m.</p>	<p><b>CHARACTERIZATION OF SYSTEMS FOR SPECTROMETRY MEASUREMENTS IN ENVIRONMENTAL MONITORING, SECURITY AND SAFETY APPLICATIONS</b>  Matteo Corbo<sup>1</sup>, G. Mangiagalli<sup>1</sup>, M. Morichi<sup>1</sup>, E. Fanchini<sup>1</sup>, A. Pepperosa<sup>1</sup>, F. Rogo<sup>1</sup></p> <p>1. CAEN SPA - Spectroscopy Division - Via della Vetraina, 11, 55049 Viareggio LU</p>		
<p><b>T.4-D.1-O.5</b>  03.40 p.m - 04.05 p.m.</p>	<p><b>LOW-COST RADIATION MONITORING THROUGH DRONES DURING EMERGENCIES</b>  Andrea Chierici<sup>1,2</sup>, Andrea Malizia<sup>1,3</sup>, Daniele di Giovanni<sup>1</sup>, Pasquale Gaudio<sup>1</sup> and Francesco d'Errico<sup>3</sup></p> <p>1 Department of Industrial Engineering, University of Rome Tor Vergata (Italy)  2 Department of Industrial and Civil Engineering, University of Pisa (Italy)  3 Department of Biomedicine and Prevention, University of Rome Tor Vergata (Italy)</p>		
<p><b>T.4-D.1-O.6</b>  04.05 p.m - 04.30 p.m.</p>	<p><b>SIMULATION OF A PORTABLE ACTIVE INTERROGATION SYSTEM FOR THE INTERDICTION OF SPECIAL NUCLEAR MATERIALS</b>  Anderson V. S. Alves<sup>1</sup>, Giuseppe Felici<sup>2</sup>, Francesco d'Errico<sup>1,2,3</sup></p> <p>1 Yale University, New Haven CT, USA  2 S.I.T. - Sordina IORT Technologies S.p.A., Vicenza, Italy  3 Università di Pisa, Scuola di Ingegneria, Pisa, Italy</p>		
<p><b>T.4-D.1-O.7</b>  04.30 p.m - 04.55 p.m.</p>	<p><b>SIMPLIFIED APPROACH FOR PRELIMINARY EVALUATION OF EFFECTIVE DOSE RATE FOR FIELD APPLICATIONS OF D-T NEUTRON GENERATORS</b>  Contessa G.M.<sup>1</sup>, Cherubini N.<sup>1</sup>, Gandolfo G.<sup>1</sup>, Lepore L.<sup>1</sup>, Marzo G.<sup>1</sup>, Remetti R.<sup>2</sup></p> <p>1. Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Department of Fusion and Nuclear Safety Technology, Via Enrico Fermi 45, 00044, Frascati (Rome), Italy  2. Sapienza University of Rome, Department of Basic and Applied Sciences for Engineering, Via Antonio Scarpa 14, 00161 Rome, Italy</p>		

<p>Technical Table 4 (11 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)  Virtual Room: Archimede  Chairpersons: Prof. D'Errico, Prof. Wheldon and Prof. Gallego  <b>T.4. Radioactive and Nuclear threats</b></p>			
<p><b>DAY 2</b>  <b>11 December 2020</b>  02.00 p.m - 07.00 p.m  (UTC+1 - Italian Time)</p>	  		
<p><b>T.4-D.2-O.4</b>  03.15 p.m - 03.40 p.m.</p>	<p><b>SEDEX-NRBO FIELD EXERCISE. A CRITICAL REVIEW EXERCISE OF DETECTION OF NUCLEAR AND RADIOACTIVE MATERIAL IN A POST ATTACK SCENARIO</b>  Javier Quiñones<sup>1</sup>, Benavente M<sup>1</sup>, Angeles<sup>1</sup>, Fernández Marta<sup>2</sup>, Mingorance Emiliano<sup>1</sup>, Serrano Julio<sup>1</sup>, Torres José Antonio<sup>1</sup>.</p> <p>1. Guardia Civil Interior Affairs Ministry. C/ Batalla del Salado 32. 28045 – Madrid. Kingdom of Spain  2. Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Avenida Complutense n.º 40, 28040 Madrid. Kingdom of Spain.</p>		
<p><b>T.4-D.2-O.5</b>  03.40 p.m - 04.05 p.m.</p>	<p><b>THE USE OF JRODOS DECISION SUPPORT SYSTEM IN EVALUATING THE SIZE OF EMERGENCY PLANNING ZONES OF A NUCLEAR POWER PLANT</b>  Gurdial Gokeri</p> <p>1. Hacettepe University, Nuclear Engineering Department, Turkey</p>		
<p><b>T.4-D.2-O.6</b>  04.05 p.m - 04.30 p.m.</p>	<p><b>WHAT DOES THE UME (Military Emergency Unit) CONTRIBUTE IN A NUCLEAR OR RADIOLOGICAL EMERGENCY?</b>  Antonio Nuñez Ortuño, Luis Rodríguez Álvarez de Lara</p> <p>Military Emergency Unit. Ministry of Defence. Spain</p>		
<p><b>T.4-D.2-O.7</b>  04.30 p.m - 04.55 p.m.</p>	<p><b>SMARTPHONES AS EMERGENCY PREPAREDNESS AND DISASTER RESPONSE SUPPORT DEVICES</b>  Francesco d'Errico<sup>1</sup>, Gordon A. Druker<sup>2</sup>, Andrea Chierici<sup>1</sup>, Riccardo Ciolini<sup>1</sup>, Andrea Malizia<sup>3</sup>, Raffaele Zagarella<sup>4</sup>, Eric P. Rubenstein<sup>2</sup></p> <p>1 Scuola di Ingegneria, Università di Pisa  2 Image Insight Inc., East Hartford, CT – USA  3 Scuola di Ingegneria, Università di Tor Vergata, Roma  4 Centro Interforze Studi Applicazioni Militari, San Piero a Grado, Pisa</p>		

<p>Technical Table 4 (10 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)</p> <p>Virtual Room: Archimede</p> <p>Chairpersons: Prof. D'Errico, Prof. Wheldon and Prof. Gallego</p> <p><b>T.4. Radioactive and Nuclear threats</b></p>			
<p><b>DAY 1</b></p> <p>10 December 2020</p> <p>02.00 p.m - 07.00 p.m</p> <p>(UTC+1 - Italian Time)</p>	  		
<p><b>T.4-D.1-O.8</b></p> <p>04.55 p.m - 05.20 p.m.</p>	<p><b>ENHANCED VIEWS IN EPR APPROACHES</b></p> <p>Marie Claire Cantone</p> <p>University of Milan, Via Pascal 36, 20133 Milan, Italy</p>		
<p><b>T.4-D.1-O.9</b></p> <p>05.20 p.m - 05.45 p.m.</p>	<p><b>HOW TO IMPROVE PREPAREDNESS TO EMERGENCIES AND POST-ACCIDENTAL RESPONSE? ADAPTING THE SHAMISEN RECOMMENDATIONS</b></p> <p>Ljudmila Lutsko<sup>1,3</sup>, Deborah Oughton<sup>4</sup>, Adelaïda Sarukhan<sup>1</sup> and Elisabeth Cardis<sup>1,3</sup></p> <p>1. ISGlobal – The Barcelona Institute for Global Health, Spain</p> <p>2. UPF – Universitat Pompeu Fabra, Spain</p> <p>3. CIBERESP – Consorcio de Investigación Biomédica en Red de Epidemiología y Salud Pública, Spain</p> <p>4. MIBU – Norwegian University of Life Sciences, Norway</p>		
<p><b>T.4-D.1-O.10</b></p> <p>05.45 p.m - 06.10 p.m.</p>	<p><b>STUDIES ON THE PROCESSES OF EMERGENCY RESPONSE AT THE FACILITIES OF THE ATOMIC-ENERGY COMPLEX</b></p> <p>Maksym Kustoz<sup>1</sup>, Volodymyr Kalugin<sup>1</sup></p> <p>1. National University of Civil Defence of Ukraine</p>		
<p><b>T.4-D.1-O.11</b></p> <p>06.10 p.m - 06.35 p.m.</p>	<p><b>IN VIVO PUBLIC MONITORING IN EMERGENCY EXPOSURE SCENARIOS</b></p> <p>Ignazio Vilarid<sup>1</sup>, Giuseppe Antonacci<sup>1</sup>, Paolo Battisti<sup>1</sup>, Carlo-Maria Castellani<sup>1</sup>, Luca Ciciani<sup>1</sup>, Alessandro Rizzo<sup>1</sup>, Luciano Sperandio<sup>1</sup></p> <p>1. Radiation Protection Institute, Italian Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Via Anguillarese 301, 00123 Casaccia-Rome, Italy</p>		

<p>Technical Table 4 (11 December 2020) - 02.00 p.m - 07.00 p.m (UTC+1 - Italian Time)</p> <p>Virtual Room: Archimede</p> <p>Chairpersons: Prof. D'Errico, Prof. Wheldon and Prof. Gallego</p> <p><b>T.4. Radioactive and Nuclear threats</b></p>			
<p><b>DAY 2</b></p> <p>11 December 2020</p> <p>02.00 p.m - 07.00 p.m</p> <p>(UTC+1 - Italian Time)</p>	  		
<p><b>T.4-D.2-O.8</b></p> <p>04.55 p.m - 05.20 p.m.</p>	<p><b>AN APPROACH TO COORDINATE TRANS-BOUNDARY NUCLEAR EMERGENCIES: THE EUROPEAN HERCA-WENRA APPROACH</b></p> <p>Alfredo Mozas Garcia<sup>1</sup></p> <p>1. Technical Coordinator of Emergencies. Deputy Director for Emergencies and Security. Spanish Nuclear Safety Council (CSN)</p>		
<p><b>T.4-D.2-O.9</b></p> <p>05.20 p.m - 05.45 p.m.</p>	<p><b>LARGE SCALE CONTAINMENT OF RADIOACTIVE CLOUDS</b></p> <p>Pérez Díaz José Luis<sup>1</sup>, Sánchez García-Casarrubios Juan<sup>1</sup>, Núñez Ortuño, Antonio<sup>3</sup>, Rodríguez Álvarez de Lara, Luis<sup>3</sup>, Iliev Petrov Mihayl<sup>4</sup>, Fernández Perea Gonzalo<sup>1</sup>, Ruiz (a)Universidad de Alcalá (UAH)</p> <p>(a)SAN JORGE TECNOLÓGICAS S.L. (SJ/T)</p> <p>(b)UNIDAD MILITAR DE EMERGENCIAS (UME).</p> <p>(c)MAGSOAR S.L. (MAGSOAR).</p> <p>(d)Universidad Carlos III de Madrid (UC3M)</p>		
<p><b>T.4-D.2-O.10</b></p> <p>05.45 p.m - 06.10 p.m.</p>	<p><b>FIRST RESPONDER SAFETY IN THE EVENT OF A DIRTY BOMB DETONATION IN URBAN ENVIRONMENT</b></p> <p>Sergio Biancotto<sup>1</sup>, Andrea Malizia<sup>2</sup>, Marco D'ariento<sup>3</sup>, Gian Marco Contessa<sup>3</sup></p> <p>1. Nuclear Engineer, Independent Consultant, Turin, Italy</p> <p>2. Department of Biomedicine and Prevention, University of Rome Tor Vergata</p>		
<p><b>T.4-D.2-O.11</b></p> <p>06.10 p.m - 06.35 p.m.</p>	<p><b>NEW TOOLS FOR TRAINING IN RADIOLOGICAL RISKS</b></p> <p>Beatriz Gomez-Arquello<sup>1</sup>, Borja Bravo<sup>1</sup></p> <p>1. TECNATOM</p>		
<p><b>T.4-D.2-O.12</b></p> <p>06.35 p.m - 07.00 p.m.</p>	<p><b>IN-SITU METROLOGY FOR DECOMMISSIONING NUCLEAR FACILITIES: AN OVERVIEW OF METRODECOM2 PROJECT</b></p> <p>Peter Ivanov<sup>1</sup></p> <p>1. National Physical Laboratory, UK</p>		

Technical Table 5 (10 December 2020) - 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Johnson, Col. Lopes and Col. Allert <b>T.5. CBRNe crisis and emergency management, Communication, Investigation and Forensic, Education and Training</b>	
<b>DAY 1</b> 10 December 2020 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time)	  
T.5-D.1-O.1	<b>CONSEQUENCE MANAGEMENT – A DOCTRINAL APPROACH</b>  Bernd Allert <sup>1</sup> <sup>1.</sup> Joint CBRN Defence Centre of Excellence (JCBRND COE), Vyskov/Czech Republic
T.5-D.1-O.2	<b>ITALIAN ARMY CBRN DEFENSE 7TH CBRN DEFENSE REGIMENT: ROLE, CAPABILITIES AND OPERATIONS.</b>  Federico Ceccaroli <sup>1</sup> , Daniele Del Gaudio <sup>1</sup> <sup>1.</sup> Esercito Italiano, Largo Acquaroni n. 24, Civitavecchia (Rome) 00053, Italy
T.5-D.1-O.3	<b>PROACTIVE PROJECT</b>  Dominic Kelly <sup>1</sup> <sup>1.</sup> CBRNe Ltd
T.5-D.1-O.4	<b>CBRN INSTRUCTOR</b> Joelle Khadra <sup>1</sup> , Adolph Eid <sup>1</sup> and Ioannis Galatas <sup>1</sup> <i>Independent CBRNe expert</i>
T.5-D.1-O.5	<b>NOTICE - EUROPEAN NETWORK OF CBRN TRAINING CENTERS</b>  Olga Vybormova <sup>1</sup> , Jean-Luc Gala <sup>1</sup> <sup>1.</sup> Centre for Applied Molecular Technologies of Université catholique de Louvain (UCL-CTMA)

Technical Table 5 (11 December 2020) - 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Johnson, Col. Lopes and Col. Allert <b>T.5. CBRNe crisis and emergency management, Communication, Investigation and Forensic, Education and Training</b>	
<b>DAY 2</b> 11 December 2020 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time)	  
T.5-D.2-O.1	<b>OPTIMISING COUNTER CBRN TRAINING AND EDUCATION</b>  Steve Johnson <sup>1</sup> , George Burke <sup>1</sup> , Keith Bullock <sup>1</sup> , Robert Elms <sup>1</sup> <sup>1.</sup> U.K. British Army, less Steve who is Cranfield university
T.5-D.2-O.2	<b>ABU DHABI POLICE PROCEDURES IN COVID-19 CORONAVIRUS DISASTER AND IMPORTANCE OF USED SMART TECHNOLOGY</b>  Abdullah Ali Ahmad Althumoudi <sup>1</sup> <sup>1.</sup> Abu Dhabi Police GHQ, United Arab Emirates
T.5-D.2-O.3	<b>SERIOUS GAME DEVELOPMENT FOR CBRNE TRAINING: A COMPARATIVE ANALYSIS IN VIRTUAL REALITY AND COMPUTER-BASED ENVIRONMENTS</b>  Burak Altan <sup>1</sup> , Servet Gurer <sup>2</sup> , Ali Alsamari <sup>3</sup> , Damla Kivilicim Demir <sup>3</sup> , H. Sebnem Duzgun <sup>4</sup> , Mustafa Erkayaoglu <sup>3</sup> , Elif Surel <sup>3</sup> <sup>1.</sup> Department of Modeling and Simulation, Graduate School of Informatics, Middle East Technical University, Ankara, 06800, Turkey <sup>2.</sup> Department of Mining Engineering, Middle East Technical University, 06800 Ankara, Turkey <sup>3.</sup> Department of Industrial Design, Middle East Technical University, 06800 Ankara, Turkey <sup>4.</sup> Mining Engineering Department, Colorado School of Mines, Brown Hall 268, CO 80401, USA
T.5-D.2-O.4	<b>ITALIAN FIRE AND RESCUE SERVICE ROLE IN THE PANDEMIC EMERGENCY – THE SECOND PHASE</b>  Luca Rosiello <sup>1</sup> <sup>1.</sup> Italian Fire and Rescue Service – Central Directorate for Emergency (Italy)
T.5-D.2-O.5	<b>THE EFFECTIVENESS OF TABLE TOP EXERCISES IN IMPROVING PANDEMIC CRISIS PREPAREDNESS</b>  Michael Ian Thornton <sup>1</sup> , Colomba Russo <sup>2</sup> and Alba Iannotti <sup>1,2</sup> <sup>1.</sup> INAC, HESAR Association, University of Rome Tor Vergata <sup>2.</sup> Department of Industrial Engineering, University of Rome Tor Vergata

Technical Table 5 (10 December 2020) - 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Johnson, Col. Lopes and Col. Allert <b>T.5- CBRNe crisis and emergency management, Communication, Investigation and Forensic, Education and Training</b>		Technical Table 5 (11 December 2020) - 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Johnson, Col. Lopes and Col. Allert <b>T.5- CBRNe crisis and emergency management, Communication, Investigation and Forensic, Education and Training</b>	
<b>DAY 1</b> 10 December 2020 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time)	  	<b>DAY 2</b> 11 December 2020 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T.5-D.1-O.6</b> 10.25 a.m. - 10.50 a.m.	<b>DNA RESISTANCE TO RADIATION FIELD. FORENSIC GENOTYPING IN A RADIOLOGICAL INCIDENT SCENARIO</b> Quiñones Javier <sup>1</sup> , Fernández Marta <sup>2</sup> , Mingorance Emiliano <sup>1</sup> , Serrano Julio <sup>1</sup> , Torres José Antonio <sup>1</sup> , Cobos José Manuel <sup>2</sup> , Amigo Luis Jesus <sup>2</sup> 1. Guardia Civil. Interior Affairs Ministry. C/ Batalla del Salado, 32. 28045 – Madrid. Kingdom of Spain. 2. CIEMAT. Avda. Complutense 40, 28040 – Madrid. Kingdom of Spain	<b>RISK ASSESSMENT, CHALLENGES, APPLICATIONS, THEORIES: A CASE STUDY FROM THE UNITED ARAB EMIRATES (UAE)</b> Ibrahim Almatrouqi <sup>1</sup> 1. The United Arab Emirates Abu Dhabi Police	<b>RISK ASSESSMENT, CHALLENGES, APPLICATIONS, THEORIES: A CASE STUDY FROM THE UNITED ARAB EMIRATES (UAE)</b>
<b>T.5-D.1-O.7</b> 10.50 a.m. - 11.15 a.m.	<b>THE CBRN THREAT IN 21<sup>ST</sup> CENTURY - COUNTER THE PROLIFERATION OF WMD IN MARITIME DOMAIN</b> Fabio Polidoro <sup>1</sup> 1. ITALIAN NAVY GENERAL STAFF, 7 <sup>th</sup> DEPARTMENT "NAVAL SEA SYSTEM" – Damage Control & CBRN Officer	<b>REUSE: BIO-DECONTAMINATION OF FILTERING FACE PIECE RESPIRATORS AND MASKS FOR REUSE PROJECT DISSEMINATION</b> Wilson Antunes <sup>1</sup> ; Ricardo Vieira <sup>1</sup> ; José Borges <sup>1</sup> ; David Pêra <sup>1</sup> ; Ivo Costa <sup>1</sup> ; Fernando Antunes <sup>2</sup> ; João Silva <sup>3</sup> ; Fadhil Musa <sup>3</sup> ; Raquel Nogueira <sup>3</sup> ; Luis Costa <sup>4</sup> ; Paulo Cruz <sup>5</sup> <sup>1</sup> Centro de Investigação da Academia Militar (CINAMIL), Unidade Militar Laboratorial de Defesa Biológica e Química (UMLDBQ), Av. Dr. Alfredo Bensaúde, 1849-012 Lisboa, Portugal; <sup>2</sup> Centro de Química Estrutural, Faculdade de Ciências, Universidade de Lisboa, Campo Grande, 1749-016 Lisboa, Portugal; <sup>3</sup> Deiox, Tec Labs, Campus da FCUL Campo Grande 1749-016 Lisboa, Portugal; <sup>4</sup> Fardas 3B, Rua António Macedo, 20 2840-175 Seixal, Portugal; <sup>5</sup> Hospital das Forças Armadas, Azinhaga dos Ulmeiros, 1649-020 Lisboa, Portugal.	<b>REUSE: BIO-DECONTAMINATION OF FILTERING FACE PIECE RESPIRATORS AND MASKS FOR REUSE PROJECT DISSEMINATION</b>
<b>T.5-D.1-O.8</b> 11.15 a.m. - 11.40 a.m.	<b>HEART RATE VARIABILITY AS A PREDICTIVE TOOL IN SQUAD READINESS AND SAFETY</b> Rui Jorge Pailhoto Lucen <sup>1</sup> 1. Tenente Coronel de Cavalaria, AM SEDE Rua Gomes Freire1169-203 Lisboa, PORTUGAL	<b>COUNTERFOG SYSTEM APPLIED INSIDE THE WAREHOUSE. VERIFICATION OF THE COUNTER RESPONSE AGAINST RADIOCHEMICAL ATTACK SCENARIO</b> Quiñones Javier <sup>1</sup> , Dominguez Jose Antonio <sup>2</sup> , Pascual Laura <sup>2</sup> , Amigo Luis Jesus <sup>2</sup> , Cobo Jose Manuel <sup>1</sup> , Fernández Marta <sup>1</sup> 1. Guardia Civil. Interior Affairs Ministry. C/ Batalla del Salado, 32. 28045 – Madrid. Kingdom of Spain 2. Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Avenida Complutense nº 40, 28040 Madrid. Kingdom of Spain.	<b>COUNTERFOG SYSTEM APPLIED INSIDE THE WAREHOUSE. VERIFICATION OF THE COUNTER RESPONSE AGAINST RADIOCHEMICAL ATTACK SCENARIO</b>

Technical Table 5 (10 December 2020) - 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Johnson, Col. Lopes and Col. Allert <b>T.5- CBRNe crisis and emergency management, Communication, Investigation and Forensic, Education and Training</b>	
<b>DAY 1</b> 10 December 2020 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T.5-D.1-O.9</b> 11.40 a.m. - 12.05 a.m.	<p>A PUBLIC SURVEY ON A SAMPLE OF ITALIAN POPULATION DURING COVID19 LOCKDOWN WITH ANALYSIS OF PERCEPTION OF THE EMERGENCY: COMMUNICATION, FAKE NEWS CIRCULATING, WORK OF HEALTH AND SECURITY PERSONNEL AND CENTRAL AND LOCAL GOVERNMENT</p> <p>Simone Nicolai<sup>1</sup>, Ahmed Gamal Ibrahim<sup>2</sup>, Andrea Malizia<sup>3</sup>, Alba Iannotti<sup>4,5</sup></p> <ol style="list-style-type: none"> <li>1. CREA-IT and UNITO VM/Master CBRNe</li> <li>2. CBRN Academy</li> <li>3. Department of Biomedicine and Prevention, University of Rome Tor Vergata</li> <li>4. Department of Industrial Engineering, University of Rome Tor Vergata</li> <li>5.</li> </ol>
<b>T.5-D.1-O.10</b> 12.05 a.m. - 12.30 a.m.	<p>COMPLEX EMERGENCY MANAGEMENT IN INTERNATIONAL CONTEXT</p> <p>Stefania Fiore<sup>1</sup></p> <ol style="list-style-type: none"> <li>1. Italian Fire and Rescue Service – Central Directorate for Emergency (Italy)</li> </ol>
<b>T.5-D.1-O.11</b> 12.30 a.m. - 12.55 a.m.	<p>THE DEPLOYMENT OF THE IT-CBRN TEAM IN LEBANON AFTER BEIRUT BLAST</p> <p>Stefania Fiore<sup>1</sup></p> <ol style="list-style-type: none"> <li>1. Italian Fire and Rescue Service – Central Directorate for Emergency (Italy)</li> </ol>
<b>T.5-D.1-O.12</b> 12.55 a.m. - 01.20 p.m.	<p>COUNTER-MINIMICRO UAS PERSPECTIVE: SAFEGUARDING TROOPS AND INSTALLATIONS</p> <p>Giorgio Cozzolino<sup>1</sup>, Savino Sculamieri<sup>2</sup></p> <ol style="list-style-type: none"> <li>1. Colonel, Director of the Center of Excellence Counter M/M UAS</li> <li>2. Major, Plans Section Chief of the Center of Excellence Counter M/M UAS</li> </ol>

Technical Table 5 (11 December 2020) - 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time) Virtual Room: Galileo Chairpersons: Prof. Johnson, Col. Lopes and Col. Allert <b>T.5- CBRNe crisis and emergency management, Communication, Investigation and Forensic, Education and Training</b>	
<b>DAY 2</b> 11 December 2020 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T.5-D.2-O.9</b> 11.40 a.m. - 12.05 a.m.	<p>ANALYSIS OF CORONA VIRUS OUTBREAK IN CHINA: CRISIS COMMUNICATION CHALLENGES AND LESSONS FOR A SAFE FUTURE</p> <p>Muhammad Usman Asghar<sup>1</sup>, Suman Choudary<sup>2</sup></p> <ol style="list-style-type: none"> <li>1. Department of Government and Public Policy, National Defence University, Islamabad, 44000, Pakistan.</li> <li>2. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</li> </ol>
<b>T.5-D.2-O.10</b> 12.05 a.m. - 12.30 a.m.	<p>MANAGEMENT OF TECHNICAL EMERGENCY RESCUE AND OF BIOLOGICAL RISKS IN THE COVID-19 ERA</p> <p>Edoardo Cavaleri d'Oro<sup>1</sup></p> <ol style="list-style-type: none"> <li>1. Italian Fire and Rescue Services – Advanced Regional CBRN Unit of the Lombardy Region - Milan (Italy)</li> </ol>
<b>T.5-D.2-O.11</b> 12.30 a.m. - 12.55 a.m.	<p>ROLE AND TASKS OF THE NATIONAL ARMAMENTS DIRECTORATE LAND ARMAMENT DIRECTORATE (DAT). CBRN AS A DEAL: TECHNICAL CHALLENGES AND INVOLVEMENTS</p> <p>Salvatore Masi<sup>1</sup></p> <ol style="list-style-type: none"> <li>1. Brig. Gen. National Armaments Directorate Land Armament Directorate (DAT), Italian Ministry of Defence (Italy)</li> </ol>
<b>T.5-D.2-O.12</b> 12.55 a.m. - 01.20 p.m.	<p>CBRNE TRAINING IN VIRTUAL ENVIRONMENTS – STRUCTURED ANALYSIS &amp; PRACTICAL GUIDELINES</p> <p>Markus Mürtinger<sup>1,2</sup></p> <ol style="list-style-type: none"> <li>1. USECON – The Usability Consultants (Austria)</li> <li>2. AIT Austrian Institute of Technology (Austria)</li> </ol>




<p>Technical Table 6 (10 December 2020) - 08.20 a.m. - 01.00 p.m. (UTC+1 - Italian Time)  Virtual Room Archimede  Chairpersons: Dr. Trapp, Cpt. Kwon and Prof. Morea  <b>T. 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science</b></p>	
<p><b>DAY 1</b>  10 December 2020  08.20 a.m. - 01.00 p.m.  (UTC+1 - Italian Time)</p>	  
<p><b>T. 6-D.1-O.1</b>  08.20 a.m. - 08.45 a.m.</p>	<p><b>RESPONDING TO CHEMICAL-WEAPONS TREATS: AN OPCW VIEW</b></p> <p>Joseph Ballard<sup>1</sup>  1. Senior Policy Adviser, Office of Strategy and Policy, Organisation for the Prohibition of Chemical Weapons</p>
<p><b>T. 6-D.1-O.2</b>  08.45 a.m. - 09.10 a.m.</p>	<p><b>HOW REAL IS THE THREAT OF TERRORIST USE OF WEAPONS OF MASS DESTRUCTION?</b></p> <p>Chalaris Michail<sup>1</sup>  1. International Hellenic University, Department of Chemistry (Kavala) – Hellenic Fire Academy, School of Fire Officers, Military Nursing Academy (SAN), Hellenic Fire Corps, Greece.</p>
<p><b>T. 6-D.1-O.3</b>  09.10 a.m. - 09.35 a.m.</p>	<p><b>WHAT ROLE FOR THE UNITED NATIONS AND OTHER RELEVANT INTERNATIONAL ORGANIZATIONS IN CASE OF A REQUEST FOR ASSISTANCE PURSUANT TO ARTICLE VII OF THE BWC IN CASE OF USE OF BIOLOGICAL WEAPONS?</b></p> <p>Valeria Santori<sup>1</sup>  1. Implementation Support Branch (ISU) for the Biological Weapons Convention (BWC) in the United Nations Office for Disarmament Affairs (UNODA - Geneva Branch)</p>
<p><b>T. 6-D.1-O.4</b>  09.35 a.m. - 10.00 a.m.</p>	<p><b>WEAPONS OF MASS DESTRUCTION AND THEIR PROHIBITION</b></p> <p>Claude Lefebvre<sup>1</sup>, Weisberg Guillaume<sup>1</sup>  1. Independent co-authors</p>

<p>Technical Table 6 (11 December 2020) - 08.20 a.m. - 01.00 p.m. (UTC+1 - Italian Time)  Virtual Room Archimede  Chairpersons: Dr. Trapp, Cpt. Kwon and Prof. Morea  <b>T. 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science</b></p>	
<p><b>DAY 2</b>  11 December 2020  08.20 a.m. - 01.00 p.m.  (UTC+1 - Italian Time)</p>	  
<p><b>T. 6-D.2-O.1</b>  08.20 a.m. - 08.45 a.m.</p>	<p><b>NON-STATE ACTORS, CHEMICAL WEAPONS, AND THE CHEMICAL WEAPONS CONVENTION</b></p> <p>Ralf Trapp<sup>1</sup>  1. Independent International Disarmament Consultant</p>
<p><b>T. 6-D.2-O.2</b>  08.45 a.m. - 09.10 a.m.</p>	<p><b>SMALL SATELLITES CONSTELLATIONS AND THEIR IMPACT ON CBRNE MANAGEMENT IN AFRICA</b></p> <p>Donato Morea<sup>1</sup>, Giacomo Primo Sciortino<sup>2,3</sup>  1. Faculty of Economics, Universit�as Mercatorum, Rome, Italy.  2. Pegaso University, Naples, Italy.  3. Shortman Consultants, Rome, Italy.</p>
<p><b>T. 6-D.2-O.3</b>  09.10 a.m. - 09.35 a.m.</p>	<p><b>NEW FRONTIER OF AIRBORNE REAL-TIME MONITORING OF VOLATILE COMPOUNDS</b></p> <p>Gaetano Carminat<sup>1</sup>, Brais Vazquez Iglesias<sup>2</sup>  1. Head of Technical Operational Unit, Ministry of Foreign Affairs and International Cooperation, Direction of Politics and Security General Affairs, Italian National Authority for the Implementation of the Chemical Weapons Convention  2. Pollution srl.</p>
<p><b>T. 6-D.2-O.4</b>  09.35 a.m. - 10.00 a.m.</p>	<p><b>LEAN THINKING APPROACH IN CRISIS SCENARIOS: MANAGING A CBRNE EMERGENCY IN A LAW ENFORCEMENT DEPARTMENT BY MEANS OF</b></p> <p>Claudio Guidotti (1), Damiano Ricci (2)  (1) Central Anticrimine Directorate of Italian Police, Forensic Science Police Service, Regional Forensic Unit "Toscana", Firenze, Italy.  (2) Central Anticrimine Directorate of Italian Police, Forensic Science Police Service, Rome, Italy.</p>



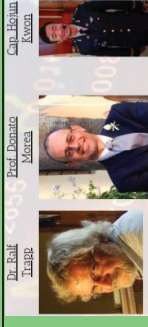
Technical Table 6 (10 December 2020) - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room Archimede Chairpersons: Dr. Trapp, Cpt. Kwon and Prof. Morea <b>T. 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science</b>	
<b>DAY 1</b> 10 December 2020 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T. 6-D.1-O.5</b> 10.00 a.m. - 10.25 a.m.	<b>ISTITUTO AFFARI INTERNAZIONALI: THE ROLE OF A THINK TANK IN THE FIELD OF CBRN</b> Paola Tessari <sup>1</sup> 1. Istituto Affari Internazionali (IAI)
<b>T. 6-D.1-O.6</b> 10.25 a.m. - 10.50 a.m.	<b>BIOLOGICAL TRANSMITTABLE DISEASES IN AVIATION (AIRPLANES AND AIRPORTS): A RISK OR HOAX?</b> Patrick Wengler <sup>1</sup> International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy
<b>T. 6-D.1-O.7</b> 10.50 a.m. - 11.15 a.m.	<b>INDUSTRIAL RISK AS BURDEN ON WORKERS POPULATION: INCIDENCE RATES OF NUCLEAR/RADIOLOGICAL OCCUPATIONAL DISEASES ACROSS</b> Ciccarella Modica D. <sup>1</sup> , Chatzichristou P. <sup>1</sup> , Mancinelli S. <sup>2</sup> , Mossaico F. <sup>1</sup> , Vinci A. <sup>1</sup> , Parrinello C. <sup>1</sup> , Silvestri G.M. <sup>1</sup> , Palombi L. <sup>2</sup> 1. School of Specialization in Hygiene and Preventive Medicine, Tor Vergata University of Rome 2. Department of Biomedicine and Prevention, Tor Vergata University of Rome

Technical Table 6 (11 December 2020) - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room Archimede Chairpersons: Dr. Trapp, Cpt. Kwon and Prof. Morea <b>T. 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science</b>	
<b>DAY 2</b> 11 December 2020 08.20 a.m - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T. 6-D.2-O.5</b> 10.00 a.m. - 10.25 a.m.	<b>INTRODUCTION OF COUNTER TERRORISM SYSTEM IN REPUBLIC OF KOREA : THE ONLY DIVIDED COUNTRY IN THE WORLD</b> Hojun Kwon <sup>1,2</sup> 1. Captain of Republic of Korea Army. 2. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy
<b>T. 6-D.2-O.6</b> 10.25 a.m. - 10.50 a.m.	<b>ITALIAN MILITARY CBRN EDUCATIONAL AND TRAINING CAPABILITIES</b> Giampaolo Santini <sup>1</sup> 1. Maj. NBC School of Rieti, Italian Ministry of Defence (Italy)
<b>T. 6-D.2-O.7</b> 10.50 a.m. - 11.15 a.m.	<b>PREPAREDNESS AND RESPONSE FOR A NUCLEAR OR RADIOLOGICAL EMERGENCY: ANALYSIS OF IAEA'S SAFETY REQUIREMENTS AND GUIDES</b> Andrea Micocci 1. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy

Technical Table 6 (10 December 2020) - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room Archimede Chairpersons: Dr. Trapp, Cpt. Kwon and Prof. Morea <b>T. 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science</b>	
<b>DAY 1</b> 10 December 2020 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T. 6-D.1-O.8</b> 11.15 a.m. - 11.40 a.m.	<b>FAST SURFACE DISINFECTION WITH COUNTERFOG SDR-FoSA+</b> Pérez Díaz, José Luis <sup>1</sup> ; Sánchez García-Casarrubios, Juan <sup>2</sup> ; Méndez-Vigo Carranza, Pablo <sup>3</sup> ; Ruiz Navas Elisa María <sup>4</sup> ; Iliev Petrov, Mihayl <sup>5</sup> ; Martín Pérez, Tania <sup>6</sup> ; Alcamí, Antonio <sup>6</sup> ; Vázquez, Ángela <sup>6</sup> ; Rastrojo, Alberto <sup>6</sup> ; Fernández Perea, Gonzalo <sup>7</sup> ; Victor Archilla <sup>8</sup> and María Sánchez-García <sup>6</sup> 1. <i>Universidad de Alcalá (UAH)</i> 2. <i>SAN JORGE TECNOLÓGICAS S.L. (SIT)</i> 4. <i>COUNTERFOG EBT DELA UAH S.L. (COUNTERFOG)</i> 5. <i>Universidad Carlos III de Madrid (UC3M)</i> 6. <i>MAG SOARS S.L. (MAGSOAR)</i> 7. <i>Centro de Biología Molecular Severo Ochoa. CSIC. UAM.</i> 8. <i>Instrumentation and experimental measurement techniques laboratory // Energy and Environmental Area INTA (National Institute of Aerospace Technology), Ctra Torrejón Ardoz, Spain</i>
<b>T. 6-D.1-O.9</b> 11.40 a.m. - 12.05 a.m.	<b>RISKS AND SAFETY MEASURES ASSOCIATED WITH THE STORAGE AND TRANSPORT OF LNG*</b> Luigi Palestini <sup>1</sup> , Fabio Sessu <sup>1</sup> 1. <i>International Master Courses in Protection Against CBRNe events</i>

Technical Table 6 (11 December 2020) - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room Archimede Chairpersons: Dr. Trapp, Cpt. Kwon and Prof. Morea <b>T. 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science</b>	
<b>DAY 2</b> 11 December 2020 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time)	  
<b>T. 6-D.2-O.8</b> 11.15 a.m. - 11.40 a.m.	<b>CBRNE VETERINARY: ANIMAL MANAGEMENT IN DISASTER</b> Luca Zelinotti <sup>1</sup> ; Marco Serale <sup>2</sup> ; Botti Lorenzo <sup>3</sup> ; Cardamone Rocco <sup>4</sup> ; Petrelli Guido <sup>5</sup> ; Francesco Geri <sup>6</sup> ; Leonardi Marco <sup>7</sup> ; Terzilli Dania <sup>5</sup> ; Vinci Antonio <sup>9</sup> ; Monti Manuel <sup>10</sup> ; Rosiello Francesco <sup>11</sup> 1. <i>Emergency Management</i> 2. <i>ASL Cuneo 1</i> 3. <i>Vigili del Fuoco</i> 4. <i>Polizia di Stato</i> 5. <i>Italian military Red Cross</i> 6. <i>Protezione civile</i> 7. <i>Protezione civile</i> 8. <i>Independent</i> 9. <i>Università degli Studi di Roma "Tor Vergata"</i> 10. <i>USL Umbria 1</i> 11. <i>Sapienza University of Rome</i>
<b>T. 6-D.2-O.9</b> 11.40 a.m. - 12.05 a.m.	<b>THE TEAM LEADER'S DECISION - BETWEEN THE LAW AND OPERATIONAL REQUIREMENTS</b> Carol Peterfi <sup>1</sup> 1. <i>OPCW Organization for the Prohibition of the Chemical Weapons (OPCW), The Hague, (NETHERLANDS)</i>

Technical Table 6 (10 December 2020) - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room Archimede Chairpersons: Dr. Trapp, Cpt. Kwon and Prof. Morea <b>T. 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science</b>	
<b>DAY 1</b> 10 December 2020 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time)	
<b>T. 6-D. 1-O.10</b> 12.05 a.m. - 12.30 a.m.	<b>LOOKING AT THE ARMAGEDDON FROM THE KITCHEN WINDOW</b>  Massimo Pedemonte <sup>1</sup> <i>1. Italian Police Bomb Squad Commander (Ret.)</i>
<b>T. 6-D. 1-O.11</b> 12.30 a.m. - 12.55 a.m.	<b>BEIRUT PORT EXPLOSION: POST-BLAST MANAGEMENT OPERATIONS</b>  Andrea Gloria <sup>1</sup> <i>1. Ten. Col. Italian Army, EU funded project "Technical Assistance on CBRN Risks Mitigation in Lebanon"</i>

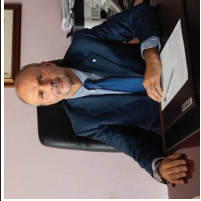



Technical Table 6 (11 December 2020) - 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time) Virtual Room Archimede Chairpersons: Dr. Trapp, Cpt. Kwon and Prof. Morea <b>T. 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science</b>	
<b>DAY 2</b> 11 December 2020 08.20 a.m. - 01.00 p.m (UTC+1 - Italian Time)	
<b>T. 6-D. 2-O.10</b> 12.05 a.m. - 12.30 a.m.	<b>THE ITALIAN AIR FORCE OPERATIONAL LOGISTICS AT THE TIME OF COVID-19</b>  Luongo Giovanni <sup>1</sup> <i>1. Colonel, Commander 3rd Wing Italian Air Force, Villafranca di Verona, Via Caluri (Verona), Italy</i>
<b>T. 6-D. 2-O.11</b> 12.30 a.m. - 12.55 a.m.	<b>COVID-19 PANDEMIC. THE ITALIAN AIR FORCE PERSPECTIVE</b>  Alberto Autore <sup>1</sup> <i>1. Colonel, Commander of Air Base Clinic, Pratica di Mare Airport, Via Pratica di Mare, Pomezia (Roma), Italy</i>

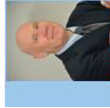
**PLENARY SESSION 1**  
 11 December 2020 - 08.30 a.m. - 03.00 p.m. (UTC+1 - Italian Time)  
 Virtual Room: AUDITORIUM  
 Chairpersons  
 Dr. Michael Ian Thornton  
 Dr. Andrea Melizza

**SICC**  
 10-12 December 2020  
 Rome - ITALY  
 Epidemiology, biological threats and radiological events  
 The importance of interdisciplinary approaches to Countermeasures Research  
 Cooperation

**08.30 a.m. - 09.00 a.m.**

**Opening Welcome**

<p><b>Prof. Orazio Schillaci</b></p> 	<p><i>Rector of the University of Rome Tor Vergata (Italy)</i></p>
<p><b>Prof. Loredana Santo</b></p> 	<p><i>Director of the Department of Industrial Engineering, University of Rome Tor Vergata (Italy)</i></p>
<p><b>Prof. Antonino De Lorenzo</b></p> 	<p><i>Director of the Department of Biomedicine and Prevention, University of Rome Tor Vergata (Italy)</i></p>
<p><b>Prof. Pasquale Gaudio</b></p> 	<p><i>Coordinator of the International Master Courses in Protection Against CBRNe events, University of Rome Tor Vergata (Italy)</i></p>



Dr. Michael Ian Thornton

### PLENARY SESSION 1

12 December 2020 - 08:30 a.m. - 01:00 p.m. (UTC+1 - Italian Time)

Virtual Room: AUDITORIUM

Chairpersons



Dr. Andrea Malizia



<b>09.00 a.m. - 09.40 a.m.   Oral Session</b>	
<b>P1.O1</b>  09.00 a.m. - 09.20 a.m.	<b>Prof. Tony Hooker</b>  <i>Centre for Radiation Research, Education and Innovation  University of Adelaide  (AUSTRALIA)</i>
	<b>EMERGENCY PREPAREDNESS AND RESPONSE TRAINING: A SOUTH AUSTRALIAN PERSPECTIVE</b>
<b>P1.O2</b>  09.20 a.m. - 09.40 a.m.	<b>Prof. Nakahiro Yasuda</b>  <i>The Research Institute of Nuclear Engineering  University of Fukui  (JAPAN)</i>
	<b>A NEW EMERGENCY RESPONSE EDUCATION CURRICULUM: FROM THE EXPERIENCES AND LESSONS LEARNED FROM THE TEPCO FUKUSHIMA DAIICHI NUCLEAR POWER PLANT ACCIDENT</b>



Dr. Michael Im Thornton

**PLENARY SESSION 1**

12 December 2020 - 08.30 a.m. - 01.00 p.m (UTC+1 - Italian Time)

Virtual Room: AUDITORIUM


Chairpersons





Dr. Andrea Malizia





**09.40 a.m. - 12.00 a.m.**  
**Round Table** - Presentation of the new cooperation agreements with the University of Rome Tor Vergata in the aim of the CBRNE activities: education, training and research

<p><b>LECTIO MAGISTRALIS</b></p>	<p><b>Prof. Dr. rer. nat. Thomas DEKORSY</b></p> 	<p><b>LASER BASED CBE STAND-OFF DETECTION AND THE NEW COOPERATION OF GERMAN AEROSPACE CENTER (DLR) WITH THE UNIVERSITY OF ROME TOR VERGATA IN THE AIM OF CBRNE RESEARCH, DIDACTIC AND TRAINING</b></p>
<p>09.40 a.m. - 10.10 a.m.</p>	<p><i>Director of the Institute of Technical Physics German Aerospace Center (DLR) (GERMANY)</i></p>	





<p><b>P1.04</b></p>	<p><b>Lt.Col. Tiago Manuel Batista Lopes</b></p> 	<p><b>THE FIRST RESPONDERS ROLES DURING NATIONAL AND INTERNATIONAL CBRNE EMERGENCIES</b></p>
<p>10.10 a.m. - 10.30 a.m.</p>	<p><i>Commander of the Firefighters Regiment of Lisbon Regimento De Sapadores Bombeiros (PORTUGAL)</i></p>	

<p><b>P1.05</b></p>	<p><b>Sen. Vincenzo D'Anna</b></p> 	<p><b>BIO-THREATS AND RISKS RELATED TO BIO-CONTAMINATION: AN ALL HAZARDS APPROACH TO IMPROVE THE SAFETY FACTORS</b></p>
<p>10.30 a.m. - 10.40 a.m.</p>	<p><i>President of National Order of Biologist (ITALY)</i></p>	
<p>10.40 a.m. - 10.50 a.m.</p>	<p><b>BREAK</b></p>	

**PLENARY SESSION 1**  
 11 December 2020 - 08:30 a.m. - 01:00 p.m. (UTC+1 - Italian Time)  
 Virtual Room: AUDITORIUM  
 Chairpersons  
 Dr. Michael Ian Thornton  
 Dr. Andrea Malizia



Epidemics, biological threats and radiological events  
 10-12 December 2020  
 Cooperation  
 International Centre for Public Health  
 Rome - ITALY

<p><b>P1.06</b></p> <p>10.50 a.m. - 11.10 a.m.</p>	<p><b>Dr. Ramon De La Vega</b></p>  <p><i>International Atomic Energy Agency (IAEA)          Vienna International Centre, Vienna          (AUSTRIA)</i></p>	<p><b>IAEA GUIDANCE ON RADIOLOGICAL AND NUCLEAR EMERGENCIES IRRESPECTIVE OF ITS CAUSE, SAFETY OR SECURITY RELATED. CURRENT CHALLENGES AND WAY FORWARD</b></p>
<p><b>P1.07</b></p> <p>11.20 a.m. - 11.35 a.m.</p>	<p><b>Dr. Colomba Russo</b></p>  <p><i>HESAR Association, CBRNe Master Courses          (University of Rome Tor Vergata)          (ITALY)</i></p>	<p><b>THE ROLE OF HESAR IN THE CBRNe INTERNATIONAL MASTER COURSES IN PROTECTION AGAINST CBRNe EVENTS</b></p>
<p><b>P1.08</b></p> <p>11.20 a.m. - 11.35 a.m.</p>	<p><b>Dr. Michael Ian Thornton</b></p>  <p><i>INAC Association          (ITALY)</i></p>	<p><b>TABLE TOP EXERCISES: THE EMERGENCY SIMULATIONS TO IMPROVE THE LEVEL OF EXPERTISE FOR THE CBRNe OPERATORS</b></p>
<p><b>P1.09</b></p> <p>11.35 a.m. - 11.55 a.m.</p>	<p><b>Prof. Amer Hosin</b></p>  <p><i>Abu Dhabi Police          (UNITED ARAB EMIRATES)</i></p>	<p><b>THE LINK BETWEEN ABU DHABI POLICE AND THE UNIVERSITY OF ROME TOR VERGATA FOR THE MAXI-EMERGENCIES EDUCATION, TRAINING AND RESEARCH</b></p>

**PLENARY SESSION 1**  
 11 December 2020 - 08:30 a.m. - 03:00 p.m. (UTC+1 - Italian Time)  
 Virtual Room: AUDITORIUM  
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Epidemics, biological threats and radiological events  
 The importance of interdisciplinary approaches to Cooperation, Research  
 10-12 December 2020  
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<b>11.55 a.m. - 12.40 p.m.</b>		<b>Oral Session</b>	
<b>P1.O10</b>	<b>BMD spa</b>  PLATINUM Sponsor	<b>NEW TECHNOLOGIES FOR CBRNe DETECTION and IDENTIFICATION</b>	
<b>P1.O11</b>	<b>WL GORE &amp; ASSOCIATI</b>  Gold Sponsor	<b>NEW TECHNOLOGIES FOR INDIVIDUAL CBRNe PROTECTION</b>	
	12.00 p.m. - 12.30 p.m.		12.30 p.m. - 12.50 p.m.



**PLENARY SESSION 2**  
 12 December 2020 - 01.50 p.m. - 04.00 p.m. (UTC+1 - Italian Time)  
 Virtual Room: AUDITORIUM  
 Chairpersons  
 **Dr. Dieter Rothbacher**  
 **Dr. Andrea Malizia**

**SICC**  
 2020  
 10-12 December 2020  
 Rome - ITALY  
 The importance of multidisciplinary approaches in Chemical, Biological, Radiological and Nuclear Research  
 Epidemics, biological threats and radiological events



01.50 p.m. - 03.50 p.m.		<b>Oral Session</b>	
P2.01	01.50 p.m. - 02.20 p.m.	 <b>Dr. Sergei Zinoviev</b>	<p><b>CAPACITY BUILDING PROGRAMMES OF THE INTERNATIONAL COOPERATION BRANCH AIMING AT PROMOTING THE PEACEFUL USES OF CHEMISTRY AND ENSURING CHEMICAL SAFETY AND SECURITY IN THE FRAMEWORK OF THE IMPLEMENTATION OF ART XI OF THE CONVENTION</b></p>
		<p><i>International Cooperation Branch            Organization for the Prohibition of the Chemical Weapons (OPCW)            (NETHERLANDS)</i></p>	
P2.02	02.20 p.m. - 02.40 p.m.	 <b>Prof. Leonardo Palombi</b>	<p><b>GLOBALIZATION, EPIDEMICS and SECURITY</b></p>
		<p><i>Department of Biomedicine and Prevention            University of Rome Tor Vergata            (ITALY)</i></p>	

**PLENARY SESSION 2**  
 12 December 2020 - 02.50 p.m. - 04.00 p.m. (UTC+1 - Italian Time)  
 Virtual Room: AUDITORIUM  
 Chairpersons  
 **Dr. Dieter Rothbacher**  
 **Dr. Andrea Malizia**

**SICC**  
 The importance of multidisciplinary approaches to Cooperation Research  
 10-12 December 2020  
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<p><b>LECTIO MAGISTRALIS</b></p>	<p><b>Prof. Rick FONTANA</b>  </p>	<p><b>ON THE GROUND 9/11, THE RESPONSE &amp; RECOVERY AT GROUND ZERO</b></p>
<p>02.40 p.m. - 03.10 p.m.</p>	<p><i>Director at the City of New Haven Office of Emergency Management &amp; Homeland Security (USA)</i></p>	<p><b>TRENDS AND TRAINING IN NUCLEAR SAFETY AND SECURITY</b></p>
<p><b>P2.O3</b></p>	<p><b>Prof. Francesco d'Errico</b>  </p>	
<p>03.10 p.m. - 03.30 p.m.</p>	<p><i>Department of Civil and Industrial Engineering University of Pisa (ITALY)</i></p>	<p><b>EPIDEMICS, EMERGING AND RE-EMERGING DISEASE: THE IMPORTANCE OF INTERNATIONAL COOPERATION TO REDUCE RISKS</b></p>
<p><b>P2.O4</b></p>	<p><b>Prof. Vasilis Vasiliou</b>  </p>	
<p>03.30 p.m. - 03.50 p.m.</p>	<p><i>Director of the Department of Environmental Health Sciences Yale School of Public Health, University of Yale (USA)</i></p>	

04.00 p.m. - 07.00 p.m.

## POSTER SESSION 1

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

Virtual Room: AUDITORIUM

Chairpersons: Dr. Chierici, Dr. Quaranta, Dr. Gamal



Dr. Chierici



Dr. Quaranta



Dr. Gamal

### 5 minutes of Presentation per POSTER

PO.1.1 THE INFECTIOUS DISEASES SEEKER (IDS): AN INNOVATIVE TOOL FOR PROMPT IDENTIFICATION OF INFECTIOUS DISEASES DURING OUTBREAKS

Federico Baldassi<sup>1</sup>, O. Cenciarelli<sup>2</sup>, A. Malizia<sup>3</sup>, P. Gaudio<sup>1</sup>

1. Department of Industrial Engineering, University of Rome Tor Vergata
2. International CBRNe Master Courses, University of Rome Tor Vergata
3. Department of Biomedicine and Prevention, University of Rome Tor Vergata

## POSTER SESSION 2

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

Virtual Room: LEONARDO

Chairpersons: Dr. Di Giovanni, Dr. Carestia, Dr. Rossi



Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

### 5 minutes of Presentation per POSTER

PO.2.1 THE CENTRAL ROLE OF INTERNATIONAL COOPERATION IN SUPPORTING LOCAL HEALTH AUTHORITIES IN POST-CBRNE: THE DEVELOPMENT OF THE KURDISTAN REGIONAL GOVERNMENT HEALTH INFORMATION SYSTEM (KRG\_HIS), AN EXAMPLE OF BEST PRACTICE

Stefania Moramarco<sup>1</sup>, Faiq Basa<sup>2,3</sup>, Haveen Alsiefanee<sup>3,3</sup>, Sivar Qadir<sup>4,4</sup>, Shahla Othaman<sup>5,6</sup>, Bayar Azeed<sup>6,7</sup>, Gorgees Shlimon<sup>6,7</sup>, Luma Alhanabadi<sup>8,8</sup>, Daniele Di Giovanni<sup>9</sup>, Leonardo Palombi<sup>1</sup>, Leonardo Emberti Gialloreti<sup>1</sup>

1. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy
2. Rizqary Teaching Hospital, Erbil, Kurdistan Region, Iraq
3. Family Medicine, Directorate of Health, Duhok, Kurdistan Region, Iraq
4. Directorate of Health, Sulaimaniya, Kurdistan Region, Iraq
5. Department of Statistics and Informatics, University of Sulaimaniya, Iraq
6. Ph.D. Candidate, Department of Civil Engineering and Computer Science Engineering, University of Rome Tor Vergata, Rome, Italy
7. Computer Systems Engineering, Erbil, Kurdistan Region, Iraq
8. Primary Health Care Department, Preventive Health Affairs Directorate, Duhok, Kurdistan Region, Iraq
9. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy

04.00 p.m. - 07.00 p.m.

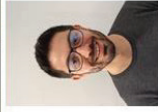
**POSTER SESSION 1**

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)  
Virtual Room: **AUDITORIUM**

Chairpersons: **Dr. Chierici, Dr. Quaranta, Dr. Gamal**



Dr. Chierici



Dr. Quaranta



Dr. Gamal

<p>PO.1.2</p>	<p><b>5 minutes of Presentation per POSTER</b></p>	<p><b>CLIMATE CHANGES AND CBRN</b></p> <p><u>Saeed Bin Hadheer<sup>1,2</sup></u>  <ol style="list-style-type: none"> <li><i>International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></li> <li><i>Dubai Police, Search and Rescue Department, United Arab Emirates</i></li> </ol></p>
<p>PO.1.3</p>	<p><b>LOW COST BISTATIC LIDAR FOR FILTERING EFFICIENCY OF FACE MASKS EVALUATION</b></p>	<p><u>Federico Angelini<sup>1</sup>, Valeria Spizzichino<sup>1</sup></u>  <ol style="list-style-type: none"> <li><i>ENEA</i></li> </ol></p>
<p>PO.1.4</p>	<p><b>A REVIEW OF SINGLE AND MULTI-HAZARD RISK ASSESSMENT APPROACHES FOR CRITICAL INFRASTRUCTURES PROTECTION</b></p>	<p><u>Alessandro Pasino<sup>1</sup>, Andrea Clematis<sup>3</sup>, Silvia De Angeli<sup>2</sup>, Umberto Battista<sup>2</sup>, Davide Ottonello<sup>2</sup></u>  <ol style="list-style-type: none"> <li><i>CNR Imati</i></li> <li><i>STAM s.r.l.</i></li> </ol></p>

**POSTER SESSION 2**

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)  
Virtual Room: **LEONARDO**

Chairpersons: **Dr. Di Giovanni, Dr. Carestia, Dr. Rossi**



Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

<p>PO.2.2</p>	<p><b>5 minutes of Presentation per POSTER</b></p>	<p><b>NUMERICAL SIMULATIONS OF THE DUST PARTICLE RELEASE DURING A LOSS OF VACUUM ACCIDENT IN A NUCLEAR FUSION REACTOR</b></p> <p><u>Rossi Riccardo<sup>1</sup>, Pasquale Gaudio<sup>1</sup>, Luca Martellucci<sup>1</sup>, Andrea Malizia<sup>2</sup></u>  <ol style="list-style-type: none"> <li><i>Department of Industrial Engineering, University of Rome Tor Vergata, 00133, Italy;</i></li> <li><i>Department of Biomedicine and Prevention, University of Rome Tor Vergata, Italy</i></li> </ol></p>
<p>PO.2.3</p>	<p><b>APPLICATION OF DIFFERENTIAL DIODE LASER ABSORPTION SPECTROSCOPY FOR REMOTE DETECTION OF TOXIC GASES</b></p>	<p><u>Romanelli Sara<sup>1</sup></u>  <ol style="list-style-type: none"> <li><i>International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></li> </ol></p>
<p>PO.2.4</p>	<p><b>RISK ASSESSMENT OF RADIOACTIVE WASTE</b></p>	<p><u>Micozzi Andrea</u>  <ol style="list-style-type: none"> <li><i>International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></li> </ol></p>

04.00 p.m. - 07.00 p.m.

**POSTER SESSION 1**

12 December 2020 - 04.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time)  
Virtual Room: **AUDITORIUM**

Chairpersons: **Dr. Chierici, Dr. Quaranta, Dr. Gamal**



Dr. Chierici



Dr. Quaranta



Dr. Gamal

<b>5 minutes of Presentation per POSTER</b>
<p>PO.1.5 <b>CYCLONE DETECTION AND FORECASTING USING DEEP NEURAL NETWORKS THROUGH SATELLITE DATA</b></p> <p>Shweta Kumawati, Tanveer Habib Sardari 1. <i>School of Engineering and Technology, Jain University, Bengaluru</i></p>
<p>PO.1.6 <b>COVID-19 AND SOCIAL MEDIA COMMUNICATION: WHAT LESSON CAN WE LEARN?</b></p> <p>Parrilla Antonio<sup>1</sup> 1. <i>Presidenza del Consiglio dei Ministri</i></p>
<p>PO.1.7 <b>COMMUNICATION IN THE ERA OF SOCIAL MEDIA: HOW TO WRITE A COMMUNICATION PLAN FOR EMERGENCIES</b></p> <p>Parrilla Antonio<sup>1</sup> 1. <i>Presidenza del Consiglio dei Ministri</i></p>

**POSTER SESSION 2**

12 December 2020 - 04.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time)  
Virtual Room: **LEONARDO**

Chairpersons: **Dr. Di Giovanni, Dr. Carestia, Dr. Rossi**



Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

<b>5 minutes of Presentation per POSTER</b>
<p>PO.2.5 <b>EU PREPAREDNESS AND RESEARCH OF SECURITY FOR CBRN THREATS</b></p> <p>Chalaris Michail<sup>1</sup>, Alkaterini Poustouril<sup>2</sup>, Dimitrios Emmanouilidis<sup>3</sup> 1. <i>International Hellenic University, Department of Chemistry (Kavala) – Hellenic Fire Academy, School of Fire Officers, Military Nursing Academy (SAN), Hellenic Fire Corps, Greece.</i> 2. <i>International Hellenic University</i> 3. <i>International Hellenic University, School of Geosciences- Department of Forestry &amp; Natural Environment</i></p>
<p>PO.2.6 <b>CBRN-P3 CLUSTER</b></p> <p>Paola Tessari<sup>1</sup>, Karolina Muti<sup>1</sup>, Gianna Latini<sup>1</sup> 1. <i>Istituto Affari Internazionali (IAI)</i></p>
<p>PO.2.7 <b>RECURRENT NEURAL NETWORK CLUSTER, A NEW INSTRUMENT FOR THE PREDICTION OF INFECTIOUS DISEASES</b></p> <p>Puleio Alessandro <i>Independent researcher</i></p>

04.00 p.m. - 07.00 p.m.

## POSTER SESSION 1

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

Virtual Room: AUDITORIUM

Chairpersons: **Dr. Chierici, Dr. Quaranta, Dr. Gamal**



Dr. Chierici



Dr. Quaranta



Dr. Gamal

### 5 minutes of Presentation per POSTER

PO.1.8

**CRISIS COMMUNICATION AND CBRN TERRORISM: DEVELOPMENT OF A TRAINING CURRICULUM FOR COMMUNICATION EXPERTS AND CBRN ADVISORS**  
 Saman Choudary<sup>1</sup>, Ahmed Gamal Ibrahim<sup>1</sup>, Muhammad Usman Asghar<sup>2</sup>

1. *International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy*
2. *Department of Government and Public Policy, National Defence University, Islamabad, 44000, Pakistan*

PO.1.9

**CLASSIFICATION OF THE CURRENT STANDARD FRAGMENTATION CAPTURE MATERIAL, AND ITS COMPARISON TO ECONOMICAL ALTERNATIVES**

Thomas Ritchie<sup>1</sup>, Richard Critchley<sup>2</sup>, Rachael Hazael<sup>1,2</sup>, David Wood<sup>1</sup>, David Miller<sup>1</sup>, Andrew Roberts<sup>1</sup>, Steve Johnson<sup>3</sup>

1. *Centre for Defence Engineering, Cranfield University, Defence Academy of the United Kingdom, Shrivenham, SN6 8LA*

## POSTER SESSION 2

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

Virtual Room: LEONARDO

Chairpersons: **Dr. Di Giovanni, Dr. Carestia, Dr. Rossi**



Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

### 5 minutes of Presentation per POSTER

PO.2.8

**DNMTs ASSOCIATED GLOBAL EPIGENETIC SILENCING PROMOTES BREAST CANCER METASTASIS**

Anam Rafique<sup>1</sup>, Muhammad Mustafa<sup>1</sup>

1. *School of Life Sciences, Forman Christian College (A Chartered University), Lahore, Pakistan*

PO.2.9

**CWA DISPOSAL: A NEW APPROACH**

Ciampa Sabatino<sup>1</sup>

1. *International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy*
2. *Engineering, Design and Mathematics, University of the West of England, Frenchay Campus, Coldharbour Lane, Bristol BS26 1QY*
3. *Cranfield Forensic Institute, Cranfield University, Defence Academy of the United Kingdom, Shrivenham, SN6 8LA*

04.00 p.m. - 07.00 p.m.

## POSTER SESSION 1

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

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Dr. Chierici



Dr. Quaranta



Dr. Gamal

### 5 minutes of Presentation per POSTER

PO.1.10

**EVALUATION OF THE SPATIO TEMPORAL EPIDEMIOLOGICAL MODELER (STEM) DURING THE RECENT COVID-19 PANDEMIC.**

F. Baldassi<sup>1,2</sup>, F. D'Amico<sup>2</sup>, A. Malizia<sup>3</sup> and P. Gaudio<sup>3,2</sup>

1. Department of Industrial Engineering, University of Rome Tor Vergata
2. International CBRNe Master Courses, University of Rome Tor Vergata
3. Department of Biomedicine and Prevention, University of Rome Tor Vergata

PO.1.11

**THE EXPERIMENTAL NEUTRON CROSS SECTION OF BARITE-ENRICHED CONCRETE IN THE ENERGY RANGE 1 MEV - 1 KeV**

Marco Martellucci<sup>1</sup>, Giovanni Romanelli<sup>2</sup>, Silvio Valeri<sup>1</sup>, Danilo Cottone<sup>3</sup>, and Roberto Senesi<sup>4</sup>

1. Mardel Srl, Via Topino 35, Roma, ITALY
2. ISIS Facility, Rutherford Appleton Laboratory, Didcot OX11 0OX, United Kingdom
3. Bariblock - SVA S.r.l., Via Meucci 26, Noventa di Piave (VE), 30020, ITALY
4. Dipartimento di Fisica and NAST Centre, Università degli Studi di Roma "Tor Vergata", 00133 Roma, Italy

## POSTER SESSION 2

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

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Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

### 5 minutes of Presentation per POSTER

PO.2.10

**CONTACT-FREE AND FAST DETECTION OF ENERGETIC MATERIALS IN CONTAINMENTS**

Dominik Wild<sup>1</sup>, Cathrin Theiß<sup>2</sup>, Gerhard Holl<sup>1,2</sup>

1. Institute for the Protection of Terrestrial Infrastructures, Germany
2. German Aerospace Center (DLR), 53757 St. Augustin, Germany

PO.2.11

**COVID-19 - EFFECTS OF CORONAVIRUS ON THE EUROPEAN SOVEREIGN CREDIT DEFAULT SWAPS MARKET**

Oumayma Nadi<sup>1</sup>, Daoui Driss<sup>1</sup>

1. Analyse, évaluation et gestion des risques

04.00 p.m. - 07.00 p.m.

## POSTER SESSION 1

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

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Dr. Chiericí



Dr. Quaranta



Dr. Gamal

5 minutes of Presentation per POSTER

PO.1.12

### EVALUATION OF THE TECNOMUSE MUON TOMOGRAPHY SCANNER IN A REAL SCENARIO

Enrico Preziosi<sup>1</sup>, Claudio Fornaro<sup>3</sup>, Claudia Scatigno<sup>4</sup>, Laura Fazi<sup>1</sup>, Anna Prioriello<sup>2</sup>, Valerio Scacco<sup>1</sup>, Roberto Senesi<sup>1</sup> and Alessandro Cianchi<sup>1</sup>

1. *NAST Center and Department of Physics, University of Rome "Tor Vergata", Rome, Italy*
2. *IRCSS Neuromed, Pozzilli (IS), Italy*
3. *Faculty of Engineering, Uninettuno University, Rome, Italy*
4. *Museo Storico della Fisica e Centro Studi e Ricerche Enrico Fermi, Rome, Italy*

## POSTER SESSION 2

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

Virtual Room: LEONARDO

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Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

5 minutes of Presentation per POSTER

PO.2.12

### ALLIUM CEPA USED AS A BIOTA FOR DETECTION OF RADIOLOGICAL AND NUCLEAR EMERGENCIES

Magno Nogueira Xavier<sup>1</sup>, Ruan Pitágoras Melo Feitoza<sup>1</sup>, Silmara de Moraes Pantaleão<sup>2</sup>, Ricardo Scher<sup>3</sup>, Francesco d'Errico<sup>4,5</sup>, Susana Oliveira de Souza<sup>1</sup>

1. *Departamento de Física, Universidade Federal de Sergipe, São Cristóvão, SE, Brasil*
2. *Departamento de Biologia, Universidade Federal de Sergipe, São Cristóvão, SE, Brasil*
3. *Departamento de Morfologia, Universidade Federal de Sergipe, São Cristóvão, SE, Brasil*
4. *School of Engineering, University of Pisa, Pisa, Italy*
5. *School of Medicine, Yale University, New Haven, CT, USA*



04.00 p.m. - 07.00 p.m.

## POSTER SESSION 1

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Dr. Chierici



Dr. Quaranta



Dr. Gamal

5 minutes of Presentation per POSTER

PO.1.13

**CYTOGENETIC BIO-DOSIMETRY TECHNIQUES IN THE DETECTION OF DICENTRIC CHROMOSOMES (DCS) INDUCED BY RADIOLOGICAL EVENTS**

G. M. Ludovici<sup>1</sup>, M.G. Cascone<sup>2</sup>, T. Huber<sup>3</sup>, A. Chierici<sup>1,2</sup>, P. Gaudio<sup>1</sup>, S.O.de Souza<sup>4</sup>, F. d'Eririco<sup>2</sup> and A. Malizia<sup>5</sup>

1. Department of Industrial Engineering, University of Rome Tor Vergata, Rome, Italy
2. Department of Civil and Industrial Engineering, University of Pisa, Pisa, Italy
3. Radosys Ltd, Budapest, Hungary
4. Physics Department, Federal University of Sergipe – UFS, Aracaju, Brazil
5. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy

## POSTER SESSION 2

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC-1 - Italian Time)

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Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

5 minutes of Presentation per POSTER

PO.2.13

**DESIGN AND OPTIMIZATION OF MINIATURIZED SENSORS FOR UAV APPLICATION: A NEW PATHWAY FOR EARLY WARNING**

Mattia Bianchelli<sup>1,2</sup>, Francesca Fumiani<sup>2</sup>, Andrea Chierici<sup>1</sup>, Riccardo Rossi<sup>3</sup>, Luca Martellucci<sup>1</sup>, Gaetano Carminat<sup>3</sup>, Pasquino Gaudio<sup>2</sup> and Danièle Di Giovanni<sup>1,4</sup>

1. Department of Industrial Engineering, University of Rome Tor Vergata, 00133, Italy;
2. Joint NBC Defence School of Rieti, 02100, Italy;
3. Head of Technical Operational Unit, Ministry of Foreign Affairs and International Cooperation, Direction of Politics and Security General Affairs, Italian National Authority for the implementation of the Chemical Weapons Convention
4. Unicamillus-Saint Camillus International University of Health Sciences, 00131, Italy;

04.00 p.m. - 07.00 p.m.

## POSTER SESSION 1

12 December 2020 - 04.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time)

Virtual Room: **AUDITORIUM**

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Dr. Chierici



Dr. Quaranta



Dr. Gamal

### 5 minutes of Presentation per POSTER

PO.1.14

**ARE CITIZEN SCIENTISTS READY TO MEASURE DOSES AND HEALTH/WEEL-BEING INDICATORS WITH MOBILE APPS AFTER A NUCLEAR ACCIDENT?**

Ljudmila Liutsko<sup>1,3</sup>, Paola Fattibene<sup>4</sup>, Sara Della Monaca<sup>4</sup>, Aya Goto<sup>5</sup>, Takashi Ohba<sup>5</sup>, Deborah Oughton<sup>6</sup>, Yevgeniya Tomkiv<sup>6</sup>, Vadim Chumak<sup>7</sup>, Adelaida Sarukhan<sup>8</sup> and Elisabeth Cardis<sup>3,3</sup>  
1SGIabai, Barcelona, Spain  
2UPF, Barcelona, Spain  
3CIBERESP, Madrid, Spain  
4ISS, Rome, Italy  
5FMUJ, Fukushima, Japan  
6NMBU/CERAD, Aas, Norway  
7NRCRM, Kyiv, Ukraine

PO.1.15

**PLANT TOXINS AND BIOTERRORISM: A REVIEW ON THE THREAT**

Ludovici Gian Marco<sup>1,2</sup>, Arduini Daniela<sup>1</sup>, Gaudio Pasqualino<sup>1,2</sup>, Chierici Andrea<sup>2,2</sup> and Andrea Malizia<sup>4</sup>

1. *International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy*
2. *Department of Industrial Engineering, University of Rome Tor Vergata, Italy*
3. *Department of Civil and Industrial Engineering, University of Pisa, Italy*
4. *Department of Biomedicine and Prevention, University of Rome Tor Vergata, Italy*

## POSTER SESSION 2

12 December 2020 - 04.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time)

Virtual Room: **LEONARDO**

Chairpersons: **Dr. Di Giovanni, Dr. Carestia, Dr. Rossi**



Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

### 5 minutes of Presentation per POSTER

PO.2.14

**THE RE-EMERGENCE OF CHEMICAL THREATS AND THE ROLE OF THE OPCW. THE ENTRY INTO FORCE OF CHANGE TO SCHEDULE 1 OF THE ANNEX ON CHEMICALS TO THE CHEMICAL WEAPONS CONVENTION AND THE IMPACT IN THE INDUSTRY**

Daniele Meuti<sup>1</sup>, Carminati Gaetano<sup>2,3</sup>, Borgiani Stefano<sup>3</sup>

1. *Ministry of Defence Italian Army;*
2. *Ministry of Defence Italian Navy*
3. *Ministry of Foreign affairs and international cooperation*

PO.2.15

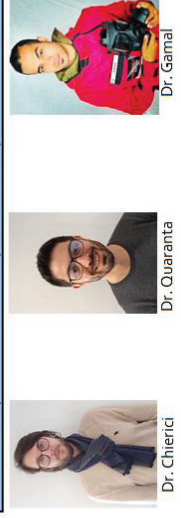
**UAV MODULAR PAYLOAD FOR MISSION-ORIENTED CONFIGURATIONS IN THE SURVEY AND MONITORING OF AREAS EXPOSED TO CHEMICAL AND RADIOLOGICAL CONTAMINATION**

Francesca Fumian<sup>1,2</sup>, Andrea Chierici<sup>1</sup>, Riccardo Rossi<sup>1</sup>, Gaetano Carminati<sup>1</sup>, Andrea Malizia<sup>3</sup>, Pasqualino Gaudio<sup>3</sup> and Daniele Di Giovanni<sup>1,4</sup>

1. *Department of Industrial Engineering, University of Rome Tor Vergata, 00133, Italy;*
2. *Joint NBC Defence School of Rieti, 02100, Italy;*
3. *Department of Biomedicine and Prevention, University of Rome Tor Vergata, 00133, Italy;*
4. *Unicamillus-Saint Camillus International University of Health Sciences, 00131, Italy;*

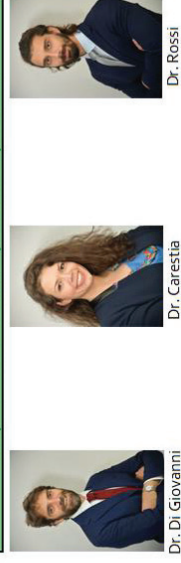
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**POSTER SESSION 1**  
 12 December 2020 - 04.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time)  
 Virtual Room: **AUDITORIUM**  
 Chairpersons: **Dr. Chierici, Dr. Quaranta, Dr. Gamal**



5 minutes of Presentation per POSTER	
PO.1.16 <b>RESPONSE TESTS OF SR12(EU) SCINTILLATION SPECTROMETERS FOR THYROID MONITORING IN NUCLEAR EMERGENCY SITUATIONS</b>  Masahiro Hosoda <sup>1</sup> , Kazuki Iwaoka <sup>2</sup> , Akira Yunoki <sup>2</sup> , Takahiro Fukuhara <sup>4</sup> , Yusuke Imajo <sup>4</sup> , Yuki Tamakuma <sup>3</sup> , Shinji Tokonami <sup>4</sup> <sup>1</sup> Hiroaki University <sup>2</sup> National Institutes for Quantum and Radiological Science and Technology <sup>3</sup> National Institute of Advanced Industrial Science and Technology <sup>4</sup> Advanced Fusion Technology, Co., Ltd.	Dr. Chierici Dr. Quaranta Dr. Gamal
PO.1.17 <b>EVALUATION OF THE PERMANENCE OF FLAME ACCELERATING MATERIAL ON BURNED MATERIAL WITH GCMS ANALYTICAL TECHNIQUES</b>  Claudio De Maio <sup>1</sup> 1. Ministry of Interior - Italian National Fire Corps	

**POSTER SESSION 2**  
 12 December 2020 - 04.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time)  
 Virtual Room: **LEONARDO**  
 Chairpersons: **Dr. Di Giovanni, Dr. Carestia, Dr. Rossi**



5 minutes of Presentation per POSTER	
PO.2.16 <b>COMMUNICATION AND DECISION SUPPORT SYSTEMS FOR RESCUE AND EMERGENCIES</b>  Luigi Palestini <sup>1</sup> 1. CNVVF (Italian Fire and Rescue Service)	Dr. Di Giovanni Dr. Carestia Dr. Rossi
PO.2.17 <b>PREVALENCE OF OCCUPATIONAL DISEASES DUE TO BIOLOGICAL AGENTS ON WORKFORCE POPULATION (OVERALL AND BY SECTORS) IN ITALY IN THE YEARS 2014-2018 USING INAIL AND ISTAT DATABASES</b>  Scarano Laura <sup>1</sup> , De Carli Matteo <sup>1</sup> , Ingravalle Fabio <sup>1</sup> , Amadori Fabiana <sup>1</sup> , Macino Mattia <sup>1</sup> , Abbondanzieri Alessio <sup>1</sup> , Lucaroni Francesca <sup>2</sup> . 1. School of Specialization in Hygiene and Preventive Medicine, University of Rome Tor Vergata, Roma 2. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Roma	

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Virtual Room: AUDITORIUM

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Dr. Chierici



Dr. Quaranta



Dr. Gamal

### 5 minutes of Presentation per POSTER

PO.1.18

**THE OPTIMISATION OF NUCLEAR REACTIONS FOR THE PRODUCTION OF INDUSTRIAL RADIOTRACERS USING JOB-TIP COMPUTATIONAL PACKAGE**

R. AM Allen<sup>1,2</sup>, D. Hampel<sup>1,2</sup>, Tz. Kokalova Wheldon<sup>1</sup>, A. Hollands<sup>2</sup>, C. Wheldon<sup>1</sup>, P. Ivanov<sup>2</sup>, B. Russell<sup>2</sup>

<sup>1</sup>. Nuclear Physics Group, School of Physics and Space Research, The University of Birmingham, Birmingham, B15 2TT, U.K.

<sup>2</sup>. Nuclear Metrology Group, National Physical Laboratory, Hampton Rd, Teddington TW11 0LW, U.K.

PO.1.19

**PERFORMANCES OF INTRUSION DETECTION SYSTEM USING KDD CUP 99**

Siti Norwahidah Binti Wahab, Noor Suhana Binti Sulaiman, Noraniah Binti Abdul Aziz

<sup>1</sup>. University College TATI, Malaysia

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Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

### 5 minutes of Presentation per POSTER

PO.2.18

**CONVERGENT APPROACH TO DYNAMIC SYSTEMS SAFETY – COGNITIVE ASPECTS**

Oleg O. Illiashenko<sup>1</sup>, Valery P. Mygal<sup>2</sup>, Galyna V. Mygal<sup>3</sup>, Olga F. Protasenko<sup>4</sup>

<sup>1</sup> Department of Computer Systems Networks and Cybersecurity, National Aerospace University "Kharkiv Aviation Institute", Ukraine

<sup>2</sup> Department of Physic, National Aerospace University "Kharkiv Aviation Institute", Ukraine

<sup>3</sup> Department of Automobile and Transport Infrastructure, National Aerospace University "Kharkiv Aviation Institute", Ukraine

<sup>4</sup> Department of Environmental Technologies, Ecology and Safety of Vital Activity, Simon Kuznets Kharkiv National University of Economics

PO.2.19

**APPLICATION OF EYE TRACKING TECHNOLOGY FOR ASSESSMENT AND ASSURANCE OF SECURITY AND SAFETY-CRITICAL SYSTEMS**

Oleksandr Gordiiev<sup>1</sup>, Oleg Illiashenko<sup>2</sup>, Vyacheslav Kharchenko<sup>3</sup>

<sup>1</sup> Banking University, Department of Cybersecurity

<sup>2</sup> National Aerospace University "Kharkiv Aviation Institute" (KhAI), Department of Computer Systems, Networks and Cybersecurity

04.00 p.m. - 07.00 p.m.

## POSTER SESSION 1

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

Virtual Room: AUDITORIUM

Chairpersons: Dr. Chierici, Dr. Quaranta, Dr. Gamal



Dr. Chierici



Dr. Quaranta



Dr. Gamal

### 5 minutes of Presentation per POSTER

PO.1.20

**DESIGNING A NEW APPROACH FOR RISK REDUCTION DURING PANDEMIC EMERGENCIES LIKE SARS-COV-2: POST-MORTEM INVESTIGATION THROUGH VIRTUAL AUTOPSY TECHNIQUES**

Laura Filograna<sup>1</sup>, Andrea Malizia<sup>1</sup>, Colleen Patricia Ryan<sup>3</sup> and Guglielmo Manenti<sup>1</sup>

1. Policlinico Tor Vergata: Fondazione PTV, Via di Montpellier 1, 00133 Rome (Italy)
2. Department of Biomedicine and Prevention, University of Rome Tor Vergata, Via di Montpellier 1, 00133 Rome (Italy)
3. University of Rome Tor Vergata, Via di Montpellier 1, 00133 Rome (Italy)

PO.1.21

**ACCURATE NUMERICAL EVALUATION OF HUMAN EXPOSURE TO BROADBAND RADIATED FIELDS BY PORTABLE SYSTEMS**

Agostino Monorchio<sup>1</sup>, Eliana Canicatti<sup>1</sup>, Elisa Giampietri<sup>1</sup>, Danilo Brizi<sup>1</sup> Nunzia Fontana<sup>1</sup>

1. University of Pisa

## POSTER SESSION 2

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)

Virtual Room: LEONARDO

Chairpersons: Dr. Di Giovanni, Dr. Carestia, Dr. Rossi



Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

### 5 minutes of Presentation per POSTER

PO.2.20

**F.A.Q. - (Filtered Air Quality) – APPLICATION FOR FILTERING AND MONITORING THE QUALITY OF BREATHING AIR**

Roberto Mo<sup>1</sup>, Fabrizio Pirri<sup>1</sup>

1. Dept. of Applied Science and Technology - Politecnico di Torino

PO.2.21

**NEW TECHNOLOGIES FOR THE CBRNe FILTRATION THROUGH NANOTECHNOLOGIES AND FOTOCATALYSIS**

Giovanni Baldi<sup>1</sup>, Luca Pinciarelli<sup>2</sup>

1. COLOROBIA CONSULTING – Centro Ricerche COLOROBBIA
2. BMD spa

04.00 p.m. - 07.00 p.m.

**POSTER SESSION 1**  
 12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)  
 Virtual Room: **AUDITORIUM**  
 Chairpersons: **Dr. Chierici, Dr. Quaranta, Dr. Gamal**



Dr. Chierici



Dr. Quaranta



Dr. Gamal

**5 minutes of Presentation per POSTER**

PO.1.22

**THREATS TO PLANT HEALTH: IMPACT AND RISKS FOR HUMAN SECURITY**

Stefania Tegli<sup>1</sup>, Giovanni Agati<sup>1</sup>, Luca Calamai<sup>1</sup>, Lucia Cavigli<sup>1</sup>, Dario Gaudioso<sup>1</sup>

1. *Dipartimento di Scienze e Tecnologie Agrarie, Alimentari, Ambientali e Forestali – Università di Firenze*

PO.1.23

**CBRN RISK COMMUNICATION TO MEMBERS OF THE PUBLIC IN CASE OF A TERRORIST ATTACK**

Jozef Sabal<sup>1</sup>, Otakar Milka<sup>1</sup>

1. *Police Academy of the Czech Republic in Prague, Lhotecka 559/71 443 91 Prague 4, (Czech Republic)*

PO.1.24

**DISPLACEMENT, RISK AND RESILIENCE: REBUILDING THE LIVES OF INTERNALLY DISPLACED WOMEN IN NIGERIA PLAYFULLY**

Jayne Mwangi<sup>1</sup>, Victor Ladan Lutsili<sup>1</sup>, Desire Adebimpe Fashina<sup>1</sup>

1. *Technical University of Mombasa, Kenya*

PO.1.25

**RISK ASSESSMENT INSTITUTIONAL APPROACHES FOR DISASTERS MANAGEMENT: US, UN AND EU CASES**

Marco Carbonelli<sup>1</sup>, Maniachiara Carestia<sup>1</sup>, Riccardo Quaranta<sup>1</sup>

1. *Department of Industrial Engineering, University of Rome Tor Vergata*

**POSTER SESSION 2**

12 December 2020 - 04.00 p.m. - 07.00 p.m (UTC+1 - Italian Time)  
 Virtual Room: **LEONARDO**

Chairpersons: **Dr. Di Giovanni, Dr. Carestia, Dr. Rossi**



Dr. Di Giovanni



Dr. Carestia



Dr. Rossi

**5 minutes of Presentation per POSTER**

PO.2.22

**PAPER-BASED ELECTROCHEMICAL DEVICE FOR ON-SITE AND RAPID DETECTION OF BOTULINUM NEUROTOXIN SEROTYPES A AND C**

Fabiana Arduini<sup>1</sup>, Veronica Caratelli<sup>1</sup>

1. *Department of Chemical Science and Technologies – University of Rome "Tor Vergata"*

PO.2.23

**A GENERAL MULTI-RISK ASSESSMENT METHOD FOR NATURAL DISTASTERS AND CBRNE ATTACKS**

Marco Carbonelli<sup>1</sup> and Laura Gratta<sup>2</sup>

1. *Department of Industrial Engineering, University of Rome Tor Vergata (Italy)*  
 2. *Risk Management Expert, Italian Public Administration (Italy)*

PO.2.24

**HOW MACROECONOMIC DETERMINANTS AFFECTING COMMERCIAL BANKS NON-PERFORMING LOAN IN ETHIOPIA COMMERCIAL BANK**

Getchaw Mulat<sup>1</sup>

1. *Department of Economics, Aksum University Tigray, Ethiopia*

PO.2.25

**DEVELOPMENT OF DELIBERATION-BASED ORGANIZATIONS FOR CONSENSUS IN RURAL CENTRAL JAVA, INDONESIA**

Koes Indrati<sup>1</sup>, Bambang Tri Cahyono<sup>1</sup>

1. *Universitas Pelita Bangsa, Indonesia*

**DAY 1**  
**10 December 2020**

**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events [10 December 2020, 08.20 a.m. - 01.00 p.m. (UTC+1 - Italian Time), Virtual Room: Leonardo]**

<b>T.1-D.1-O.1</b>	<b>AUTONOMOUS, TRANSPORTABLE LIF BASED DETECTION SYSTEM FOR FAST IN SITU CLASSIFICATION OF BIOLOGICAL HAZARDS</b>
08.20 a.m. - 08.45 a.m.	<p><u>J. Grzesiak<sup>1</sup>, Ch. Kölbl<sup>1</sup>, M. Kraus<sup>1</sup>, L. Fellner<sup>1</sup>, K. Grünewald<sup>1</sup>, and F. Duschek<sup>1</sup></u>  <sup>1. German Aerospace Center (DLR), Institute of Technical Physics, Im Langen Grund 1, 74239 Hardthausen, Germany</sup></p> <p>In an effort to reduce the potential risk of human exposure to chemical or biological hazardous materials, the demand increases for a detection system which rapidly identifies possible threats from a distance to avoid direct human contact to these materials. Spectrally and time-resolved laser-induced fluorescence (LIF) with multiple excitation wavelengths has demonstrated to be a performing candidate for biological stand-off detection. These results can be used to develop small scale, transportable systems for in situ detection, which are simple in design and highly resolving. We present a technology demonstrating device for detection of biological agents on relevant surfaces. The compact and transportable system utilizes multi-wavelength excitation and is designed for a standoff distance between 3 and 10 m and fast simultaneous acquisition of full-featured, i.e. the spectral and time resolved, fluorescence response of the illuminated target. The surface-scanning technique of the apparatus allows for applied studies on mapping of contaminated surfaces. Additionally, intensive investigations on sensitivity requirements can be performed, such as on the required scanning speed and on the discrimination of LIF signals from hazards and carrier/background material.</p> <p>To this end we present detailed studies on the interplay between scanning speed and identification accuracy, minimizing the time for a complete scan of the site. With respect to realistic detection scenarios we discuss the capabilities of our system concerning the distinction between the contamination and the contamination carrier based on detailed measurements.</p>
<b>T.1-D.1-O.2</b>	<b>AERIAL REMOTE SENSING OF HAZARDOUS CBE AGENTS BY MEANS OF AN UAV-AIDED LASER BASED STANDOFF DETECTION SYSTEM</b>
08.45 a.m. - 09.10 a.m.	<p><u>Christoph Kölbl<sup>1</sup>, Daniel Weigl<sup>1</sup>, Jonas Grzesiak<sup>1</sup>, Frank Duschek<sup>1</sup></u>  <sup>1. German Aerospace Center (DLR), Institute of Technical Physics, 74239 Hardthausen, Germany</sup></p> <p>Within the last decades the global architecture of security has fundamentally changed. Terrorist attacks and attempted attacks showed that preventive measures and immediate countermeasures are important for protecting critical infrastructures and humans. A fast reconnaissance can prevent human contact to hazardous materials from intended and accidental output from CBE hazardous materials. That is why a fast, flexible and reliable remote detection of CBE traces and contaminations is a crucial aspect for an improved security.</p> <p>LUCS (Laser based UAV classification system) is an innovated, drone-based remote detection system developed by the DLR Institute of Technical Physics. Based on a laser-spectroscopic technique, this system is specially designed for contactless remote-recognition of hazardous chemical agents on surfaces without any human contact with a detection rate of up to 1 kHz at a working distance between 5 – 15 m. The compact sensor is mounted on a commercial UAV and is well integrated into the UAVs power supply and control unit. Due to a maximal take-off weight of 15kg the systems belong to class C3 and can easily be used by government agencies and organizations with security tasks. Within the context of the 2nd SICC Conference we present first experimental results acquired during our field tests of the LUCS system on the DLR test range. These measurements confirm the feasibility of a sensitive airborne CE standoff detection system, which is capable to classify released substances in real time to prompt for appropriate countermeasure.</p>



**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**

Chairpersons: Prof. Pasquale Gaudio, Prof. Prof. José Luis Pérez Díaz and Dr. Frank Duschek

DAY 1 - 10 December 2020

<b>T.1-D.1-O.3</b>	<b>LASER BASED TECHNIQUES FOR CHEMICAL DETECTION AND IDENTIFICATION AT UNIVERSITY OF ROME TOR VERGATA, ACTUAL AND FUTURE CAPABILITIES</b>
09.10 a.m. - 09.35 a.m.	<p>Pasquale Gaudio<sup>1</sup></p> <p><i>1. Department of Industrial Engineering – University of Rome Tor Vergata, Via del Politecnico 1, 00133 Roma, Italy.</i></p> <p>The active remote sensing standoff detection is very interesting methodologies that could be used in case of intentional (terrorism or war) or accidental (natural or incident event) diffusion in an air of chemical agents with the aim to reduce the risk for the health worldwide. At the present day, there are several laser-based methodologies used for research applications that could be applied for this aim. Primarily two methodologies seem to be integrated to realize an efficient monitoring network based on active remote sensing systems. The integration of lidar and dial technologies could guarantee the development of a network of low-cost systems for chemical detection and identification of both natural and anthropic release. At this aim, the constant improvement of technologies permits to be fiduciary for compact and low-cost new system development. The evolution of the active systems developed in the last decades at University of Rome Tor Vergata will be presented to show the actual and future capabilities.</p>
<b>T.1-D.1-O.4</b>	<b>SURFACE-ENHANCED RAMAN SPECTROSCOPY FOR THE DETECTION OF CHEMICAL-BIOLOGICAL AGENT IN TRACES: AN INNOVATIVE TECHNIQUE FOR THE RAPID DETECTION OF SECURITY AND COUNTERTERRORISM ISSUES</b>
09.35 a.m. - 10.00 a.m.	<p>Salvatore Almaviva<sup>1</sup>, Florinda Artuso<sup>1</sup>, Antonella Lai<sup>1</sup>, Isabella Giardina<sup>1</sup>, Antonio Palucci<sup>1</sup>, Alessandra Pasquo<sup>1</sup></p> <p><i>1. ENEA, Diagnostics and Metrology Laboratory, FSN-TECFIS-DIM, vie Enrico fermi, 45, I-00040, Frascati, Italy</i></p> <p>The development of new, fast and direct methods for the detection of CBRNe materials is increasingly important for applications related to security and, more generally, to the fight against terrorism and crime. Of no minor importance is to support the work of scientific investigation for the production of criminal trials. In this framework the sensitivity and specificity of the various techniques is a crucial objective. Raman Spectroscopy (RS) and its emerging branch Surface-Enhanced-Raman-Spectroscopy (SERS) are techniques very useful for this purpose. Indeed, thanks to their molecular specificity and the ability to examine the unknown samples in traces without manipulation, in a non-destructive way, simply and quickly it is possible to complete the response in few minutes. RS and SERS detect molecular vibrations related to chemical bondings in the compound to be identified.</p> <p>In this work we report the results of RS-SERS measurements on different compounds and microorganisms: Ammonium Nitrate, (responsible for the explosive event occurred in Beirut on 4th of August 2020), polycyclic aromatic hydrocarbons (PAH) whose exposure of civilians or deployed personnel constitutes an acute exposure scenario and the gram-negative bacterium Escherichia coli, whose presence in the hydric basins is an indicator of water contamination. RS-SERS Spectra were obtained exciting the analytes with a 785 nm focused diode-laser of a commercial table-top portable Raman system (i-Raman by BWTek Inc.). The spectral features of each samples were clearly identified and characterized according to literature data.</p>

**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**

Chairpersons: Prof. Pasquale Gaudio, Prof. Prof. José Luis Pérez Díaz and Dr. Frank Duschek

DAY 1 - 10 December 2020

<b>T.1-D.1-O.5</b>	<b>LASER INDUCED FLUORESCENCE (LIF) DETECTION AND DISCRIMINATION OF BACTERIA FROM OILS, POLLEN, AND CHEMICALS: EVALUATION OF MEDIUM SIZED SAMPLE SETS AND EVALUATION OF CLASSIFICATION ROBUSTNESS</b>
10.00 a.m. - 10.25 a.m.	<p><b>Lea Fellner<sup>1</sup>, Marian Kraus<sup>1</sup>, Arne Walter<sup>1</sup>, Frank Duschek<sup>1</sup></b>  <sup>1. German Aerospace Center, Institute of Technical Physics, Langer Grund, Lampoldshausen, 74239 Hardthausen, Germany</sup></p> <p>Laser induced fluorescence (LIF) technology can be applied for instant detection and localization of bacterial aerosol clouds and bacteria on surfaces from distances exceeding 100 m. The technique enables the discrimination of bacteria from other substances in the environment like pollen or chemicals. Therefore, this sensitive technology is an excellent choice for the detection of anomalies. For identification of bacteria classical methods like polymerase chain reaction, DNA sequencing or immunological methods may be used in a second confirmation step. Different oils and bacterial species were excited with laser pulses of wavelengths of 266 nm and 355 nm. The fluorescence data have been analyzed by means of machine learning algorithms. Classification of test data of two classes oils and bacteria resulted in accuracies of 100 %. With more detailed classes (on the level of bacterial species) obtained accuracies were found higher to be than 90% within the set of samples. In addition, from the large manifold of relevant samples, a set of 25 different chemicals and bio-agents has been examined under outdoor conditions with laser pulses of 280 nm and 355 nm wavelengths for excitation. The robustness of the LIF detection method has been evaluated: Three different bacterial species were freshly prepared in three different concentrations, repeated on three different days resulting in natural deviations of concentration and metabolic variations. LIF spectral data have been recorded and classification between bacteria and other substances resulted in 99,5% accuracy.</p>
<b>T.1-D.1-O.6</b>	<b>CAN LAB ON-CHIP AND ORGAN-ON-CHIP DEVICES REPRESENT A NOVEL TOOL TO STUDY CHEMICAL AND BIOLOGICAL AGENTS INTERACTION WITH BIOLOGICAL MODELS?</b>
10.25 a.m. - 10.50 a.m.	<p><b>D. Di Giuseppe<sup>1,2</sup>, M.C. Comes<sup>1,2</sup>, M. D’Orazio<sup>1,2</sup>, P. Casti<sup>1,2</sup>, J. Filippi<sup>1,2</sup>, A. Mencattini<sup>1,2</sup>, C. Di Natale<sup>1</sup>, E. Martinelli<sup>1,2</sup></b>  <sup>1. Dept. Electronic Engineering, University of Rome Tor Vergata, Rome, Italy</sup>  <sup>2. Interdisciplinary Center of Advanced Study of Organ-on-Chip and Lab-on-Chip Applications (IC-LOC), University of Rome Tor Vergata, Rome, Italy</sup></p> <p>The growing interest in the use of lab-on-chip and organ-on-chip is due to the ability of this technology to be able to emulate in a precise and controlled manner even portions of tissues and biological models. For this reason, this approach is becoming a useful tool for studying the mechanisms underlying diseases such as neurodegenerative and cancer but also for testing new drugs. On the other hand, the complexity of the processes involved in biological agents and their effects requires the intervention of a multidisciplinary approach that put technologically updated equipment, such as lab-on-chip (LOC) and organ on chip (OOC) in support of the investigation of the cross-talk between the agents and human tissues and organs. In particular, in this talk, we will illustrate the potentiality of such a platform with some examples related to drug testing and the investigation of cancer-immune cells cross-talk highlighting how these devices can be used to study the interaction between biological agents and the human tissues at cells level, and how we can design a personalized platform for the early and massive quantitative investigation of such effects by means of video analysis and machine learning techniques.</p>

**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**  
 Chairpersons: Prof. Pasquale Gaudio, Prof. Prof. José Luis Pérez Díaz and Dr. Frank Duschek  
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<b>T.1-D.1-O.7</b>	<b>RDX REMOTE RAMAN DETECTION ON NATO SET-237 SAMPLES</b>
10.50 a.m. - 11.15 a.m.	<p data-bbox="358 231 847 256">Luca M. L. Cantu, Emanuela C. A. Gallo, Frank Duschek</p> <p data-bbox="358 263 593 287"><i>1. DLR, German Aerospace Center</i></p> <p data-bbox="358 294 1156 584">Ultraviolet Raman spectroscopy measurements have been performed at DLR Lampoldshausen to detect NATO SET-237 standard samples of RDX. The goal was to quantify the minimum requirements for an unambiguous identification in remote detection (60 cm distance) arrangement using simple and robust spectroscopic equipment on well-defined distribution of explosives on surfaces. Therefore, Raman spectra of RDX have been acquired for different sample concentrations (50, 250, and 1000 <math>\mu\text{g}/\text{cm}^2</math> respectively) and under several laser energies (1.5, 3.0 and 5.0 mJ/pulse respectively) at 355 nm excitation wavelength. The lowest producible surface concentration (50 <math>\mu\text{g}/\text{cm}^2</math>) was detected with excitation energy of 3 mJ/pulse in the described configuration. The presented Raman spectra are also discussed in terms of future applications.</p>
<b>T.1-D.1-O.8</b>	<b>MONOLITHIC SYNTHETIC SINGLE CRYSTAL DIAMOND BASED <math>\Delta\text{E}</math>-E CHARGED PARTICLE TELESCOPE</b>
11.15 a.m. - 11.40 a.m.	<p data-bbox="358 680 1031 706">S. Cesaroni, M. Marinelli, E. Milani, S. Palomba, C. Verona, G. Verona-Rinati</p> <p data-bbox="358 713 1147 737"><i>1. Department of Industrial Engineering – University of Rome Tor Vergata, Via del Politecnico 1, 00133 Roma, Italy.</i></p> <p data-bbox="358 744 1156 1033">Fusion and fission nuclear reactors as well as ion beam accelerator facilities are featured by complex mixed radiation fields of different types and energies. The development of radiation-hard detectors able to identify the contribution of each particle in such radiation fields is mandatory. Thanks to its interesting properties such as high radiation hardness, low sensitivity to <math>\gamma</math>-rays, fast response time and good capability to operate at high temperatures, diamond based detector can be a good candidate for these applications. In this work, we report on the design and fabrication of a novel <math>\Delta\text{E}</math>-E particle telescope based on synthetic single crystal diamond. The device consists of two separate detectors, fabricated in a boron doped /intrinsic diamond/ Schottky contact multilayered structure on the same diamond substrate. The thickness of the active volume of <math>\Delta\text{E}</math> and E stages are about 2 <math>\mu\text{m}</math> and 500 <math>\mu\text{m}</math>, respectively.</p> <p data-bbox="358 1041 1156 1270">The diamond telescope was tested in coincidence mode under <math>\alpha</math>-particle irradiation, which energy was varied from approximately 0.5 MeV to 5.5 MeV. The data were analysed by means of nuclear simulation program SRIM including the diamond telescope structure and the experimental set-up. A good agreement between the experimental and simulation results as well as a good detector performance were found in terms of energy resolution and charge collection efficiency. A small cross-talk effect between the two <math>\Delta\text{E}</math> and E detectors due to the common boron doped diamond ground layer was also observed. Nevertheless, the developed prototype can be suitable to identify charged particles and nuclear fragments.</p>
<b>T.1-D.1-O.9</b>	<b>CHARACTERIZATION OF CARBON COMPOUNDS FROM BINDER AND PLASTICIZERS OF EXPLOSIVES</b>
11.40 a.m. - 12.05 a.m.	<p data-bbox="358 1365 1147 1390">Chiara Telloli<sup>1</sup>, Antonietta Rizzo<sup>1</sup>, Alberto Ubaldini<sup>1</sup>, Giuseppe Ottaviano<sup>1</sup>, Stefano Salvi<sup>1</sup></p> <p data-bbox="358 1397 1156 1439"><i>1. ENEA, Bologna Research Center, Fusion and Technology for Nuclear Safety and Security Department, Nuclear Safety Security and Sustainability Division, via Martiri di Monte Sole 4, 40129, Bologna, Italy</i></p>

**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**

Chairpersons: Prof. Pasquale Gaudio, Prof. Prof. José Luis Pérez Díaz and Dr. Frank Duschek

DAY 1 - 10 December 2020

	<p>The characterization of binder and plasticizers of explosives from a bombing attack has become a forensic and international problem faced by many countries, but few of them have the technical expertise or have developed the methodology for the effective characterization of environmental impacts from site contamination. Explosives and related materials could remain in the environment causing different levels of contamination that can be toxic to ecological receptors. Also, the unexploded device could present international environmental problem due to the release of these materials (e.g. binder and plasticizers) due to their corrosion, in addition to the risks associated with the potential accidental detonation. Finding distinctive markers is crucial to identify the threat following up the emergency. Here we want to focus on the discrimination of the chemical fingerprint of the component of an explosives, coupling Raman spectrometry and specific isotopic ratio. The capability of Raman spectroscopy to characterize the composition of a chemical compound and the analysis of stable isotope ratios useful to identify specific markers of material origins and processes, is well known in materials science and in forensic investigations. The creation of a dedicated database of spectra and isotopic composition, with related advanced statistical tools to enable an expert interrogation of the database itself, is of paramount importance to enhance the possibility to solve the forensic questions and the challenges due to a bombing attack.</p> <p>The proposed configuration of double technique, coupled with a digital database and algorithms, could be useful to run analysis, with fast response time, in work environment related to emergency situations.</p>
<b>T.1-D.1-O.10</b>	<b>EU-SENSE – A MODERN CBRNE TOOL FOR IMPROVING THE SITUATIONAL AWARENESS OF FIRST RESPONDERS</b>
12.05 a.m. - 12.30 a.m.	<p><u>Łukasz Szklarski<sup>1</sup>, Patryk Maik<sup>1</sup>, Robert Sigg<sup>2</sup></u></p> <p><i>1. ITTI Sp. z o.o., 61-612 Poznań, Poland</i></p> <p><i>2. FOI, Totalförsvarets forskningsinstitut, 164 90 Stockholm, Sweden</i></p> <p>The terrorist groups around the world become more and more specialized with time, and their methods more sophisticated in the unending arms race with both military and civil defence. The threat of chemical weapons combines with the ever-present risk of industrial accidents involving chemical agents, calling for new solutions improving safety and efficiency and safety of task forces.</p> <p>The EU-SENSE consortium proposes a solution for improving the situational awareness of first responders in a form of modern CBRNe detection system. The project combines a novel network of heterogeneous sensor nodes, advanced data fusion algorithm, and various situational awareness modelling tools created under the system-of system approach. This paper intends to focus on the situational awareness aspects of the system, presenting thoroughly the Dispersion Modelling Tool, the Source Estimation Tool, and the Situational Awareness Tool. • The Hazard Prediction Tool runs FOI Dispersion Engine to perform air dispersion calculations to predict concentration levels following a chemical release described either directly by the SA tool or as calculated by the Source Estimation tool.</p> <ul style="list-style-type: none"> <li>• The Source Location Estimation Tool operates on an inverse version of the FOI Dispersion Engine together with an optimization algorithm to calculate the source's strength and position.</li> <li>• The Situational Awareness Tool serves as an access point to the system from the end user's perspective. The tool is responsible for managing the computations by preparing the necessary input data. The implemented graphical user interface allows for processing pipeline configuration as well as for the selection of the active components. The SA Tool enables manual control over the system, such as triggering hazard prediction with a pre-defined source location or raising and cancelling the alarms. The proposed system and its solutions are likely to greatly improve the capabilities and safety of the HAZMAT units and first responders in preparedness and response phases thanks to advances tools for situational awareness.</li> </ul>

**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**

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DAY 1 - 10 December 2020

T.1-D.1-O.11	<b>SAMPLING AND ANALYSIS OF CHEMICAL WARFARE AGENTS: IMPROVING IDENTIFICATION, THROUGHPUT AND RELIABILITY</b>
12.30 a.m. - 12.55 a.m.	<p data-bbox="355 251 683 274">Caroline Widdowson<sup>1</sup>, Helen Martin<sup>1</sup></p> <p data-bbox="355 283 522 307"><i>1. Markes International</i></p> <p data-bbox="355 316 1156 911">The acute toxicity of airborne chemical warfare agents (CWAs) requires sampling and detection systems that can identify trace levels of these compounds, potentially in complex matrices. This is a requirement both at military installations, and more recently for pre-emptive monitoring at key civilian locations. Online and offline methods have been developed and refined over the years, and recent advances in analytical hardware and software have enabled improved identification of compounds, increase workflow/throughput capabilities and greater flexibility in sampling methods. This presentation describes these advances in sampling and analytical technology for highly sensitive detection and confident identification of CWAs as well as explosives. Systems consist of either online or offline sampling, combined with innovative pre-concentration technology prior to separation by either one- or two-dimensional gas chromatography and detection via quadrupole or time-of-flight mass spectrometry. Online systems can enable continuous near real time analysis of many different environments, for example from mobile laboratories or deployed within civilian infrastructures of high population density, while offline systems can be used for routine screening and quick response to events. In addition, the presentation will discuss unique sampling devices for soil contamination and materials testing. Sampling systems such as the Micro-Chamber Thermal/Extractor (<math>\mu</math>-CTE) are used to identify compounds from a variety of contaminated sample matrices, including solid bulk samples (concrete, wood, plastic etc), metals, materials and fabrics which are either coated/uncoated to observe retention of or protection against agents. Specialised sampling devices such as the VOC-Mole soil probe can be used as a simple method of screening for volatile organic compounds in contaminated land from in-situ soil samples.</p>

**TECHNICAL TABLE 2. Epidemics, Medical Management and First Aid, Psychology**

Chairpersons: Prof. Leonardo Palombi, Prof. Amer Hosin and Prof. Vasilis Vasilou

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**TECHNICAL TABLE 2. Epidemics, Medical Management and First Aid, Psychology [10 December 2020, 02.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time), Virtual Room: Leonardo]**

<p><b>T.2-D.1-O.1</b></p>	<p><b>FIGHT AGAINST COVID: INTERVENTION OF THE BIOLOGICAL LIGHT FIELDABLE LABORATORY FOR EMERGENCIES (B-LIFE / UCLouvain) IN TURIN AND NOVARA, PIEDMONT, ITALY.</b></p>
<p>02.00 p.m - 02.25 p.m.</p>	<p><u>Jean-Luc Gala</u><sup>1</sup></p> <p>1. Center for Applied Molecular Technologies, Université catholique de Louvain (UCL-CTMA)</p> <p>From June 10 to July 23, 2020 the B-LiFE mobile laboratory of the UCLouvain set out to Piedmont Italy to provide assistance to the Italian authorities in combatting the Corona virus pandemic. This mission was supported by the European Space Agency which made available a budget of €1 million for this six-week deployment in two different locations. During this mission, the mobile laboratory tested more than 6000 first-line health workers (Croce Rossa Italiana), volunteers of the civil protection (Civile Protezione Italiana) and police (Carabinieri) services to assess their past and current exposure to the Coronavirus. The results provided real-time information on the exposition of these first responders to the SARS-CoV-2 when combatting the COVID. Based on very preliminary results, we observe that first responders from Novara, a region nearby the very much affected Lombardy, were more exposed than those working in more distant Turin. The antibody positive rate was twice as high in first responders from Novara as were those working in Turin; first responders from the Croce Rossa Italiana were obviously and globally more exposed to the coronavirus than first responders from Civile Protezione Italiana. The study successfully confirmed the feasibility of new key operational features determining the success or failure of such rapid intervention in the context of an ongoing major crisis acutely affecting a region or a country, whether inside or outside the European Union. Among those, the concept of mass screening of citizens by deployed mobile laboratories and the requirements for efficient interconnectivity of laboratory patient database with the host nation (Laboratory Information Management System – LIMS). The concept of scalability and interoperability was also demonstrated through the successful integration of French scientists from Pasteur Institute, Paris, and Italian scientists from the University of Torino, all trained by the B-LiFE team before joining them and working together.</p>
<p><b>T.2-D.1-O.2</b></p>	<p><b>PREVENTION PROCEDURES TO CONTAIN COVID-19 CONTAGION IN THE FIRST ITALIAN ARMY FIELD HOSPITAL</b></p>
<p>02.25 p.m - 02.50 p.m.</p>	<p><u>Gennaro Palermo</u><sup>1</sup>, <u>Paolo Pagliaro</u><sup>2</sup>, <u>Mario Ciccotti</u><sup>3</sup></p> <p>1. Chief Operating Room, Army Medical Center, Rome, Italy</p> <p>2. Department of Anesthesia and Resuscitation, Army Medical Center, Rome, Italy</p> <p>3. Joint Veteran Center, Scientific Department, Army Medical Center, Rome, Italy</p> <p>Background: The severe acute respiratory syndrome coronavirus (SARS-CoV-2) disease (COVID-19) outbreak in Italy saturated the public hospitals intensive care units in March 2020. The Ministry of Health asked for the Military Health Unit's intervention to deal with the emergency. The first COVID-19 Army field hospital in the world was thus built in Piacenza, Italy, to address the emergency.</p> <p>Objective: We aimed to describe the architecture of the field hospital and the preventive measures adopted to reduce COVID-19 contagion among the medical personnel working in emergency conditions in the military field hospital in Piacenza.</p> <p>Methods: The hospital project with the "H" shape divides the "dirty path" of entry for operators and patients from the "clean path" of exit for operators. Hypochlorite-based and alcohol-based solutions were used for personal protective equipment (PPE) decontamination before reuse.</p> <p>Results: Although exposed to 50 confirmed COVID patients for a total of 40 occupied beds, all primary care personnel tested negative to COVID-19, before the operation, 14 days after the first patient and 30 days after the closure of the military field hospital.</p>

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	<p>Due to the reported discomfort and its potential toxicity, the hypochlorite-based disinfection method was successfully substituted with the better tolerated alcohol-based disinfection solution, which displayed comparable effective results. Conclusion: The results of the present study pave the way for the creation of a protocol for future validation in larger studies aimed at providing guidelines in emergency conditions.</p>
<b>T.2-D.1-O.3</b>	<p><b>BIOLOGICAL RISK IN ITALIAN PRISONS: FROM THE COVID-19 MANAGEMENT TO THE DEVELOPMENT OF A NEW MODEL FOR EMERGENCY RESPONSE</b></p>
02.50 p.m - 03.15 p.m.	<p>Cristiano Franchi<sup>1</sup>, Fabrizio Ferri<sup>2</sup>, Stefania Moramarco<sup>1,3</sup>, Mariachiara Carestia<sup>1,3</sup></p> <p>1. <i>International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i>                  2. <i>Department of Infectious Diseases and Prison Health Service - Hospital "Belcolle" Viterbo</i>                  3. <i>Department of Biomedicine and Prevention, University of Rome Tor Vergata, Italy</i></p> <p>The Covid-19 pandemic is posing a series of challenges to health management in critical infrastructures such as the Italian Prison Service. This paper is aimed at proposing an integrated model of the response ability in respect to CBRNe events within the prisons. In particular, the study describes the managing and the technical features that have been implemented in the management of COVID-19, in accordance with the international and national legal framework and the organizational bodies that run the Italian Prisons Services. It shows the ability of the prison administration to satisfy almost completely WHO's technical and human rights recommendations and to deal within prison emergencies successfully both in terms of patients and deaths with respect to the external society epidemiology. In addition, we propose a draft of guidelines that involve both the National Health Service and the Prison Service to lead local prison facilities into drawing up their biological-incident contingency plan. A legal, standardized and approved plan could increase prison managers awareness, their self-confidence and response ability in the likelihood of any cases of disputes in order to be able to demonstrate that every endeavour has been taken and that "certified" practices have been put in place in accordance to the national standards.</p>
<b>T.2-D.1-O.4</b>	<p><b>THE IMPACT OF THE PATIENT'S STATE ON THE DESTINATION CARE UNIT CHOICE DURING A PRE-HOSPITAL HEALTH EMERGENCY</b></p>
03.15 p.m - 03.40 p.m.	<p>Ibtissam Khalfaoui<sup>1</sup> and Amar Hammouche<sup>2</sup></p> <p>1. <i>Mohammadia School of Engineers, department of industry, Mohamed V University, Rabat, Morocco</i>                  2. <i>PES, Research Team IMOSYS, department of Industry, Mohammadia School of Engineers, Mohamed V University, Rabat, Morocco</i></p> <p>In the health sector and in order to avoid life threatening situations, it is obvious that the patient's state of severity has a very strong impact on what the patient's transfer time should not exceed. In this article, we are interested in the dynamic evolution of these states of severity and the decision, to which Care Unit of destination (CUd) should the patient concerned be transferred as quickly as possible, may be most critical. In this sense, we present a model that allows us to conclude on the choice of the different candidate CUd to receive the patient, which considers both the qualification of the CU and the severity of the Occurrence of events of Health Emergency (OHE) in question.</p>
<b>T.2-D.1-O.5</b>	<p><b>VIROLOGICAL ENVIRONMENTAL ANALYSIS</b></p>
03.40 p.m - 04.05 p.m.	<p>Divizia Maurizio<sup>1</sup></p> <p>1. <i>Department of Biomedicine and Prevention, University of Rome Tor Vergata</i></p>

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	<p>The characteristics and conditions that determine the quality of the environment have always conditioned human health and the morbidity and mortality. The virological environmental analysis still represents a largely disregarded parameter in environmental analyses, although it is classified as a mandatory parameter for bathing water and an occasional parameter for drinking water.</p> <p>The latter include groundwater and mineral waters, surface waters, treated and untreated urban wastewater and seawater. It is only since 1950 that we started talking about viruses in waters defined as non-bacteria ". Epidemiological data have multiplied over the years thanks to the availability of new, more sensitive and rapid methods, such as molecular methods that are able to identify the viruses present (PCR) and quantify them (Real-time PCR). One of the first problems encountered in water analyzes is the time that elapses between the reporting of the epidemic and the virological analysis itself. In many cases the delay is so long that the classical methods are not able to identify the virus present at a low concentration. The enteric viruses present in the waters belong to 7-8 different families, in total over 100 serotypes. Overall, the virological analysis is based on three basic steps: sample collection, primary and secondary concentration and the isolation of viruses on cell systems. Unfortunately, not all enteric viruses grow on cell systems like Norwalk. For the latter, only molecular systems can be used. All this explains why, over the years, researchers have focused attention on microorganisms to be considered indicators of the viral presence as is the case for bacterial indicators in the analysis of the potability of water intended for human consumption</p>
<p><b>T.2-D.1-O.6</b></p>	<p><b>PERFORMANCE ASSESSMENT OF COVID-19 SANITARY WASTE MANAGEMENT DONE IN THE KINGDOM OF SPAIN</b></p>
<p>04.05 p.m - 04.30 p.m.</p>	<p><u>Quiñones Javier<sup>1</sup>, Galvez Jesús<sup>1</sup>, Serrano Julio<sup>1</sup>, Romero José Salvador Romero<sup>1</sup></u></p> <p><i>1. Guardia Civil. Interior Affairs Ministry. C/ Batalla del Salado, 32. 28045 – Madrid. Kingdom of Spain</i></p> <p>In the Kingdom of Spain, the COVID-19 pandemic had had a great impact in our Society, i.e., to the risks to the health of people when they suffer from the disease. However, there are other factors which increase health risks, such as the management of waste generated by the illness and/or whole material used in its treatment.</p> <p>Guardia Civil, specifically SEPRONA, has the labour skills of protection of the environment and the health of people. This paper is focussed in the previous performance analysis carried out on the management of sanitary waste and the findings of the different inspections done during RETROVIRUS operation.</p> <p>Performance assessment of the management of sanitary waste must take into account the following factors: lethality, regulation of waste management and prevention of occupational risks, procedures for their management (packing, transport, treatment and repository), training of workers, volume of waste to manage, etc. One of the factors that most conditions the risks is that sanitary waste (category II) due to could contain SARS-COV-2 virus, was reclassified in the middle of the pandemic as category III. This fact together with the amount of waste generated induced an increase of risk linked to operations done with this waste.</p> <p>In this paper is presented a review of the different scenarios detected during RETROVIRUS operation in the Kingdom of Spain. The scenarios selected including the packing, transport, treatment and repository operation done with COVID sanitary waste. Main conclusion of these operations is that one of the factors that has higher influence in the final risks linked the waste management is the training of the workers. Since, in most of the cases observed, the company are accustomed to handled sanitary waste – category 2 coming from the same producer and they dismiss the risk of this waste, due to the</p>



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	physical appearance of COVID sanitary waste and change of the category (3 instead of 2) from today to tomorrow.
<b>T.2-D.1-O.7</b>	<b>DECONTAMINATION OF AMBULANCE AND EQUIPMENT, A PROBLEM FOR WORKER SAFETY AND NATIONAL SECURITY</b>
04.30 p.m - 04.55 p.m.	<p>F. Rosiello<sup>1</sup>, L. Zelinotti<sup>2</sup>, M. Monti<sup>3</sup>, P. Cosmi<sup>4</sup>, M. Procacciantè<sup>4</sup>, G. Petrelli<sup>4</sup>, M. A. Vinci<sup>4</sup>, E. Doca<sup>5</sup>, E. Desideri<sup>6</sup>, M. Serale<sup>7</sup></p> <p>1. Ph.D. Student at Dipartimento di Scienze Anatomiche Istologiche Medico Legali e dell'Apparato Locomotore - Università la Sapienza di Roma</p> <p>2. Emergency management, Marino - Roma – Italia</p> <p>3. Emergency department - Assisi hospital, Via Muller 1, Assisi- Italy,</p> <p>4. Resident in Hygiene and Preventive Medicine – University of Rome Tor Vergata</p> <p>5. Pronto Soccorso, Casa di cura CDC – Sant'Anna – Città di Pomezia S.p.A</p> <p>6. CFSMG: Corso Formazione Specifica Medicina Generale - Regione Lazio (7) ASL Cuneo 1, Cuneo, Italy.</p> <p>Purpose: To analyze the cleaning and decontamination procedures of ambulance, equipment and clothes both in the routine and in a CBRNe event (epidemics, HazMats) and provide solutions to agencies to ensure patient health and operator safety at work. Background: In Italy, the cleaning of the ambulance, equipment and clothes is carried out by the operators themselves without standard or certified procedures, there isn't evidence of effective sterilization equal to the HACCP or laboratory tests. The sterilization of equipment is a utopia. Many ambulances 118 (new 112) do not have a station/garage, almost all don't have rooms for the sterilization systems of equipment such as autoclaves, containers for biological liquid waste, or where to wash the ambulances after each patient or washing machines. The working clothes are washed at home by the operators, in the same washing machines where they wash the family clothes. The schooling of the operators is medium-low (medium-high school), with few graduate figures (doctors and nurses), none of these figures has a specific competence in the cleaning of ambulances or equipment, in decontamination and in CBRNe. The National health system is fragmented in the Regions, privatization further fragments the system, controls are not very effective or absent. Method and materials: Study and analysis of "case studies", law and risks for workers and for rescued / transported people (patients) Finding: There are no standardized procedures at national level for the cleaning / sterilization / decontamination of ambulances, equipment and clothing used both in routine and in a CBRNe event. Conclusions: These lacks and the absence of standardization and procedures is a serious risk for both the health of the rescued people and the workers. Our solutions can give a solid starting point if accepted quickly by the bodies and by the State.</p>
<b>T.2-D.1-O.8</b>	<b>TOXICOLOGICAL ASPECTS AND MEDICAL MANAGEMENT OF INCAPACITATING CHEMICAL AGENTS' EXPOSURE IN CBRNE EVENTS: DEFINITION OF A PRACTICAL TOOL</b>
04.55 p.m - 05.20 p.m.	<p>Gallo Mariapina<sup>1,2</sup></p> <p>1. Poison Control Center, Papa Giovanni XXIII Hospital, piazza OMS, 1- 24127 Bergamo, Italy</p> <p>2. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</p> <p>The aim of this work is to elaborate a practical tool for the diagnosis, clinical management, and use of antidotes in patients exposed to incapacitating agents (ICAs). ICAs are chemical warfare agents designed not to injure or kill but to induce temporary physical and/or mental effects resulting in the inability of the affected individual to continue in their current duties or activities. Despite ICAs are described as non-lethal agents, when administered in high doses they can result in death or serious morbidity and</p>

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	<p>the use of antidotes may play a vital role. Therefore, due to their potentially lethal effects, the knowledge of the medical management and the use of antidotes of the intoxicated patients by ICAs is mandatory.</p> <p>The work will review the toxicological aspects and clinical effects of ICAs in order to elaborate a practical tool that will allow the diagnosis and the best treatment of poisoned pat.</p>
<b>T.2-D.1-O.9</b>	<p><b>INSTALLATION EFFECTIVENESS OF A UVC DISINFECTION SYSTEM IN AN HVAC FOR AN ICU DURING COVID-19 PANDEMIC</b></p>
05.20 p.m - 05.45 p.m.	<p>Susana O. Souza<sup>1</sup>, Antônio Américo Cardoso Junior<sup>2</sup>, Francesco d'Errico<sup>3,4</sup>, Aquiles Sales Craveiro Sarmento<sup>5</sup>, Mayk Rodolfo de Jesus Santana<sup>6</sup>, Rafael Ciro Marques Cavalcante<sup>6</sup></p> <p><i>1 Departamento de Física - Universidade Federal de Sergipe - 49100-000 São Cristóvão, SE, Brazil</i></p> <p><i>2 Departamento de Ciências Florestais - Universidade Federal de Sergipe - 49100-000 São Cristóvão, SE, Brazil</i></p> <p><i>3 Scuola di Ingegneria - Università di Pisa (UNIPi) - Pisa, Italy</i></p> <p><i>4 Yale Center for Emergency Preparedness and Disaster Response – Yale University - New Haven, CT, USA</i></p> <p><i>5 Empresa Brasileira de Serviços Hospitalares, Hospital Universitário de Lagarto 49400-000 Lagarto, SE, Brazil</i></p> <p><i>6 Departamento de Farmácia - Universidade Federal de Sergipe - 49400-000 Lagarto, SE, Brazil</i></p> <p>Ultraviolet germicidal irradiation (UVGI) uses short-wave ultraviolet (UVC) light to inactivate organisms like viruses, bacteria, and fungi. UVC inactivates a wide range of microorganisms by damaging the structure of nucleic acids and proteins at the molecular level, so they become unable to replicate and cause disease. Thus, UVC can improve indoor air quality by controlling bioaerosols and can be used as an engineering device to interrupt the transmission of pathogenic organisms and potential bioterrorism agents. Recently, the World Health Organization recognized that the COVID-19 virus could be transmitted across large distances, suggesting that indoor ventilation is key in airborne transmission. As a test for the future dissemination of UVC light installations to improve indoor air quality in Hospitals in Sergipe State, Brazil, we made the first installation of UVGI disinfection lamps, strategically placed in the Heating, Ventilating, and Air Conditioning (HVAC) system of the intensive care unit at the University Hospital of Lagarto, Federal University of Sergipe, Brazil. Six 15 W low vapor pressure mercury lamps emitting 253.7 nm UVGI were installed in the ducts of the fan coil, maximizing their luminous interaction in the air passage. One of the great advantages of this type of installation is that the lamps were completely covered, avoiding any risk of exposure of people and animals that may cause hazards. UVGI effectiveness depends primarily on the UV dose delivered to the microorganisms. With a UVC radiometer, we measured irradiance and evaluated the dose delivered to the air as a function of the distance. Microbiological tests were carried out to verify the germicidal effect, with the analysis of the viability of microorganisms that are circulating in the environment. In this conference, we present our encouraging results, demonstrating the effectiveness of the installation, suggesting that similar devices should be installed in HVAC systems to avoid biological risk to people inside buildings. In addition, this test gives us experience for other types of installation that can be used against more resistant microorganisms that may be used by terrorists in CBRNe events.</p>
<b>T.2-D.1-O.10</b>	<p><b>OPERATIONAL EXPERIENCE WITH THE COUNTERFOG® SDR-F05A+ FAST DISINFECTION SYSTEM</b></p>
05.45 p.m - 06.10 p.m.	<p>Pérez Díaz, José Luis (1); Sánchez García-Casarrubios, Juan (2); Méndez-Vigo Carranza, Pablo (3); Ruiz Navas, Elisa María (4); Cerrato Moreno, Sandra (5); Núñez Ortuño, Antonio</p>

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	<p>(6); Rodríguez Álvarez de Lara, Luis (6); Iliev Petrov, Mihayl (7); Martín Pérez, Tania (1); Fernández Perea, Gonzalo (1)</p> <p>(1)Universidad de Alcalá (UAH).  (2)SAN JORGE TECNOLÓGICAS S.L. (SJT).  (3)COUNTERFOG EBT DE LA UAH S.L. (COUNTERFOG).  (4)Universidad Carlos III de Madrid (UC3M)  (5)Cuerpo Nacional de Policía (CNP)  (6)Unidad Militar de Emergencias (UME)  (7)MAG SOAR S.L. (MAGSOAR).</p> <p>Volatile biological agents -like Anthrax or SARS-CoV2- are particularly elusive to conventional surface disinfection means. They easily soar if liquid disinfectant is sprayed on.</p> <p>COUNTERFOG® SDR-F05A+ is an equipment specifically designed to create dynamic nanometer-sized fog cones able to catch up and disinfect aerial agents either air-borne or laying on surfaces. A scarce use of liquid associated to the nanometric size of the droplets as well as the fast procedure are significant advantages as well for a fast disinfection of facilities, vehicles, etc. with a minimal environmental impact and disruption. In this work, practical application parameters and the experience of the Unidad Militar de Emergencias (UME) and Policía Nacional de Spain as end-users in real operational environment during the COVID-19 pandemic is presented. Times of deployment, application and recovery are estimated proving the usefulness of the equipment.</p>
<p><b>T.2-D.1-O.11</b></p>	<p><b>CULTURE COMPETENCE AND ETHICS IN EMERGENCY AND DISASTER SETTINGS</b></p>
<p>06.10 p.m - 06.35 p.m.</p>	<p>Amer Hosin<sup>1</sup> and Mohamed Alameri<sup>1</sup>  <i>Abu Dhabi Civil Defence Authority, Abu Dhabi, UAE</i></p> <p>This presentation is aiming to highlight the importance of culture competence training and awareness of ethical standards and code of practice for staff working in emergency and disaster missions nationally and internationally. The attempt shall discuss first the concept of culture shock and the challenges of emergency staff working in dissimilar culture/environment hit by disaster. Components of successful training and intercultural communication shall be addressed to assist emergency staff to deal with emergency situations. And therefore, enable staff to handle unfamiliar culture shock. Benefits of such training will be further highlighted to prepare staff for the challenges of new and dissimilar culture/environment.</p> <p>Staff of emergency settings and those who work in international relief missions and disasters should also be reminded of Ethical Standards and guiding principles/ codes of care in disaster situations. These guiding principles include obligations and duty of care, needs to respect and protect life, protecting privacy, avoiding control, avoid harm, protecting confidentiality, respecting freedom, setting priorities for pressing needs. Indeed be sensitive to values and culture norms of local population and hence protecting victims of disaster from further harm and/or control including abuse.</p>

**TECHNICAL TABLE 3. Cybersecurity, Critical Infrastructure, IoT and AI Investigation [10 December 2020, 02.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time), Virtual Room: Galileo]**

<b>T.3-D.1-O.1</b>	<b>ARTIFICIAL INTELLIGENCE TOWARD PREDICTIVE RISK PROFILING FOR MASS CASUALTY MANAGEMENT DURING CBRNE-EVENTS</b>
02.00 p.m - 02.25 p.m.	<p>Parag Chatterjee<sup>1,2</sup>, Leandro Cymberknop<sup>1</sup>, Ricardo Armentano<sup>1,2</sup></p> <p>1. <i>National Technological University, Buenos Aires, Argentina</i>                  2. <i>University of the Republic, Montevideo, Uruguay</i></p> <p>Medical emergencies constitute a quintessential component of most chemical, biological, radiological, nuclear and explosive (CBRNE) events. In a mass casualty during a CBRNE event, triage is strongly required for categorizing the casualties in accordance with medical care priorities. In this respect, having a comprehensive medical information of the casualties and other directly affected people would facilitate precise and fast treatments. In addition, the value of the data and its relationships between the health-risk profiles stand important for large-scale fast decision makings during a CBRNE-emergency as well, considering the vulnerability and existing risks of the affected cohort. The impact of Artificial Intelligence in predictive modelling has shown a strong impact in healthcare and allied domains. Extrapolating the power of predictive models, especially applied to casualties after CBRNE event, Artificial Intelligence could design predictive risk profiles of the cohort based on its vulnerability and other existing factors, accelerating the decision-making process in a larger scale, and furthermore, fortifying the treatments and emergency management systems.</p>
<b>T.3-D.1-O.2</b>	<b>CBRN SECURITY FOR CRITICAL INFRASTRUCTURE</b>
02.25 p.m - 02.50 p.m.	<p>Ram Athavale<sup>1,2</sup></p> <p>1. <i>Department of Defence &amp; Strategic Studies (DDSS), Savitribai Phule Pune University, Pune, India</i>                  2. <i>Raksha Shakti University, Gandhinagar, India</i></p> <p>Critical Infrastructure poses many challenges for CBRN security. There needs to be a focussed strategy to deal with such matters. Based on this strategy, specific security objectives will pan out. These will form the basics of configuring CBRN security. The essentials for these are discussed in succeeding paragraphs.</p> <p>Any infrastructure or system that has a essential bearing on the growth, sustenance and safety of a Nation is Critical Infrastructure. An incident leading to their incapacitation or destruction would have an adverse effect on national security, economic security and public health. A Deliberate or accidental release of/exposure to CBRN weapons or agents will have a devastating effect on such infrastructure and the multitude of people that use or work at these.</p> <p>CBRN Security Paradigm for Critical Infrastructure. Over the years guidance, standards and policies have evolved and cover a standard paradigm:</p> <ul style="list-style-type: none"> <li>• Threat Analysis and Vulnerability Assessment (TAVA)</li> <li>• CBRN Security Concept and Plan.</li> <li>• Detection, Identification and Early Warning</li> <li>• Incident Command Centre.</li> <li>• Practicing immediate Mitigation techniques.</li> <li>• Information Management and Resource Coordination.</li> <li>• Controlled and structured exit and evacuation plan</li> <li>• Mass decontamination and detoxification.</li> <li>• Training Philosophy and Responder Curriculum.</li> <li>• CBRN Security Audit.</li> <li>• Awareness Generation.</li> <li>• Comprehensive Management.</li> </ul> <p>In the event of an intentional CBRN incident, rapid response can reduce injury to people, damage to assets and disruption to operations. CBRN events call for synergistic actions by</p>

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	<p>many stakeholders to achieve optimal prevention or response. The threat to Critical Infrastructure has increased with rise in techno terrorism. While the focus should be on preventing a CBRN attack/incident, there is no denying the need to ensure adequate protection and response capability to be developed and incorporated.</p>
<b>T.3-D.1-O.3</b>	<p><b>AN AGENT-BASED MODEL TO SIMULATE HETEROGENEOUS CROWD FLOWS IN A CRITICAL INFRASTRUCTURE DURING EMERGENCIES REQUIRING AN EVACUATION</b></p>
02.50 p.m - 03.15 p.m.	<p><u>Umberto Battista</u><sup>1</sup>, <u>Pietro De Vito</u><sup>1</sup>, <u>Davide Ottonello</u><sup>1</sup></p> <p><i>1. Stam S.r.l.</i></p> <p>Large transport hubs are critical infrastructures, whose evolution has led indeed to a huge increase in daily users, both travellers and users spending their time in leisure activities. These places represent are also so-called "soft targets", accessible public spaces which are preferred targets of terrorist attacks because they provide terrorists with the opportunity to maximize casualties and publicity. Scope of this work is the development of a model able to simulate the flows and behaviours of heterogeneous crowds in a large transport hub, both in normal conditions and during an emergency, like a terrorist attack. During the study, several modelling approaches and solutions were also investigated and, among these, the agent-based modelling and the BDI (belief-desire-intention) architecture were selected for the scope. Several scenarios were identified, as a baseline to simulate the crowd behaviour. Flowcharts were developed to model users' actions, movements, services, and interactions with the environment (such as with trains); while statecharts were used to model emergency conditions and behavioural changes. A critical step has been data collection, not only from literature, but also from real-world observations, in order to: develop the general behaviour of users in the infrastructure, based on their final goal (e.g. take a train, do an interchange, spend time shopping, etc.); analyse the specific features of each category of user; together with the collection of the data about services and assets in the infrastructure investigated. Agent-based simulations were used to identify weak points and bottlenecks in the infrastructure; and to analyse the evacuation times in the case of an attack for each user category investigated, and from different areas. Finally, various solutions have been proposed, implemented and tested in the model, aimed at improving the crowd flows and reducing evacuation times for all categories of users. This work has been supported by the European Union's Internal Security Fund - Police, under Grant Agreement No 861727.</p>
<b>T.3-D.1-O.4</b>	<p><b>TRANSTUN – "TRANSnational TUNnel operational CBRN risk mitigation"</b></p>
03.15 p.m - 03.40 p.m.	<p><u>Federico Benolli</u><sup>1</sup>, <u>Marta Di Giacinto</u><sup>2</sup>, TRANSTUN Staff</p> <p><i>TRANSTUN STAFF: Federico Benolli<sup>1</sup>, Silvia d'Adda<sup>2</sup>, Alessandro d'Autillio<sup>3</sup>, Marta di Giacinto<sup>2</sup>, Daniele di Giovanni<sup>2</sup>, Ludovic Ouvry<sup>3</sup>, Carole Dougnac<sup>3</sup>, Juliette Vicaire<sup>3</sup>, Thierry Pollet<sup>3</sup>, Pierre Rodde<sup>3</sup>, Francois Besnehard<sup>4</sup>, Laurent Gabilly<sup>4</sup>, Mireille Lardiere<sup>4</sup>, Damien Tillet<sup>5</sup>, Jean Francois Armand<sup>5</sup>, Gilles Glin<sup>5</sup>, Arthur Lacroix<sup>6</sup>, Vincent Curie<sup>6</sup>, Maud Spirlet<sup>6</sup>, Nicholas Handford<sup>6</sup>, Jose Ignacio Cases<sup>7</sup>, Beatriz Viniegra<sup>7</sup>.</i></p> <p><i>1 SAFE</i></p> <p><i>2 Department of Industrial Engineering, University of Rome Tor Vergata (Italy)</i></p> <p><i>3 OUVRY</i></p> <p><i>4 HCL</i></p> <p><i>5 LOMBARDI</i></p> <p><i>6 B&amp;S</i></p> <p><i>7 NOVADAYS</i></p>

**TECHNICAL TABLE 3. Cybersecurity, Critical Infrastructure, IoT and AI Investigation**

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	<p>TRANSTUN is a public-private initiative which addresses the concrete CBRN risk of chemical events (connected or not to explosions and fires) within EU Cross-border tunnels. Engaging private operators and end-users from Belgium, France, Italy and Spain, TRANSTUN is improving the level of preparedness of tunnel operators, emergency responders, law enforcement agents, and Member States by defining, producing and testing operational guidelines designed to tackle the aftermath of a CBRN event. It is not only providing a platform to discuss and agree on minimum common standards (for processes and equipment) but also a live testing opportunity at a European Cross-border tunnel. As such, TRANSTUN is developing a network of operators tasked with responding to chemical accidents in a context characterized by the sharing of best practices/information and the development of a harmonised toolkit for Member States, operators and emergency responders. The goal of formalising and operationalising a network of security managers, tunnel operators, first responders and law enforcement for increased preparedness and response in the event of a CBRN accident/threat at a Cross-border tunnel of the EU, aims at increasing transborder resilience, coordination as well as communication between national authorities of different Member States through operational guidelines applicable throughout the EU.</p>
<p><b>T.3-D.1-O.5</b></p>	<p><b>ARTIFICIAL INTELLIGENCE AND FACIAL RECOGNITION IN AN IOT ECOSYSTEM: THE IMPACT ON DATA PROTECTION AND PRIVACY AND THE RELEVANCE OF ETHICS</b></p>
<p>03.40 p.m - 04.05 p.m.</p>	<p>Nicola Fabiano<sup>1,2</sup>  <i>1. Studio Legale Fabiano - Italy</i>  <i>2. International Institute of Informatics and Systemics (IIIS), Florida, USA</i></p> <p>In Europe, the European Commission in June 2018 appointed 52 experts to a High-Level Expert Group on Artificial Intelligence, comprising representatives from academia, civil society, as well as industry. On 11 September 2019, the Committee of Ministers of the Council of Europe set up an Ad Hoc Committee on Artificial Intelligence – CAHAJ. Very often, AI solutions are parts of an Internet of Things ecosystem where it is important to pay attention to data privacy and protection. Furthermore, it is essential also to consider Ethics as a crucial and fundamental approach. Apart from the technical solutions adopted or to be adopting, the topics related to facial recognition and Artificial Intelligence have a very high impact on the protection of personal data.</p> <p>It is worrying to read about facial recognition systems able to work starting from information related to a human face, comparing them with other data extracted from images existing on the web, and finally matching them recognising a person. What is Artificial Intelligence? Is it possible to define it? Is it an algorithm? These are only the main basic questions to start deepening this topic. Among the most critical issues, we certainly can refer to the risks related to human biases. Furthermore, any single technical solution has to respect the privacy by design principle to protect a natural person and the personal information belonging him or her. We should evaluate the impact of the emerging technologies on the natural person and, hence, on personal data. We cannot (rather, we have not to) avoid the development of innovative solutions, but, indeed, we have to monitor the impact of their effects on natural persons. Probably we do not need new legislation on Artificial Intelligence either new independent Authorities to control this sector. We only need to adopt a correct approach to face the solution using the current legal instruments that we already have.</p>
<p><b>T.3-D.1-O.6</b></p>	<p><b>EUPROTECT: DEVELOPMENT OF NEW SOLUTIONS FOR THE PROTECTION OF CITIZENS AND INFRASTRUCTURES AGAINST TERRORIST THREATS</b></p>
<p>04.05 p.m - 04.30 p.m.</p>	<p>Umberto Battista<sup>1</sup>, Riccardo Quaranta<sup>2</sup>, EUProtect Project Consortium<sup>3</sup>  <i>1) Stam S.r.l. (Italy)</i>  <i>2) University of Rome Tor Vergata (Italy), Department of Industrial Engineering</i></p>

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	<p>3) <i>Istituto Affari Internazionali (Italy), Metro de Madrid SA (Spain), APF Ingeniería (Spain), Paulinyi &amp; Partners Zrt. (Hungary)</i></p> <p>The worldwide rise of terrorism has been accompanied by a series of attacks against so-called “soft targets”, vulnerable public places that may be selected by terrorists in their effort to maximize casualties. Considerable attention has then been drawn to methods for enhancing the security of soft targets and providing protection to places that would otherwise remain fully unprotected. However, the characteristics of soft targets can range from public spaces with no protection to structures with some basic protection. As a result, solutions are urgently needed to protect public spaces in urban areas by structural, architectural and land shaping elements that are not recognized as protective elements by the public. The goal of EUProtect is to develop new concepts of urban landscape design aiming at reducing the vulnerability of public spaces against terrorist threats, taking into account the recent rapid changes in terrorism threats. Special care will be paid to citizens, through modelling and simulation of their behaviour in the event of terrorist attacks and virtual assessment of different protection measures. Best practice guidelines will be produced, aiming at providing advice to security stakeholders for reducing the risk of an attack and introducing proper measures for citizens and soft targets protection. Finally, the decision-making community will be addressed through a specific dissemination effort to enhance the awareness of terrorist threats and scenarios facing soft targets. EUProtect is a project funded by the European Commission, under the Internal Security Fund – Police (ISFP) 2018 Programme, with the grant number 861727. The consortium is composed of industrial and academic partners and includes the practitioners whose needs are at the core of the project. In this work we present the project objectives and structure, and the consortium.</p>
<p><b>T.3-D.1-O.7</b></p>	<p><b>CBRNe EVENTS AND FULL PROTECTION OF A CRITICAL INFRASTRUCTURE</b></p>
<p>04.30 p.m - 04.55 p.m.</p>	<p>Francesco Geri<sup>1,2</sup>, Daniele di Giovanni<sup>2</sup>, Francesco d’Errico<sup>3</sup>, Pasquale Gaudio<sup>2</sup>, Andrea Malizia<sup>2,4</sup>, and Andrea Chierici<sup>2,3</sup></p> <p><i>1 Italian Civil Protection</i></p> <p><i>2 Department of Industrial Engineering, University of Rome Tor Vergata (Italy)</i></p> <p><i>3 Department of Industrial and Civil Engineering, University of Pisa (Italy)</i></p> <p><i>4 Department of Biomedicine and Prevention, University of Rome Tor Vergata (Italy)</i></p> <p>The protection of a critical infrastructure (CI) is a collective task requiring close cooperation between CI managers and competent authorities at national, regional and local level. Critical infrastructure managers have the responsibility to ensure that their facilities are able to operate seamlessly. Furthermore, the combination of the complexity of the CI structure and the management complexity of a CBRNe event is such that the occurrence of CBRNe events has inevitable significant repercussions in other sectors which may be interdependent with the CI itself, greatly expanding the relapse domain of negative effects. This work aims to propose an iterative methodological process that allows to size and implement the measures of contrast and mitigation of CBRNe events on a CI and to integrate these measures into the Operator’s Safety Plan, which represents the critical event management tool for the CI itself.</p>
<p><b>T.3-D.1-O.8</b></p>	<p><b>A SURVEY OF SECURITY GAPS IN COLLABORATIVE UNMANNED AERIAL VEHICLES</b></p>
<p>04.55 p.m - 05.20 p.m.</p>	<p>M.Kayalvizhi<sup>1</sup>, S.Ramamoorthy<sup>1</sup></p> <p><i>1. Computer Science and Engineering Department, SRM University of Science and Technology Chennai, India</i></p> <p>In recent days, use of Unmanned Aerial Vehicles are growing rapidly in all fields, which is used to acquire imagery and environmental data for disaster research and management. It is also being extensively used in almost all fields like infrastructure maintenance, Military surveillance and in, like road maintenance and dam surveillance. Although UAV have some advantages, they are more vulnerable to cyber-attacks as they can be integrated with payloads equipped with sensors, high resolution cameras and launching missiles which collect sensitive data. In addition, unmanned devices will be an easy target for the</p>

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	<p>attackers, who can perform man-in-the-middle attack and gain control of the UAV. In this paper, the general study of UAV devices and its types, Wireless Sensor Network (WSN) are discussed. And then most common cyber-attacks that exist in UAV and then its impact on CIA triad are focused. An overview of Blockchain technology for maintaining data security in UAV networks in the context of surveillance is discussed. And the role of collaboration of UAV devices to reduce the individual overhead in UAV devices and its challenges are discussed.</p>
<p><b>T.3-D.1-O.9</b></p>	<p><b>BIG DATA FRAMEWORK WITH MACHINE LEARNING TOOLS FOR MASSIVE BIG PROGRAMS THE USAGE OF CLOUD COMPUTING</b></p>
<p>05.20 p.m - 05.45 p.m.</p>	<p><u>Anand Muni Mishra</u>, Vinay Gautam, Prabhjot Kaur  <i>1. Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India</i></p> <p>More recently, big data produces a lot of recognition. Agencies having large amounts of data and extract useful information from databases in which desired patterns and interrelationships can be discovered that cannot be understood by the human brain as the data volume range crosses our process. Big data also generated from divergent structured, un-structured and semi-structure resources. This paper concerns about a small review relationship between cloud and big data, as the two are important to each other. The most important emphasis of the paper is the description of the outline of big data, reduce map environment and various tools related to big data, which plays a very important role for handling huge data volumes. Machine learning was also explored, stating a touch from the virtualization concept and its associated algorithm. Cloud computing offers flexibility, core competitiveness, applications, related infrastructure technology and big data tools. Here in this paper, we have related to big data computations. Has also discussed various issues that need to be explored more and find the best solution using the best techniques.</p>
<p><b>T.3-D.1-O.10</b></p>	<p><b>CYBERTHREATS TO HOSPITALS. PANACEA: A TOOLKIT FOR CYBERSECURITY</b></p>
<p>05.45 p.m - 06.10 p.m.</p>	<p><u>Sabina Magalini</u><sup>1</sup>, Daniele Gui<sup>1</sup>, Pasquale Mari<sup>1</sup>, Matteo Meriardo<sup>2</sup>, Emmanouil G. Spanakis<sup>3</sup>, Rachele Brancaleoni<sup>1</sup>, Vangelis Sakkalis<sup>3</sup>  <i>1. Università Cattolica del Sacro Cuore</i>  <i>2. RHEA</i>  <i>3. Foundation for Research and Technology - Institute of Computer Science</i></p> <p>Digitization of health processes at any level (e.g. clinical, administrative) and delivery of health services through ICT is emerging as a necessity for healthcare organizations, while digital technologies (e.g., Big data analytics, IoT/Medical-Devices, AI, High-Performance/Cloud/Mobile Computing and Block-chain) change the way healthcare services are being delivered. Furthermore, healthcare systems need to respond to the increased visibility and availability of information through digital health interventions. Healthcare represents one of the most complicated and critical emergency response infrastructures. Cyberattacks or disruptive incident emergency and/or disasters, may have significant effects on the provision of health services. Thus, the obligation of adopting concrete measures that will strengthen a healthcare setting's including cybersecurity structures and capabilities, not only for protecting services, data and infrastructures, but also for patient trust and safety is of paramount importance. The penetration of ICT and the increasing connectivity of devices leads to a growing dependency making evident that threats and potential damages to healthcare organizations require a fortification of the infrastructure considering the complexity of the healthcare sector related to the number and diversity of its basic components (human resources, clinical/administrative information systems and processes, and devices) and existing security policies. The purpose of this work is to present a methodological cybersecurity toolkit (PANACEA) for cyber security assessment and preparedness of Healthcare ICT infrastructures and connected devices. PANACEA aims to empower the healthcare sector to respond more swiftly to risks of a complex and multi-faceted threat landscape while fostering positive</p>



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	<p>behavioural changes. PANACEA enables healthcare to assess the nature and severity of a threat, and sustainably decide to adopt strategies to strengthen its preparedness and response. Instead of waiting for the regulations that will be issued by central governments, HCCs can effectively be empowered to adapt their cyber resilience.</p>
<b>T.3-D.1-O.11</b>	<b>TRUSTWORTHINESS OF MACHINE LEARNING AND COMPUTER VISION IN GESTURE RECOGNITION</b>
06.10 p.m - 06.35 p.m.	<p><u>Anthony Ijeh</u><sup>1</sup></p> <p>1. CCG</p> <p>Forensic scientists find it challenging to prove homicidal drowning and this can lead to investigations being concluded as tragic accidents. With no broad prevention initiatives besides traditional lifeguard search and rescue and developing stronger water competencies, drowning continues to claim 500,000 lives annually worldwide. This paper presents an evaluation of the trustworthiness of machine learning and computer vision used in the development of a prototype. The prototype uses machine learning and computer vision to recognise gestures of a drowning victim. Trustworthiness in critical systems is vital if services which save lives are to be relied upon. Evaluation and testing of the prototype against datasets for performance and behaviour revealed recognition of gestures would vary from victim to victim.</p>
<b>T.3-D.1-O.12</b>	<b>CBRN BORDER MANAGEMENT</b>
02.25 p.m - 02.50 p.m.	<p><u>Ram Athavale</u><sup>1,2</sup></p> <p>1. Department of Defence &amp; Strategic Studies (DDSS), Savitribai Phule Pune University, Pune, India</p> <p>2. Raksha Shakti University, Gandhinagar, India</p> <p>Managing National Borders is a complex mechanism. Various agencies from Armed Forces, Police, Coast Guard, Paramilitary forces and Customs are engaged in securing the borders. Optimal management of movement of personnel and goods across borders within agreed upon protocols and treaties is necessary to maintain sovereign integrity, safety and security. International Protocols and Obligations. Most nations are signatories to a range of international protocols, treaties and organisations that mandate strict monitoring and control of CBRN material. Strong Domestic Legislation. It is essential to develop and institute strong domestic legislations to check movement of CBRN materials across borders. Such legislations should be compatible to those of the neighbours and International agreements and treaties so as to avoid loopholes for malafide movement of CBRN materials. Vigilance. Round the clock vigilance is essential along the borders to detect and check any legal or illegal handling of CBRN material. Technology allows us to institute surveillance of borders by use of ground based sensors, aerial vigilance and stand-off detection systems. Manning the Borders. The border management team consists of Border police, customs, and immigration and in some cases intelligence and army/coast guard elements. There is a need on common compatible training and equipping of all these personnel in dealing with CBRN materials. Back up Support. These teams should be backed up by trained specialist staff for CBRN incident management. These back up CBRN Teams should also be well equipped for all CBRN eventualities. In addition, adequate laboratory and forensic capability should be developed to support agent identification and analysis.</p> <p>Illicit trafficking of arms and munitions coupled with CBRN and dual-use goods is a global problem and needs urgent attention. Effective regulation, export controls and border management, including legislative and enforcement measures, can minimize such risks.</p>

**TECHNICAL TABLE 4. Radioactive and Nuclear threats [10 December 2020, 02.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time), Virtual Room: Archimede]**

<b>T.4-D.1-O.1</b>	<b>EMERGENCY MANAGEMENT EXPERIENCE WITH A GAMMA-RAY DOSIMETER FOR THE FUKUSHIMA GENERAL PUBLIC</b>
02.00 p.m - 02.25 p.m.	<p><b>Ryoichi Suzuki<sup>1</sup>, Hiroyuki Ohguchi<sup>2</sup>, Francesco d'Errico<sup>3</sup></b></p> <p><i>1National Institute of Advanced Industrial Science and Technology, Tsukuba, Ibaraki, Japan</i>  <i>2Chiyoda Technol Corporation. Oarai, Ibaraki, Japan</i>  <i>3Scuola di Ingegneria, Università di Pisa</i></p> <p>Following the accident on March 11, 2011, caused by the Great East Japan Earthquake and Tsunami at the Fukushima Nuclear Power Plant, Chiyoda Technol developed and distributed a compact gamma-ray personal dosimeter to the population in the affected areas. Chiyoda Technol collaborated with the National Institute of Advanced Industrial Science and Technology (AIST) to develop an accessible dosimeter for those who remained in the surrounding area and who were at risk of radiation exposure. The dosimeter is light, compact, and easy to carry and use to check the daily dose and the total accumulated dose. A dedicated workstation displays the dose graphically for easy comprehension. The tool proved invaluable in managing the consequences and fighting the public anxiety caused by the accident. The experience gained from developing and distributing this technology as an emergency management tool will be discussed in this presentation.</p>
<b>T.4-D.1-O.2</b>	<b>WHAT WE CAN LEARN FROM NUCLEAR EMERGENCIES?</b>
02.25 p.m - 02.50 p.m.	<p><b>Pierre Kockerols<sup>1</sup></b></p> <p><i>1. European Commission - DG Joint Research Centre (JRC)</i></p> <p>There is much to learn from industrial disasters and their consequences for public and environment. By way of example, the history of the major nuclear accidents tells us - from Three Mile Island to Chernobyl and later Fukushima - how the perception of the overall safety of the nuclear installations and the risk for accidents changed over time. The lecture will explain these lessons learned from nuclear accidents and how they gradually emphasised the necessity to be actually prepared for any type of emergencies. Based on this example from the nuclear sector, the lecture will reflect on the prospects for a larger integration of knowledge and approaches regarding CBRN emergency management. It will inform on initiatives taken by the European Commission, as an example of this move towards integration, through the CBRN Centre of Excellence and the Disaster Risk Management Knowledge Centre.</p>
<b>T.4-D.1-O.3</b>	<b>PARTICIPATORY STAKEHOLDER PROCESSES AS A WAY TO STRENGTHEN THE PREPAREDNESS FOR POST-ACCIDENT MANAGEMENT AND RECOVERY IN SPAIN</b>
02.50 p.m - 03.15 p.m.	<p><b>M. Montero<sup>1</sup>, C. Trueba<sup>1</sup>, R. Sala<sup>1</sup>, B. García-Puerta<sup>1</sup></b></p> <p><i>1.CIEMAT – Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Madrid, Spain.</i></p>

#### TECHNICAL TABLE 4. Radioactive and Nuclear threats

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	<p>Stakeholder engagement is essential in the preparedness for post-accident management process and response after a nuclear or radiological emergency. Different participatory exercises with stakeholders, under the umbrella of European projects, as EURANOS, NERIS-TP or PREPARE, have been accomplished in Spain as part of such national process. The most recent experience has been performed under the framework of the CONFIDENCE (COping with uNcertainties For Improved modelling and DEcision making in Nuclear emergenCIes) project. A structured process of participation, combining scenario-based stakeholder discussion panels and a structured transnational stakeholder survey (Delphi study) has been used to analyse the involvement of the stakeholders in decision-making processes. The focus was set on the transition phase to deal with the post-accident consequences and the long-term recovery. In Spain, the panel on "The articulation of stakeholder participation in the process of preparation for nuclear or radiological post-accident recovery" was organised and conducted by CIEMAT. The main goal was to facilitate the engagement of relevant stakeholders in this process and identify the critical aspects and uncertainties that can arise during the transition phase, in order to better manage the consequences of the accident and plan the recovery. In addition, a two-round Delphi study targeting a larger sample of national stakeholders was conducted in parallel with the panel sessions. The panel discussions have brought out the complexity of the relationships among the actors involved in the decision-making when they confront their different views and preferences. In a complementary way, the Delphi technique provided a prioritization of such preferences and of those uncertainties perceived as more important in the transition phase. A summary of the results obtained from the work undertaken in Spain and the main conclusions for the national and European level are presented.</p>
<p><b>T.4-D.1-O.4</b></p>	<p><b>CHARACTERIZATION OF SYSTEMS FOR SPECTROMETRY MEASUREMENTS IN ENVIRONMENTAL MONITORING, SECURITY AND SAFETY APPLICATIONS</b></p>
<p>03.15 p.m - 03.40 p.m.</p>	<p><u>Matteo Corbo<sup>1</sup>, G. Mangiagalli<sup>1</sup>, M. Morichi<sup>1</sup>, E. Fanchini<sup>1</sup>, A. Pepperosa<sup>1</sup>, F. Rogo<sup>1</sup></u> <i>1. CAEN SpA - Spectroscopy Division - Via della Vetreria, 11, 55049 Viareggio LU</i></p> <p>Radiological measurements are one of the most sensitive measurement related to safety and security applications. When a detection system is deployed in the field, the real-time response has to be reliable to better evaluate the situation and its evolution, especially in case of accidents.</p> <p>The usual early alarm systems are based on counting detection system, usually dosimeters or plastic scintillators. In real life, one of the important features of these systems is the reaction in case of alarms. When an alarm occurs, there is the necessity to verify the alarm and identify the cause. For this reason, spectroscopic, or combined such as dosimetry and spectroscopy systems are becoming more and more important. To cover most of the environmental monitoring application is was created a family of autonomous and versatile radiological systems system to address multiple CONOPS (Concept of operations), the GAMON's.</p> <p>The choice of between different systems like spectroscopic or dosimetry sensors with temperature compensation of the energy spectra and high rate compensation. These elements can be easily combined to different sensors, automation of the procedures, measurement and alarm reporting, enclosure type (underwater, IP68, drone shell), fast alarms reporting, and diagnosis reports mostly depends on the application. The most important characteristics of these automated systems is the capability to detect, identify and quantify the radiological threat. To achieve the required performances, it is important to fully characterize all the element of the systems. In this paper will be described the laboratory tests done to validate performances of an automated system in harsh environments and its detection and alarming performances. The analysis will cover the temperature compensation algorithm and underwater measurements performed to validate the equipment for each application. Other than the characterization of the sensors, a review of the characterization process and the application in different application will be presented.</p>

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<b>T.4-D.1-O.5</b>	<b>LOW-COST RADIATION MONITORING THROUGH DRONES DURING EMERGENCIES</b>
03.40 p.m - 04.05 p.m.	<p><b>Andrea Chierici<sup>1,2</sup>, Andrea Malizia<sup>2,3</sup>, Daniele di Giovanni<sup>1</sup>, Pasquale Gaudio<sup>1</sup> and Francesco d'Errico<sup>2</sup></b></p> <p><i><sup>1</sup> Department of Industrial Engineering, University of Rome Tor Vergata (Italy)</i></p> <p><i><sup>2</sup> Department of Industrial and Civil Engineering, University of Pisa (Italy)</i></p> <p><i><sup>3</sup> Department of Biomedicine and Prevention, University of Rome Tor Vergata (Italy)</i></p> <p>Collection of information concerning the release of ionizing radiation in response to Radiological and Nuclear (RN) events is mainly limited by the vulnerability of static sensor networks and the safety of human data gatherers. The release of ionizing radiation may also be accompanied by the presence of Chemical and Biological hazardous agents, further increasing the need for systems which allow first responders to carry out sample and detection duties in a remote and safe way. A remotely controlled drone able to combine both locational and radiological data may be an appropriate and efficient solution for emergency responders, enabling them to safely assess the requirements to perform operations in the crater area. The goal of this project was to demonstrate the feasibility of designing a prototype radiation detection unmanned aerial vehicle (UAV) system to safely identify irradiated areas in the event of a Radiological and Nuclear emergency. The UAV platform for this project is based on a [insert model], a [insert features], developed by [insert company]. While complete and fully integrated radiation detection units are already available on the market, they are usually expensive; therefore, they are not suitable to be disposed off after a few uses or to be employed in large numbers. The development work consists in several steps starting from the selection of the sensors, the required hardware, and the algorithms needed to process the collected data, moving to the integration and subsequent validation of the system. Specifically, the detection system is designed around affordable Cs(Tl) scintillation detectors and inexpensive microcontrollers and single board computers. Moreover, scintillation pulses are processed by means of a Time over Threshold (ToT) technique, therefore minimizing the complexity of the electronics needed on board. The main tasks in this project includes programming microcontrollers to communicate with the radiation detectors and the single board computers, building housings for both the circuit boards, characterizing the detection and acquisition system in response to known radioactive sources, and validating the algorithms for data processing. Upon project completion, a prototype system may be adapted into a system suitable for commercial or governmental use.</p>
<b>T.4-D.1-O.6</b>	<b>SIMULATION OF A PORTABLE ACTIVE INTERROGATION SYSTEM FOR THE INTERDICTION OF SPECIAL NUCLEAR MATERIALS</b>
04.05 p.m - 04.30 p.m.	<p><b>Anderson V. S. Alves<sup>1</sup>, Giuseppe Felici<sup>2</sup>, Francesco d'Errico<sup>1,2,3</sup></b></p> <p><i><sup>1</sup>Yale University, New Haven CT, USA</i></p> <p><i><sup>2</sup>S.I.T. - Sordina IORT Technologies S.p.A., Vicenza, Italy</i></p> <p><i><sup>3</sup>Università di Pisa, Scuola di Ingegneria, Pisa, Italy</i></p>

**TECHNICAL TABLE 4. Radioactive and Nuclear threats**

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	<p>Special nuclear materials hidden in shipping containers are extremely difficult to detect through their faint spontaneous emission of neutrons and photons. R&amp;D efforts focus on active interrogation (AI) techniques, employing external beams of neutrons or high-energy X-rays to first trigger fission reactions and then detect prompt or delayed neutrons and/or photons. Our group created a complete active interrogation system based on detectors developed by the universities of Pisa and Yale and on an ultra-compact linear accelerator (LINAC). The detectors contain liquid droplets that vaporize when exposed to fast neutrons but are insensitive to X-rays. The X-ray generator is based on 9 MeV electron LINAC developed by S.I.T. Sordina S.p.A. for intraoperative radiotherapy. Copper is used both as X-ray production target and as collimator, which prevents the production of photo-neutrons. With this system, we detected depleted uranium, while excluding significant production of contaminant photo-neutrons. In parallel to the experimental activities, the response our detector systems is assessed using Monte Carlo simulations of the active interrogation of cargo containers with 9 MV high-energy X-rays. The LINAC source is transportable on a small vehicle, and photon collimation is obtained with a copper collimator [d'Errico et al, 2018]. This system is illustrative of a host of real-world scenarios of interest to nonproliferation and homeland security, namely active interrogation at standoff. The LINAC model is coupled with the Monte Carlo model developed at PNNL of a large cargo vehicle filled with standard wooden cargo boxes and pallets [Robinson et al, 2005], which can be filled with a variety of materials. Materials of disparate densities, hydrogen content and atomic number, such as air, polyethylene and concrete are considered, and modeled. Thanks to these simulations, we will also explore the possibility of using multiple thresholds for the discrimination of fission neutrons against neutron from (a,n) or (g,n) sources [Apfel et al, 1997].</p> <p>- Apfel R.E., d'Errico F., Martin J.D. Fast discrimination of neutrons from (a-n) and fission sources. Radiat. Prot. Dosis. 70(1-4) 113-116 (1997). - d'Errico, F., Felici G., Chierici A., and Zagarella R. Detection of special nuclear material with a transportable active interrogation system. The European Physical Journal Plus, 133:451-460 (2018) - Robinson S.M., Kouzes R., McConn Jr. R.J., Pagh R., Schweppe J.E., and Siciliano E.R., Creation of Realistic Radiation Transport Models of Radiation Portal Monitors for Homeland Security Purposes. 2005 IEEE Nuclear Science Symposium Conference Record. 1014-1018 (2005).</p>
<p><b>T.4-D.1-O.7</b></p>	<p><b>SIMPLIFIED APPROACH FOR PRELIMINARY EVALUATION OF EFFECTIVE DOSE RATE FOR FIELD APPLICATIONS OF D-T NEUTRON GENERATORS</b></p>
<p>04.30 p.m - 04.55 p.m.</p>	<p>Contessa G.M.<sup>1</sup>, Cherubini N.<sup>1</sup>, Gandolfo G.<sup>1</sup>, Lepore L.<sup>1</sup>, Marzo G.<sup>1</sup>, Remetti R.<sup>2</sup></p> <p>1. Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Department of Fusion and Nuclear Safety Technology, Via Enrico Fermi 45, 00044 Frascati (Rome), Italy 2. Sapienza University of Rome, Department of Basic and Applied Sciences for Engineering, Via Antonio Scarpa 14, 00161 Rome, Italy</p> <p>Portable neutron generators are one of the most widespread sources of fast neutrons for different kind of analytical applications, ranging from classic activation analysis to the quantitative estimation of the fissile/fertile materials in radioactive wastes packages. Recently, new techniques based on neutron generators have been developed for homeland security, for instance neutron interrogations of packages suspected of containing illicit substances, such as explosives or drugs. However, when using portable generators determination of Radiation Protection quantities is affected by a series of boundary conditions that could differ from an experimental set-up to another, and Radiation Protection Experts cannot assess operators' exposure without the aid of time-expensive Monte Carlo simulations. As it is impossible to foresee all kind of scenarios involving such security applications, and time is often a critical variable, safety assessment requires faster, even if less accurate, tools for exposure evaluation. In this article experimental measurements of dose rates in a real scenario involving a D-T neutron generator operated in a concrete neutron bunker was considered, in order to validate the Monte Carlo model developed for the neutron generator. Consequently, it was possible to demonstrate that the calibration factor @14 MeV for</p>

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	<p>a neutron dosimeter gives always conservative results and to propose a stand-alone, fast, and easy to use deterministic calculation tool which is directly usable on field by the Radiation Protection Expert without the need of previous Monte Carlo calculations.</p>
<b>T.4-D.1-O.8</b>	<b>ENHANCED VIEWS IN EPR APPROACHES</b>
04.55 p.m - 05.20 p.m.	<p><u>Marie Claire Cantone</u>  <i>University of Milan, Via Pascal 36, 20133 Milan, Italy</i></p> <p>The analysis of lessons learnt from the experiences of previous radiological and nuclear emergencies offers the bases for improving emergency preparedness and response approaches, through research and development of various aspects, including e.g. dosimetry in emergency; all-hazards approach; non-radiological impact. In emergency, description of exposures is essential while deciding the implementation of an adequate level of protection. The dosimetry system is mainly addressed, in view of optimisation of protection, to effective dose in relation to stochastic effects. It has been recently envisaged (e.g. ICRP) to expand the dosimetry system to consider both stochastic effects and tissue reactions, with the specific characteristic of the exposed persons.</p> <p>There are unique aspects characterising radiological and nuclear EPR, however a similarity is identified across all sectors even facing different hazards. The incorporation of lessons learnt, e.g. related to evacuation cases in non-nuclear events, can contribute to raise the effectiveness of similar actions around NPPs, in case of accidents. It has been underlined (e.g. NEA, IAEA) the value to promote a more comprehensive domain of all-hazards emergency planning, in enhancing existing preparedness capabilities. e.g. in extending the understanding of factors supporting effectiveness of response actions as those factors which can degrade the response.</p> <p>An analysis of the non-radiological impact in managing radiological and nuclear events evidences the need for extending the scope of the preparation to emergency (e.g. ICRP, WHO, NEA). In the evaluation of the response actions, the justification of decision in considering to do better than harm, and the optimization of protection to reduce harm as low as reasonably achievable, need to be related to both radiological and non-radiological impacts. Preparedness and response to nuclear emergency requires to include considerations going beyond just radiation effects, as non-radiological health effects and social consequences.</p>
<b>T.4-D.1-O.9</b>	<b>HOW TO IMPROVE PREPAREDNESS TO EMERGENCIES AND POST-ACCIDENTAL RESPONSE? ADAPTING THE SHAMISEN RECOMMENDATIONS TO OTHER TYPES OF EMERGENCIES</b>
05.20 p.m - 05.45 p.m.	<p><u>Liudmila Liutsko<sup>1,3</sup>, Deborah Oughton<sup>4</sup>, Adelaida Sarukhan<sup>1</sup> and Elisabeth Cardis<sup>2,3</sup></u></p> <p><i>1. ISGlobal – The Barcelona Institute for Global Health, Spain</i>  <i>2. UPF – Universitat Pompeu i Fabra, Spain</i>  <i>3. CIBERESP – Consorcio de Investigación Biomédica en Red de Epidemiología y Salud Pública, Spain</i>  <i>4. NMBU – Norwegian University of Life Sciences, Norway</i></p>

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	<p>The SHAMISEN project (Nuclear Emergency Situations - Improvement of Dosimetric, Medical And Health Surveillance) concluded with 28 recommendations to better prepare and respond to radiation emergencies, based on lessons learnt from past nuclear accidents. For the first time, the SHAMISEN recommendations focused on optimal decision-making processes that not only consider technical issues (direct effects of radiation), but also socio-economic, psychological and ethical dimensions. Learning from past experiences involves more than gathering evidence: it relies on a critical evaluation of lessons learned, bringing together scientists from many disciplines (including social sciences) in order to integrate technical implementation issues, scope of the accident-related contamination, needs of affected populations, and societal and ethical challenges. Recommendations cover five main topics: health surveillance and epidemiological studies of populations affected by a radiation accident, evacuation, dose measurements, and training and communication with stakeholders and the general public. They are divided into general principles and sets of specific recommendations for before (preparedness) and after (early, intermediate and recovery phases) an accident. Ethical aspects are considered throughout, including the core principle of "doing more good than harm". The majority of the SHAMISEN recommendations can be easily translated to other types of disasters, including the current COVID19 pandemic. Most recommendations address common issues, such as those related to psychological stress and uncertainty; the need for adequate and transparent information; the importance of engaging local stakeholders and populations in data collection (environmental and/or health monitoring); and establishing mediators between professionals and general public to facilitate dialogue. Those specific to a radiation accident (dose measurements, radiation protection culture, etc.) can be adapted to the circumstances of interest. Funding: SHAMISEN was funded by OPERRA (Open Project for the European Radiation Research Area: FP7, grant agreement 604984).</p>
<p><b>T.4-D.1-O.10</b></p>	<p><b>STUDIES ON THE PROCESSES OF EMERGENCY RESPONSE AT THE FACILITIES OF THE ATOMIC-ENERGY COMPLEX</b></p>
<p>05.45 p.m - 06.10 p.m.</p>	<p>Maksym Kustov<sup>1</sup>, Volodymyr Kalugin<sup>1</sup>  <sup>1</sup>. National University of Civil Defence of Ukraine</p> <p>Studies on the processes of emergency response at the facilities of the atomic-energy complex with the release of gaseous and dispersed radioactive substances and hazardous materials into the atmosphere allowed us to develop a procedure for the practical implementation of this method. The emergency response method is aimed at precipitating hazardous radioactive substances from the atmosphere that enter the atmosphere during man-made accidents at nuclear power plants and other facilities for the storage and processing of radioactive substances. The presented procedure allows to solve three main tasks of liquidation of consequences of emergency situations - it is monitoring of the affected area, making effective management decisions and direct influence on the affected area from the emergency. The basis for making effective management decisions is to predict the dynamics of radiation contaminated zones, predict the intensity of precipitation with various methods of artificial precipitation and predict the effectiveness of precipitation effects on the dynamics of changes in contaminated areas. In order to expand the capabilities of existing methods for predicting pollution zones, their modification has been proposed taking into account the features of precipitation. Due to the use of artificial sedimentation methods, as provided for in the procedure, there is the possibility of precipitating dangerous radioactive substances from the atmosphere from a height of several kilometers, which cannot be implemented by other known methods. The developed method by artificially initiating precipitation are the basis for the development of a procedure for practical emergency rescue units during emergency response at regional and state levels. Thus, there is reason to believe that the use of the proposed procedure will improve the</p>

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	<p>efficiency of man-made emergency response operations with the release of hazardous radioactive substances to the atmosphere.</p>
<p><b>T.4-D.1-O.11</b></p>	<p><b>IN VIVO PUBLIC MONITORING IN EMERGENCY EXPOSURE SCENARIOS</b></p>
<p>06.10 p.m - 06.35 p.m.</p>	<p>Ignazio Vilardi<sup>1</sup>, Giuseppe Antonacci<sup>1</sup>, Paolo Battisti<sup>1</sup>, Carlo-Maria Castellani<sup>1</sup>, Luca Ciciani<sup>1</sup>, Alessandro Rizzo<sup>1</sup>, Luciano Sperandio<sup>1</sup></p> <p><i>1. Radiation Protection Institute, Italian Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Via Anguillarese 301, 00123 Casaccia-Rome, Italy</i></p> <p>In a nuclear or radiological accident scenario, where members of the public can be potentially internally contaminated by anthropogenic radionuclides released in atmosphere, tested procedures to be conducted in the field to fast scan a large number of individuals for internal contamination can play a major role to undertake appropriate countermeasures. At the ENEA Casaccia Research Center in Rome (Italy) a spectrometric monitoring procedure by means of a portable HpGe detector Trans-Spec-DX-100 has been tested in the field. The detector has been calibrated by using both a BOMAB (BOTTle Mannikin ABSorption) phantom, spiked with a known amount of a mix-radionuclide liquid source, and a neck phantom with different pairs of vials, sized for different ages, simulating the thyroid lobes, spiked with Ba-133. The detector has been tested to evaluate the procedure sensitivity for the most common fission and activation products in less than 200 seconds measurement. A total of 100 acquisitions of uncontaminated volunteers for the blank measurement have been collected, in particular 55 acquisitions on adult and 45 acquisitions on 10 y/o children. Acquisition spectra have been analyzed according to the Standard ISO 28218 for the detection limit calculation in terms of Bq and to the related minimum effective dose in terms of mSv, based on ICRP Publications 134 and 137. The measurement campaign has been performed in open field on a surface associated with the highest background (paved surface with an ambient dose equivalent H*(10) rate equal to 0.23 microSv/h), in order to study both the potentiality and the limitation of the technique. Results and evaluations of the measurement campaign are presented and discussed with a particular focus on the peculiar features of the technique, with respect to the aspects reported on the Council Directive 2013/59/Euratom, on the IAEA documents STI/PUB/1708 (2015) and EPR-NPP-OILs (2017) and to the techniques described in current literature.</p>



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T.5-D.1-O.1	CONSEQUENCE MANAGEMENT – A DOCTRINAL APPROACH
08.20 a.m. - 08.45 a.m.	<p><u>Bernd Allert<sup>1</sup></u> <i><sup>1</sup>Joint CBRN Defence Centre of Excellence (JCBRND COE), Vyškov/Czech Republic</i></p> <p>“NATO will ensure that Allies can protect their populations, forces, and territories by deterring, defending against, responding to, and mitigating the consequences of the full spectrum of the chemical, biological, radiological, and nuclear threats, including with trained and rapidly-deployable forces.” Brussels Summit Declaration issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Brussels, 11 - 12 July 2018</p> <p>Very often people confuse the terms “crisis management” and “consequence management”. NATO defined “crisis management” as “coordinated actions taken to defuse crises, prevent their escalation into an armed conflict and contain hostilities if they should result”. and “consequence management” as “actions taken to maintain or restore essential services and to lessen the effects of natural or man-made disasters”. In short, NATO’s political and strategic level manage a crisis, whilst its operational and tactical level take care of consequence management. NATO’s considers every stage of an adversary’s potential acquisition, intention and preparation to use, and employment of weapons of mass destruction (WMD). Up to now, the Alliance has responded to this challenge by addressing WMD proliferation, chemical, biological, radiological, and nuclear (CBRN) defence and consequence management.</p> <p>Allied Governments have primary sovereign responsibility to prepare for and mitigate the consequences of a CBRN incident. Their first responders should have the full range capabilities and capacities to identify, assess, and respond rapidly to an incident on their territory. However, NATO’s Comprehensive, Strategic-Level Policy for Preventing the Proliferation of WMD and Defending against CBRN Threats [1] endorsed at the 2009 Strasbourg/Kehl Summit confirmed that the Alliance will continue to enhance its capabilities to support consequence management. Furthermore, “NATO will be prepared to lend its capabilities to national authorities, if requested”. [1] In addition, Public Diplomacy and Strategic Communications will enable the provision of accurate, timely and credible information to the media, in the case of a CBRN incident and facilitate consequence management and recovery efforts by keeping the affected population informed.</p> <p>At the 2010 Lisbon Summit NATO’s Heads of States and Governments expressed their concerns about the proliferation of WMD, and their intention to continue to implement NATO’s Comprehensive, Strategic-Level Policy for Preventing the Proliferation of WMD and Defending against CBRN Threats. The North Atlantic Council (NAC) was tasked to assess and report on how NATO can better counter the proliferation of WMD and their means of delivery. [3] The report stated that progress has been made within NATO to address NATO civil-military interaction, especially regarding among others consequence management. NATO’s CBRN defence asset is the so-called Combined Joint CBRN Defence Task Force (CJ-CBRND-TF). The task force is designed for protection (CBRN defence and mitigation) and recovery (military support to CBRN consequence management). In 2017 NATO reaffirmed that key challenges to be addressed in the future implementation of the Policy include improving civil-military interaction to strengthen the Alliance’s preparedness, resilience and consequence management capacities admitting that CBRN consequence management is challenging and could turn into a costly and protracted effort requiring adequate resources. [5]</p>

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	<p>NATO's policies do not necessarily lead to actionable direction and guidance. NATO's Military Authorities (NMA's) should translate these policies into military concepts and doctrines. Various concepts and doctrines are detailing the role of CBRN defence forces in consequence management. MC 0603/1 NATO Comprehensive CBRN Defence Concept [4] defines as one of the key tasks to support subsequent consequence management operations. on a case by case basis and within existing means and capabilities. Consequence management operations are led by civilian authorities, military finds itself in a supporting role. MC 0603/1 provides details on potential capabilities along all enabling components of CBRN defence and along all lines of capability development. Other NATO concepts and doctrine contain likewise tiny pieces on consequent management, as well as the recently published "Non-binding guidelines for enhanced civil-military cooperation to deal with the consequences of large-scale CBRN events associated with terrorist attacks".</p> <p>To summarize, as of now NATO has not promulgated an Allied joint doctrine for consequence management as such. However, consequence management has been covered in various concepts, doctrines, and non-binding guidelines. Allied Command Transformation (ACT) recommended already in concepts and doctrines to "improve the NATO-EU partnership on non-proliferation and consequence management"[2]. If NATO's member nations decide to develop a comprehensive doctrine JCBRND COE stands ready to support them.</p> <p>References</p> <p>[1] C-M(2009)0048(INV) - NATO's Comprehensive, Strategic-Level Policy for Preventing the Proliferation of Weapons of Mass Destruction and Defending against Chemical, Biological, Radiological and Nuclear Threats, 31 March 2009.</p> <p>[2] ACT: Multiple Future Project – Navigating toward 2020, Final Report, April 2009.</p> <p>[3] C-M(2011)0041 – Lisbon Tasking to Assess and Report on how NATO Can Better Counter the Proliferation of Weapons of Mass Destruction and their Means of Delivery, 7 June 2011.</p> <p>[4] MC 0603/1 NATO Comprehensive CBRN Defence Concept, 26 May 2014.</p> <p>[5] C-M(2017)0028 – Implementation Report and Recommendations on NATO's Comprehensive Policy for Preventing the Proliferation of WMD and Defending against CBRN Threats, 26 June 2017.</p>
<p><b>T.5-D.1-O.2</b></p>	<p><b>ITALIAN ARMY CBRN DEFENSE 7TH CBRN DEFENSE REGIMENT: ROLE, CAPABILITIES AND OPERATIONS</b></p>
<p>08.45 a.m. - 09.10 a.m.</p>	<p><u>Federico Ceccaroli<sup>1</sup>, Daniele Del Gaudio<sup>1</sup></u></p> <p><i>1. Esercito Italiano, Largo Acquaroni n.24, Civitavecchia (Rome) 00053, Italy</i></p> <p>The 7th CBRN defense regiment "CREMONA" is the unique specialized unit of the Italian Army, equipped with peculiar systems and instruments, in charge of carrying out technical-specialist activities for the protection of national and Allied Forces against Chemical, Biological, Radiological and Nuclear threats and hazards. The regiment may also intervene in support of Italian Civil Defense agencies in case a CBRN attack or incident occurs on the national territory. The first part of the presentation covers the mission, capabilities and tasks of 7th CBRN defense regiment, while the second part focuses on training, preparation and operational activities conducted by the regiment operational assets</p>
<p><b>T.5-D.1-O.3</b></p>	<p><b>PROACTIVE PROJECT</b></p>
<p>09.10 a.m. - 09.35 a.m.</p>	<p><u>Dominic Kelly<sup>1</sup></u></p> <p><i>1. CBRNe Ltd</i></p>

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	<p>In line with the EU Action Plan H2020 Project PROACTIVE uses a Social Sciences and Humanities research approach to address the CBRNE terrorist threat under the topic SU-FACT01-2018-Open.</p> <p>Research shows during CBRNE events citizens interact with the First Responders differently from other types of major incidents. More than in other types of crises, citizens depend on the type of communication, tactics, techniques and technology employed by First Responders and others responsible for dealing with the incident. Project PROACTIVE will enhance societal CBRNE preparedness by increasing first responder's ability to effectively manage large, diverse groups of people and validate the needs and requirements of civil society, especially considering vulnerable citizen groups.</p> <p>PROACTIVE will carry out three exercises conducted jointly with H2020 Project eNOTICE (European Network Of CBRN Training Centers). At least one exercise will involve a railway scenario likely to be in Rieti, Italy. The exercises will include volunteers recruited by PROACTIVE in liaison with eNOTICE partners who will test the acceptability and usability of specific tools and procedures, potential new CBRNE specific instructions and guidance to citizens that could be integrated into existing (e.g. first aid) courses. Each exercise will be followed by an evaluation workshop.</p> <p>PROACTIVE will result in two tool kits: one for CBRNE practitioners and policy makers and one for civil society. The first toolkit will include a web collaborative platform with visual database scenarios for communication and exchange of best practice among LEAs as well as an innovative response tool such as a mobile app. The civil society toolkit will also include a mobile app adapted to various vulnerable citizen categories. These recommendations and tools will provide valuable inputs to the EUROPOL initiative to develop a knowledge hub on CBRN and will help consolidate the EU Action Plan to enhance preparedness against CBRN security risks.</p>
<b>T.5-D.1-O.4</b>	<b>CBRN INSTRUCTOR</b>
09.35 a.m. - 10.00 a.m.	Joelle Khadra <sup>1</sup> , Adolph Eid <sup>1</sup> and Ioannis Galatas <sup>1</sup>
	<p><i>Independent CBRNe expert</i></p> <p>Throughout history, the central role of women in society has ensured the stability, progress, long-term development of nations. Moreover, education is the key to a nation's ability to develop and achieve sustainability targets. Therefore, the role of women is at the front end of the chain of improvements, leading families, and communities to long-term sustainability. Whether they are housewives or hidden figures, women have changed the world with their enormous contributions to Science, Politics, Technology, Art, Sports, Entertainment, and Military. When a woman is trusted to lead emergency response and recovery processes, she builds her resilience and that of others under her care, enabling communities to recover faster from shocks and stress, and prepare for disasters before they occur. Strengthening women and their capabilities in the field of CBRN preparedness and response is a must. Moreover, it is well known that when we support a woman, we are supporting the whole community. Assisting and advising those with different social, cultural, and religious needs such as women wearing "hijab, abaya, burka, and saris" especially during decontamination process which comprises disrobing, showering, and re robing in front of strangers is crucial as it is taboo and against certain norms of societies due to religious believes. By separating them from other gender and using special techniques in the disrobing process (as they wear hijab, abaya etc.) this would be one of the major issues that would be tackled by Female First Responders, and would also eliminate the reluctance of their decontamination to maintain their privacy and dignity.</p>

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<b>T.5-D.1-O.5</b>	<b>ENOTICE - EUROPEAN NETWORK OF CBRN TRAINING CENTERS</b>
10.00 a.m. - 10.25 a.m.	<p data-bbox="391 238 683 262"><u>Olga Vybornova<sup>1</sup>, Jean-Luc Gala<sup>1</sup></u></p> <p data-bbox="391 269 1031 293"><i>1. Centre for Applied Molecular Technologies of Université catholique de Louvain (UCL-CTMA)</i></p> <p data-bbox="391 300 1125 560">eNOTICE is building a dynamic, functional and sustainable pan European network of CBRN Training Centres, testing and demonstration sites (CBRN TC), aiming at enhanced capacity building in training and users-driven innovation and research, based on well-identified needs. Such a network did not exist before, because it's difficult to find the existing CBRN TC, difficult to systematically describe their capacity and capability, and challenging to make them interested to work together at the EU level. It became possible with dedicated project, resources and the core of enthusiastic partners – training centers themselves. Putting TC in the centre of attention, the network facilitates interaction between civil and military practitioners of all disciplines, R&amp;D developers and policy makers.</p> <p data-bbox="391 567 1125 902">eNOTICE is working with multiple projects active in security research and innovation, as well as with the Community of Users for Secure, Safe and Resilient Societies of DG HOME to ensure the efficient dialogue between practitioners, technology suppliers and policy makers. The project has implemented the mechanism of pooling and optimizing resources – where practitioners, researchers, technology developers get to know each other and work together by means of demonstrating and testing technologies in training centres. Current R&amp;D projects have an opportunity to test their developments and receive feedback from practitioners of different disciplines during joint activities organised and hosted by training centres providing the projects with all the necessary facilities, practitioners for testing the technology, infrastructure, so that the projects don't have to spend any budget on hiring the fields for demonstrations and trials, but all stakeholders benefit from exercising together in training centres.</p> <p data-bbox="391 908 1125 1008">CBRN Training Centres act as perfect operational intermediary between all civilian and military CBRN actors, EU relevant bodies and policy-makers, and thus serve as the best cradle for expansion of a CBRN network of professionals in the frame of strengthened civil-military cooperation.</p>
<b>T.5-D.1-O.6</b>	<b>DNA RESISTANCE TO RADIATION FIELD. FORENSIC GENOTYPING IN A RADIOLOGICAL INCIDENT SCENARIO</b>
10.25 a.m. - 10.50 a.m.	<p data-bbox="391 1112 1125 1166"><u>Quiñones Javier<sup>1</sup>, Fernández Marta<sup>2</sup>, Mingorance Emiliano<sup>1</sup>, Serrano Julio<sup>1</sup>, Torres José Antonio<sup>1</sup>, Cobos José Manuel<sup>2</sup>, Amigo Luis Jesus<sup>2</sup></u></p> <p data-bbox="391 1172 1092 1195"><i>1. Guardia Civil. Interior Affairs Ministry. C/ Batalla del Salado, 32. 28045 – Madrid. Kingdom of Spain.</i></p> <p data-bbox="391 1201 873 1224"><i>2. CIEMAT. Avda. Complutense 40, 28040 – Madrid. Kingdom of Spain</i></p> <p data-bbox="391 1232 1125 1516">Nuclear forensic science has evolved in response to the growing illicit incidents related with radioactive or nuclear materials outside of regulatory control and its possible use in a malicious act. The ultimate goal of nuclear forensic discipline in an intentional incident involving these kinds of materials is the attribution. Therefore, a forensic study should be undertaken in a way that could answer the two main questions that are posed: the origin of the material and the identification of the human contribution in the event and the processes involved. The origin of the material is determined through its physical (e.g. morphology) and chemical characterisation (trace level composition, isotopic ratios, ...) although; clarifying the authorship requires the use of traditional forensic science disciplines such as DNA and fingerprints analysis.</p> <p data-bbox="391 1521 1125 1668">Since its appearance, nuclear forensic science is focused fundamentally on the studies and advances related to the characterization of materials, leaving as secondary until recent years the evaluation of classical forensic evidences. In the context of a terrorist scenario, the nature of the event itself causes on the potential probative samples being exposed to rugged environment effects that can impact on its successful analysis. So far, there have been relatively few investigations into</p>

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	<p>the impacts and effects of radioactivity (mostly electromagnetic radiation) on DNA samples and the consequences that exposure may have for the use of this evidence for identification purposes.</p> <p>Based on these facts, an experiment comprising the exposure to gamma radiation of whole blood samples at accumulated doses in the range of 10 - 1000 kGy was carried out. Afterward, DNA analysis of the irradiated samples using a normalized procedure (STR tests) was performed in order to assess the impact of sample degradation on forensic genotyping. Furthermore, in this paper is presented the method used for identification, in which the DNA results are input in the database for searching the personal profile and when, e.g., the dose amount, it is impossible to coupling with the person.</p>
<p><b>T.5-D.1-O.7</b></p>	<p><b>THE CBRN THREAT IN 21<sup>ST</sup> CENTURY - COUNTER THE PROLIFERATION OF WMD IN MARITIME DOMAIN</b></p>
<p>10.50 a.m. - 11.15 a.m.</p>	<p><u>Fabio Polidoro</u><sup>1</sup> <i><sup>1</sup>ITALIAN NAVY GENERAL STAFF, 7<sup>th</sup> DEPARTMENT "NAVAL SEA SYSTEM" – Damage Control &amp; CBRN Officer</i></p> <p>Shipping accounts for 90% of international trade and accounts for about 5% of the world economy with nearly \$380 billion in annual revenue.</p> <p>While more than 90% of goods are transported by sea, only an overage of 10-15% of the ships are inspected.</p> <p>The characteristics and dynamics through which most maritime traffic takes place are an element of vulnerability of the transport system: in this context, the action of terrorists finds the use of ships and containers a reliable and relatively safe tool, both for the clandestine transport of 'traditional' weapons, mass destruction devices, explosives and personnel and for the use of the same containers as weapons of mass destruction. The traffic of WMD takes place mainly by sea, in ships where it's easier to hide these materials, also exploiting some local laws of permissive or ambiguous States whose controls are often lacking, favoring such illegal traffic by sea, while air and road traffics are normally much more controlled by police authorities.</p> <p>In this context, the need to limit the proliferation of Weapons of Mass Destruction (or materials/items needed for their production) cannot fail to take into account the naval aspects.</p>
<p><b>T.5-D.1-O.8</b></p>	<p><b>HEART RATE VARIABILITY AS A PREDICTIVE TOOL IN SQUAD READINESS AND SAFETY</b></p>
<p>11.15 a.m. - 11.40 a.m.</p>	<p><u>Rui Jorge Palhoto Lucen</u><sup>1</sup> <i><sup>1</sup>Tenente Coronel de Cavalaria, AM SEDE Rua Gomes Freire1169-203 Lisboa, PORTUGAL</i></p> <p>Environmental conditions may be predictably extreme and severe, such as those in deserts, polar, alpine regions and deep ocean. Nevertheless, even in normal habitat conditions, individuals may be exposed to transitory, sometimes life-threatening, extreme conditions, due to their daily job activities. One such example, are the Advanced Chemical and Biological Reconnaissance Team from the Army Special Forces (ACBRT). Indeed, militaries in the ACBRT are exposed to extreme working conditions, due, not only to the dangerous nature of the job (permissive, uncertain, and hostile), but also to the characteristic military wearable, which ultimately leads to a dangerous rise in all vital physiological parameters, within short time, sometimes in hot climates up to 45°C. Therefore, real-time physiological status monitoring of these teams is crucial, to ensure individual and squad performance readiness and safety. Here in, we present an evaluation of an ACBRT simulation exercise. Heart rate (HR), Rating of perceived exertion (RPE; physical and mental) were measured and recorded continuously throughout the exercise. Heart Rate Variability (HRV) is a non-invasive tool used to assess autonomic regulation of the</p>

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	<p>heart and was analysed with the Fast Fourier Transform. The HRV profiles were assessed in the time and frequency domain and the cardiac interbeat intervals were recorded using and HR monitor throughout the exercise. The changes observed are indicative of a shift in the sympatho-vagal balance, towards a more pronounced sympathetic activity which varied according to the different roles in the ACBRT. Our results, even though not quite significant, considering the sample size, are a clear indicative of the possible use of HRV, as a predictive tool for both physical and mental performance assessment, including team readiness for the mission.</p>
<p><b>T.5-D.1-O.9</b></p>	<p><b>A PUBLIC SURVEY ON A SAMPLE OF ITALIAN POPULATION DURING COVID19 LOCKDOWN WITH ANALYSIS OF PERCEPTION OF THE EMERGENCY: COMMUNICATION, FAKE NEWS CIRCULATING, WORK OF HEALTH AND SECURITY PERSONNEL AND CENTRAL AND LOCAL GOVERNMENT</b></p>
<p>11.40 a.m. - 12.05 a.m.</p>	<p>Simone Nicola<sup>1</sup>, Ahmed Gamal Ibrahim<sup>2</sup>, Andrea Malizia<sup>3</sup>, Alba Iannotti<sup>4,5</sup>  <sup>1</sup>.CREA-IT and UNITOV/Master CBRNe  <sup>2</sup>.CBRN Academy  <sup>3</sup>.Department of Biomedicine and Prevention, University of Rome Tor Vergata  <sup>4</sup>.Department of Industrial Engineering, University of Rome Tor Vergata</p> <p>We analyzed feedbacks and results obtained in a public survey spread through social media (Facebook personal profiles, Facebook page, Google, Whatsapp) to better understand users' perception related to the effectiveness of official and not-official media channels, the perception related to fake news and the current circulating infodemic but also, more generally, the Italian response in fighting COVID19. The whole survey was composed of 24 questions not all of those were analyzed in this work. They are divided into: 3 questions on general data (age, gender, region of residence), 6 question with single answer, 3 questions with multiple choice answers, 11 questions with answers on a on ordinal rating scale (from 1 to 10), 1 open-ended question. The survey was in Italian, and the questions are made for italian people, but they can be rearranged for other countries as well. We got 351 answers in five days, partially randomized and normally distributed concerning gender and age.</p>
<p><b>T.5-D.1-O.10</b></p>	<p><b>COMPLEX EMERGENCY MANAGEMENT IN INTERNATIONAL CONTEXT</b></p>
<p>12.05 a.m. - 12.30 a.m.</p>	<p><u>Stefania Fiore</u><sup>1</sup>  <sup>1</sup>. Italian Fire and Rescue Service – Central Directorate for Emergency (Italy)</p> <p>Complex emergencies know no borders and can hit one or several countries simultaneously without warning. When these disasters strike, and the scale of an emergency overwhelms the response capabilities of a country, it can request international assistance: then response teams, technical equipment and other resources need to be deployed in the shortest time possible to support the response efforts. Having a well-coordinated joint response means a faster and more effective approach which is crucial in saving lives and minimising damage.</p>

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<b>T.5-D.1-O.11</b>	<b>THE DEPLOYMENT OF THE IT-CBRN TEAM IN LEBANON AFTER BEIRUT BLAST</b>
12.30 a.m. - 12.55 a.m.	<p><u>Stefania Fiore</u><sup>1</sup></p> <p><i>1. Italian Fire and Rescue Service – Central Directorate for Emergency (Italy)</i></p> <p>The intervention is related to the activities of the IT CBRN team within the "Lebanon Blast Emergency", activated and deployed to Beirut from 5 to 12 August 2020, following the request for assistance from the Lebanese authorities to the European Civil Protection Mechanism, through the Emergency Response Coordination Centre of DG ECHO - General Directorate for European Civil Protection and Humanitarian Aid Operations.</p> <p>The team was composed by CBRN experts from Italian Fire and Rescue Service, integrated with four CBRN experts from the Italian Army from the 7th CBRN Defense Regiment "Cremona" of Civitavecchia, with the mandate to support Lebanese experts in CBRN assessment and mitigation measures.</p>
<b>T.5-D.1-O.12</b>	<b>COUNTER-MINI/MICRO UAS PERSPECTIVE: SAFEGUARDING TROOPS AND INSTALLATIONS</b>
12.55 a.m. - 01.20 p.m.	<p><u>Giorgio Cozzolino</u><sup>1</sup> , <u>Savino Sculamieri</u><sup>2</sup></p> <p><i>1. Colonel, Director of the Center of Excellence Counter M/M UAS</i></p> <p><i>2. Major, Plans Section Chief of the Center of Excellence Counter M/M UAS</i></p> <p>The Center of Excellence Counter M/M UAS is the national reference center for the development and integration of capabilities and expertise in Countering the threat posed by Mini/Micro Unmanned Aircraft Systems. It contributes to the drafting of the national doctrine for the C-UAS and it's an Italian referent for international and NATO doctrine. It deals with basic Counter M/M UAS training for the army and the armed forces and collaborates in the verification and testing of new Counter M/M UAS systems. It follows and studies the UAS threat, its continuous evolution also in the field of CBRNe defense.</p>

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<b>T.6-D.1-O.1</b>	<b>RESPONDING TO CHEMICAL-WEAPONS TREATS: AN OPCW VIEW</b>
08.20 a.m. - 08.45 a.m.	<p>Joseph Ballard<sup>1</sup> <i>1. Senior Policy Adviser, Office of Strategy and Policy, Organisation for the Prohibition of Chemical Weapons</i></p> <p>The promise of the Chemical Weapons Convention (CWC), as set out in its preamble, is “to exclude completely the possibility of the use of chemical weapons, through the implementation of the provisions of this Convention”. In an age of increasing concerns about chemical terrorism and the security of toxic chemicals, how can the Technical Secretariat of the Organisation for the Prohibition of Chemical Weapons (OPCW), working with States Parties to the CWC, effectively deliver on that promise? Events of recent years have underlined the need for a nimble and broad international response to the evolving chemical-weapons threat, and the OPCW Technical Secretariat has a key role to play in that effort. As an organisation dedicated to supporting the implementation of the CWC, the OPCW Technical Secretariat has a number of tools at its disposal, including its capacity-building programmes, its rapid-response and scientific capabilities, and the CWC’s complex verification regime. This presentation will explore how the OPCW views threats to the international norm against chemical weapons and how its work is evolving to address those threats. It will cover the role of verification, national implementation and legal and regulatory frameworks, the security of vulnerable chemicals, and investigative and first-response capabilities.</p>
<b>T.6-D.1-O.2</b>	<b>HOW REAL IS THE THREAT OF TERRORIST USE OF WEAPONS OF MASS DESTRUCTION?</b>
08.45 a.m. - 09.10 a.m.	<p>Chalaris Michail<sup>1</sup> <i>1. International Hellenic University, Department of Chemistry (Kavala) – Hellenic Fire Academy, School of Fire Officers, Military Nursing Academy (SAN), Hellenic Fire Corps, Greece.</i></p> <p>This paper aims at presenting the existing chemical, biological or radioactive weapon capable of causing widespread death and destruction which name WMDs and at exploring the possibility of the occurrence of incidents involving the use of weapons of mass destruction. In the first part of the paper, we will refer to an overview of the use, during the history, of WMDs and to the definitions of all the types of WMD. In the second part, we will analyze if WMD are a real threat for the future. We examine real incidents and the relations between state and nonstate Actors, Terrorism, and WMD and the development of the new technologies at that field with scope the foreseeing the future of the use of WMD. Finally, we will extract the conclusions. In short, in this paper I argue that although WMD terrorism remains a real prospect, the ease with which such attacks can be carried out has been exaggerated; acquiring WMD capabilities for delivery against targets is a lot more problematic for terrorists than is generally acknowledged in the literature. However, this is not to say that the possibility of such attacks can (or should) be ruled out.</p>
<b>T.6-D.1-O.3</b>	<b>WHAT ROLE FOR THE UNITED NATIONS AND OTHER RELEVANT INTERNATIONAL ORGANIZATIONS IN CASE OF A REQUEST FOR ASSISTANCE PURSUANT TO ARTICLE VII OF THE BWC IN CASE OF USE OF BIOLOGICAL WEAPONS?</b>
09.10 a.m. - 09.35 a.m.	<p>Valeria Santori<sup>1</sup> <i>1. Implementation Support Branch (ISU) for the Biological Weapons Convention (BWC) in the United Nations Office for Disarmament Affairs (UNODA - Geneva Branch)</i></p>



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	<p>While BWC Article VII provides a tool for States Parties to request and receive assistance in case of use of biological weapons against them, the operationalization of this key provision presents a number of major challenges. The Convention provides no procedure for States to request assistance nor for the international community to deliver it.</p> <p>In the context of the Convention’s review process, States Parties have conveyed a clear expectation that the UN “could play a coordinating role in providing and delivering assistance under the Convention” with the help of inter alia the appropriate international organizations, “in accordance with their respective mandates.” However, the means by which this would happen have not been further elaborated. Various initiatives have been supported by States Parties to operationalize Article VII. Canada sponsors a UNODA project, coordinated by the BWC-ISU and implemented in cooperation with relevant international organizations, aimed to enhancing international mechanisms for possible use in the context of a deliberate use and of an Article VII assistance request.</p> <p>The main output of this project is an International Bio-Emergency Management Framework for deliberate events, which aims to harmonize response among international organizations and provide a framework for dialogue and cooperation among them.</p> <p>The need for such a framework has been stressed also by the UN Secretary-General, in his 2018 Agenda for Disarmament and the related implementation plan, which mandates the UNODA, with the BWC-ISU in the lead to “work with all relevant UN entities to contribute to developing a framework that ensures a coordinated international response to the use of biological weapons.”</p>
<p><b>T.6-D.1-O.4</b></p>	<p><b>WEAPONS OF MASS DESTRUCTION AND THEIR PROHIBITION</b></p>
<p>09.35 a.m. - 10.00 a.m.</p>	<p>Claude Lefebvre<sup>1</sup>, Weiszberg Guillaume<sup>1</sup> <i>1. Independent co-authors</i></p>

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	<p>For several years, “disaster films” that deal with weapons of mass destruction (WMD) have regularly fueled the phobia of those who watch them, thinking, wrongly, that these are illusory achievements worthy of the greatest anticipation scenarios. This unpublished work, breaks all taboos by revealing to the readers the veracity of the facts stated and tackles fields as diverse as geopolitics, geostrategy, the most recent technologies, research and the multiple developments related to this subject judged, rightly, particularly sensitive and which over time becomes more and more significant. WMD which appeared during the XX th century, developed particularly during the whole period of the cold war and took off absolutely remarkable in the years 70/80 without really moving public opinion which was far from imagine that they could have caused, if they had been used, the extermination of life on the planet. The book explains in a clear and concise way that these terrifying weapons can, one day or another, be used, and cause the beginnings of an irreversible apocalypse if an awareness of all the leaders of the great powers but also of the populations is not quickly effective.</p> <p>The work, by recalling the main dramatic events linked to use, is intended to raise awareness that the danger is very real. Far from giving miracle “recipes” or lessons to all those who hold absolute power, the book remains completely objective and impartial by listing as exhaustively as possible, all the steps taken to ban the use of radical and definitive of these weapons of terror.</p> <p>Until today, the concept of nuclear deterrence has guaranteed relative world peace among the world's leaders, but in recent years this balance of terror has become more and more unstable, threatened by the emergence of non-existent powers. nuclear weapons that aim to enter by force or threat “into the big leagues”.</p> <p>Regional conflicts highlight the use of insidious, often chemical, weapons which allow certain belligerents to gain the upper hand over their often-destitute enemy to protect themselves from it. This use undermines the various prohibition treaties recalled in this book and demonstrates that moral and human values are no longer accepted and respected references.</p> <p>This highly documented work is therefore a sort of reminder of reality, by showing readers that before there were “settled” conflicts and that from now on it will be necessary to deal with wars without rules.</p> <p>Our contemporary adversary does not have the same value system. Therefore, he will be tempted to fall back into the throes of the most absolute violence by using all the means that can be made available to him to assert his ideology at any cost and especially at the cost of numerous human losses. .in both camps!</p> <p>“Weapons of mass destruction and their prohibition” is therefore aimed at all those who are interested in the subject whether they are specialists or not, the work being intended above all open to everyone not to say being popularized.</p> <p>History buffs, lawyers, professors, students, the military and politicians will find it of interest and can use these few pages to find specific references to perfect their knowledge or even to prepare the drafting. of a dissertation dealing with this complex subject.</p> <p>Sometimes using technical data, this work does not pretend to be scientific but must be able to raise questions or questions that require specific research, sometimes more in depth.</p> <p>If these objectives are achieved for the majority of readers, the authors of this book will have succeeded in their mission which consists above all in raising awareness of the real danger represented by WMD which absolutely must be eradicated from our World in a radical and definitive manner so that no one is tempted to open Pandora's box again without ever being able to close it.</p>
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<b>T.6-D.1-O.5</b>	<b>ISTITUTO AFFARI INTERNAZIONALI: THE ROLE OF A THINK TANK IN THE FIELD OF CBRN</b>
10.00 a.m. - 10.25 a.m.	<p><u>Paola Tessari</u><sup>1</sup></p> <p><i>1. Istituto Affari Internazionali (IAI)</i></p> <p>The aim of this presentation is to introduce Istituto Affari Internazionali (IAI), its profile and especially its expertise and initiatives in the field of CBRN. In line with the topics of the Technical Table 5, the presentation will cover IAI participation in H2020 and other EU Projects, including those which contribute to training and education in CBRN.</p> <p>In particular, the presentation aims to highlight what a think tank can do and what is its specific role in the prevention, preparedness, and protection when it comes to CBRN events. As an example, IAI is part of several networks thanks to the participation in numerous European projects in the CBRN sector.</p> <p>Thanks to this aspect, its strongly contributes to facilitating the exchange of information and meetings between all technological, industrial and institutional stakeholders involved in the relevant research and innovation activities on an ongoing basis. As a think tank, it provides analysis of the possible evolution of the CBRN threat to identify trends and collect and analyse the needs of the actors involved, in order to encourage and propose a response and to channel these needs to the national and European institutions.</p>
<b>T.6-D.1-O.6</b>	<b>BIOLOGICAL TRANSMITTABLE DISEASES IN AVIATION (AIRPLANES AND AIRPORTS). A RISK OR HOAX?</b>
10.25 a.m. - 10.50 a.m.	<p><u>Patrick Wengler</u><sup>1</sup></p> <p><i>1. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></p> <p>Over the years, illnesses and diseases such as smallpox have been eradicated with the help of vaccines. Since the 40's suggestions for getting vaccinated against various diseases and illnesses was given to the citizens in order to prevent their spreading. Over the years, vaccinations evolved e.g. providing additional vaccinations such as the yearly vaccination related to the annual flue proposed on a voluntary basis. Creating the concept of herd immunity. One might think therefore, getting infected with diseases is almost zero to none.</p> <p>Today in a world connected by airplanes covering all the continents, airports and airplanes are presenting a major contamination hub for biological illnesses and eventual diseases. Millions of passengers passing through airports every year. Depending from where they come, not all of them have vaccinations and therefore, illnesses and bacteria are transported from one country, continent to another.</p> <p>It can be argued that the principle of herd immunity is therefore, not applicable in the aviation sector and exposes passengers, aviation operators as well as security personnel to higher risks of transmissible diseases.</p> <p>One might only remember the spreading of the bird flu in 2007-2008, as well as the risks posed by Ebola in 2014 just to name a few.</p> <p>This paper is going to assess the risks of exposure to biological agents in airports and airplanes.</p>
<b>T.6-D.1-O.7</b>	<b>INDUSTRIAL RISK AS BURDEN ON WORKERS POPULATION: INCIDENCE RATES OF NUCLEAR/RADIOLOGICAL OCCUPATIONAL DISEASES ACROSS ITALY IN THE YEARS 2014-2018 USING INAIL AND ISTAT DATABASES</b>
10.50 a.m. - 11.15 a.m.	<p><u>Cicciarella Modica D.</u><sup>1</sup>, <u>Chatzichristou P.</u><sup>1</sup>, <u>Mancinelli S.</u><sup>2</sup>, <u>Mosaico F.</u><sup>1</sup>, <u>Vinci A.</u><sup>1</sup>, <u>Parrinello C.</u><sup>3</sup>, <u>Silvestri G.M.</u><sup>3</sup>, <u>Palombi L.</u><sup>2</sup></p> <p><i>1. School of Specialization in Hygiene and Preventive Medicine, Tor Vergata University of Rome</i></p> <p><i>2. Department of Biomedicine and Prevention, Tor Vergata University of Rome</i></p>

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	<p>To investigate incidence of diseases of nuclear\radiological origin (non-accidental) in Italy among workers in the last 5 years, measuring industrial risk and its association with workers' health.</p> <p>Methods: Data from workforce were collected from Italian National Institute of Statistics (ISTAT). Value of workers population was defined as the average number of workers for years 2015-2018.</p> <p>Data from disease cases were collected from Italian national insurance against injuries on workers (INAIL) Institute. Standardized Incidence Ratios (SIRs), Observed/Expected Ratios (OERs), and their Confidence Intervals (CIs) were calculated and mapped for every province in Italy.</p> <p>Results: 654 cases of nuclear\radiological diseases were recorded. Skin cancer (including melanoma) was by far the most common disease (316 cases, 48,3%) while crystalline lens disease and blood cancer were also common (45 and 28 cases, 6,8% and 4,2% respectively).</p> <p>Some areas (especially the north-eastern coast) show a significantly higher occupational risk; difference in industry type present on the territory may be the cause.</p> <p>Strengths and Limitations: This work combines data from national databases defining nuclear\radiological exposure risk for every administrative unit of Italy and analyzes it in terms of SIR and OER. Unfortunately, time of exposure and non-working related risk factors could not be assessed. Likewise, it has not been possible to have a data linkage with other health data on the same territory, such as genetic and familiar cluster analysis for cancer risk stratification. This design limitation is impossible to overcome due to the way the public databases are structured, since they are created and maintained for administrative purposes and not sanitary ones.</p> <p>Discussion and Conclusions: Cases of radiological work-related illnesses in Italy aren't common, likely due to the protective legislation in the country. Among the diseases found, skin and blood cancers are the ones that mostly reduce life quality and work efficiency in workers.</p>
<p><b>T.6-D.1-O.8</b></p>	<p><b>FAST SURFACE DISINFECTION WITH COUNTERFOG SDR-Fo5A+</b></p>
<p>11.15 a.m. - 11.40 a.m.</p>	<p>Pérez Díaz, José Luis<sup>1</sup>; Sánchez García-Casarrubios, Juan<sup>2</sup>; Méndez-Vigo Carranza, Pablo<sup>3</sup>; Ruiz Navas Elisa María<sup>4</sup>; Iliev Petrov, Mihayl<sup>5</sup>; Martín Pérez, Tania<sup>1</sup>; Alcamí, Antonio<sup>6</sup>; Vázquez, Ángela<sup>6</sup>; Rastrojo, Alberto<sup>6</sup>; Fernández Perea, Gonzalo<sup>7</sup>, Víctor Archilla<sup>8</sup> and María Sánchez-García<sup>8</sup></p> <p>1. Universidad de Alcalá (UAH). 2. Universidad de Alcalá (UAH). 3. SAN JORGE TECNOLÓGICAS S.L. (SJT). 4. COUNTERFOG EBT DE LA UAH S.L. (COUNTERFOG). 5. Universidad Carlos III de Madrid (UC3M) 6. MAG SOAR S.L. (MAGSOAR). 7. Centro de Biología Molecular Severo Ochoa. CSIC. UAM. 8. Instrumentation and experimental measurement techniques laboratory // Energy and Environmental Area INTA (National Institute of Aerospace Technology), Ctra Torrejon Ardoz, Spain</p> <p>COUNTERFOG® is a rapid decontamination and disinfection technology based on the use of dynamic nano-fog cones. When projected onto surfaces they create a nano/micro film of disinfectant minimizing the use of liquids and the impact on environment.</p> <p>The extremely thin film evaporates in a few minutes -depending on the environmental conditions- ensuring the necessary time for the surface to be disinfected. In the present work, surface disinfection tests have been carried out with a series of microorganisms. Operational recommendations are derived to ensure operational disinfection reliability.</p>

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<b>T.6-D.1-O.9</b>	<b>RISKS AND SAFETY MEASURES ASSOCIATED WITH THE STORAGE AND TRANSPORT OF LNG</b>
11.40 a.m. - 12.05 a.m.	<p><u>Luigi Palestini<sup>1</sup>, Fabio Sassu<sup>1</sup></u> <i>1. International Master Courses in Protection Against CBRNe events</i></p> <p>In recent years, from 2000 onwards, there has been an exponential increase in LNG nominal liquefaction and regasification capacity of many countries. The factors underlying this growth are the use of LNG in new combined cycle power plants to produce electricity, a reduction in costs due to technological advances and the current environmental concerns. Furthermore, the technology relating to liquefied natural gas is now mature from the point of view of exploitation as a flexible energy alternative to the construction of methane pipelines, from supplier to buyer countries. In Italy, LNG is mainly transported by road, starting from coastal storage facilities, or from docks, where LNG arrives by train in tank containers (Isotank), which are then transferred by road, for the last part of the journey.</p> <p>But together with the development of these activities there was also a need to assess and counter the related risks. The handling of tanks offers dispersion scenarios connected to collision or impact, or to leaks during liquid LNG transfer operations. Also, these scenarios raise the need to make possible emergency LNG transferring, with the associated risks of domino effects on the remaining tanks because of the possible fire ignition of the leaked liquefied gas. Some fire safety measures have been studied by the CNVVF in recent years, to prevent accidents related to the storage and transport of LNG, or to minimize the consequences. This work offers a brief overview of the risks and safety measures associated with LNG storage and road transport in Italy.</p>
<b>T.6-D.1-O.10</b>	<b>LOOKING AT THE ARMAGEDDON FROM THE KITCHEN WINDOW</b>
12.05 a.m. - 12.30 a.m.	<p><u>Massimo Pedemonte<sup>1</sup></u> <i>1. Italian Police Bomb Squad Commander (Ret.)</i></p> <p>We are here all together, talking about one of the most dangerous threats that will surely modify our common way of life.</p> <p>You may call it terrorism, heard health, or pandemic, as you technicians may judge it and aim as the major one.</p> <p>they were announced challengers, and our commitment now is to defeat them but, naturally, with cooperations and efforts from all fighters in this battle. I will be happy to share and discuss with all of you some field impact of the difference between who, like us, is swimming into the mud and who is looking at you from his desk, forgetting that the evil enemy, mister budget cuts, is sitting at the nearest desk.</p>
<b>T.6-D.1-O.11</b>	<b>BEIRUT PORT EXPLOSION: POST-BLAST MANAGEMENT OPERATIONS</b>
12.30 a.m. - 12.55 a.m.	<p><u>Andrea Gloria<sup>1</sup></u> <i>1. Ten. Col. Italian Army, EU funded project "Technical Assistance on CBRN Risks Mitigation in Lebanon"</i></p>

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*Chairpersons: Dr. Ralf Trapp, Cpt.Hojun Kwon and Prof. Donato Morea  
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	<p>On 4 August 2020, two explosions occurred in the city of Beirut, reportedly caused by 2,750 tonnes of ammonium nitrate being stored in a warehouse in the port of the city. The blasts had resulted in more than 220 deaths and 6,500 injured according to the Government of Lebanon Ministry of Public Health and the United Nations. Significant damage has been reported to buildings and infrastructure particularly in the areas surrounding the port as well as further afield. Up to 300,000 people have lost their houses and are now displaced, with an estimated cost of the damage being above USD 3 billion.</p> <p>The Beirut port explosion accompanied multiple crises, including an ongoing financial crisis increasing the country's poverty rate and the COVID-19 pandemic, both of which have been further exacerbated by the blast putting the entire Lebanese Health System in crisis. Hospitals across the country were overwhelmed and three main hospitals in Beirut were severely damaged. Additionally, it was observed that COVID-19 cases increased exponentially since the explosions.</p> <p>Following the immediate humanitarian support provided by the European Union, United Nations, Foreign Countries, National Agencies and several NGOs, the response efforts shifted towards reconstruction and recovery synergies.</p> <p>Several operations have been conducted to store in a secure manner the chemical substances present in huge quantities, demolish the damaged buildings and remove the ruins in the dense residential and commercial areas within five kilometers of the site of the explosion.</p> <p>International and Lebanese Armed Forces CBRN teams carried out several operations to identify and properly manage the toxic industrial chemicals present in the area and mitigate the effects of their releases.</p> <p>Furthermore, activities have been planned in close coordination with International Stakeholders to manage the waste in a manner that safeguards public health and safety.</p>
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**DAY 2**  
**11 December 2020**

**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events [11 December 2020, 08.20 a.m. - 01.00 p.m. (UTC+1 - Italian Time) , Virtual Room: Leonardo]**

<b>T.1-D.2-O.1</b>	<b>ION MOBILITY SPECTROMETRY IN THE CBRNE AREA</b>
08.20 a.m. - 08.45 a.m.	<p><u>Wolf Münchmeyer<sup>1</sup>, Andreas Walte<sup>1</sup></u>  <sup>1</sup><i>AIRSENSE Analytics GmbH</i></p> <p>AIRSENSE today is leading manufacturer and researcher in the field of ion mobility spectrometry. A short introduction into the past and current projects by AIRSENSE as well as instrumentation in use and introduction is given. A novel set up for the fulfilment of requirements in today's operations in CWA and TICs detection is displayed and explained. Still existing limitations of existing problems in IMS technology are explained and their possible future solutions evaluated in current research are indicated.</p>
<b>T.1-D.2-O.2</b>	<b>DRYVHP: A NEW BIODECONTAMINATION TECHNOLOGY</b>
08.45 a.m. - 09.10 a.m.	<p><u>Fernando Antunes<sup>1</sup></u>  <sup>1</sup><i>Centro de Química Estrutural, Faculdade de Ciências, Universidade de Lisboa, and Delox</i></p> <p>Microbiological contamination and Hospital Acquired Infections (HAIs) represent a major threat to modern Health, causing millions of deaths and accounting for billions of economic losses. The current COVID-19 pandemic is the unfortunate confirmation of the growing threat of untreatable or hard to tackle infections caused by unknown virus and bacteria, endangering lives of health care professionals and patients in hospitals, and ultimately to every human being. dry Vaporized Hydrogen Peroxide (dryVHP), a solid formulation of hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>, oxygenated water), is a new technology developed by the start-up Delox, that enables development of automatic bio-decontamination devices, having a wide range of applications, particularly in healthcare facilities, pharmacies, biodefense, and Space 4.0. Vaporization of Hydrogen Peroxide (VHP) has proven to be a highly efficient (eliminating 99.9999% of microorganisms) bio-decontamination method, currently considered as a state-of-the-art in this field. DryVHP emulates this technology, though it outstrips its complexities, high cost and heavy maintenance. Thanks to dryVHP formulation, the vaporization process is simplified and does not require complex modules. As so, Delox devices can be downscaled to fit virtually any application constraints. This is a critical feature for its use in environments, where portability is needed to transport the bio-decontamination unit from one place to another, or where space is limited and a very compact system is needed. It has no sensitive modules or materials, so the system can operate in harsh environments. In terms of material compatibility, since dryVHP releases a true hydrogen peroxide vapor, it enables its utilization on electronic equipment, as it does not release any droplets. Finally, dryVHP formulation enables safe transportation of concentrated hydrogen peroxide as it is enclosed in a solid form inside a cartridge. In conclusion, dryVHP enables automatic biodecontamination systems that are highly efficient, robust, portable and affordable, democratizing the access to state of the art automatic biodecontamination devices.</p>
<b>T.1-D.2-O.3</b>	<b>MEASURES TO PREVENT TOTAL COLIFORM VIOLATIONS IN THE COMPLIED CHLORINE TREATED WATER AT THE WATER TREATMENT PLANT AND IN WATER DISTRIBUTION SYSTEMS</b>
09.10 a.m. - 09.35 a.m.	<p><u>Ramani Bai V.<sup>1</sup>, Ang C. K.<sup>2</sup>, and Kangadharan G.<sup>3</sup></u>  <sup>1</sup><i>Department of Civil Engineering, UCSI University Kuala Lumpur,</i>  <sup>2</sup><i>Faculty of Engineering, Technology and Built Environment, UCSI University Kuala Lumpur,</i>  <sup>3</sup><i>Alpha Cambridge International School, Tiruchirappali, South India.</i></p>



**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**

Chairpersons: Prof. Pasquale Gaudio, Prof. Prof. José Luis Pérez Díaz and Dr. Frank Duschek  
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	<p>Globally water quality has become a serious issue today, mainly because of the rapid growth of the Nation's development. According to Natural Resources and Environment Ministry Malaysia, the poor water management is the major factor for the water quality issues in Malaysia. Concern over this issue, the Department of the Environment, Ministry of Science, Technology and Environment (DOE) has conducted surveys, data collections and long-term monitoring programmes over river systems in Malaysia. The results of study in Malaysia and similar issue in few other countries have shown that many river systems are polluted by domestic and industrial wastes. Thus, the drinking water treatment process poses the most significant barrier to ensure safe distribution of treated water to consumers and to protect human health from water-related diseases. As a result, almost all over the world including U.S. systems use chlorine-based process to disinfect the water system during the treatment. Studies have shown that the best method of disinfection of treated water is safe and healthy. It has no social implication of any type of epidemic or biologically induced diseases. In 2009, many countries have started suffering due to violation of e-coli and total coliform in their water supplies giving raise to ambiguities in disinfection methods. Therefore, the objectives of this research are: 1) To investigate on the cause of violations 2) To develop a detailed approach to conduct the investigation 3) To identify problematic microbes through sampling at most frequently affected areas 4) The Total Coliform count in the chlorine treated water must meet the requirement of Water Quality Standards or not. The research has come out with the identification of areas to be relooked during water supply distribution and its outlets.</p>												
<p><b>T.1-D.2-O.4</b></p>	<p><b>REAL TIME DETECTION OF CHEMICAL WARFARE AGENTS AT NATO DETECTION LEVELS FOR SURFACE CONTAMINATION</b></p>												
<p>09.35 a.m. - 10.00 a.m.</p>	<p><u>Dieter Rothbacher<sup>1</sup>, Philipp Sulzer<sup>2</sup>, Rene Gutmann<sup>2</sup></u>  <sup>1</sup>. CBRN Protection GmbH, Brigittagasse 14/25-26, 1200 Vienna Austria  <sup>2</sup>. IONICON Analytik GmbH, Eduard-Bodem-Gasse 3, 6020 Innsbruck, Austria</p> <p>NATO doctrine considers clearance decontamination to be applicable after the termination of an incident. Clearance decontamination procedures are such that the process is verified as being achieved by determining the residual contamination levels on every part of various surfaces of equipment and infrastructure and demonstrating that those levels are below those predetermined by the appropriate authorities responsible for the safety of incident response organizations and the civilian population. The essential NATO detection levels for surface contamination for some Chemical Warfare Agents are:</p> <table border="0"> <tr> <td>Agent</td> <td>Essential µg/cm<sup>2</sup></td> </tr> <tr> <td>GA/GB</td> <td>5.28</td> </tr> <tr> <td>GD</td> <td>1.11</td> </tr> <tr> <td>GF</td> <td>1.06</td> </tr> <tr> <td>VX</td> <td>0.03</td> </tr> <tr> <td>HD</td> <td>1.5</td> </tr> </table> <p>According to NATO it is clear that some of these levels are particularly challenging and may be beyond current detection technologies. But they can be detected, in real time, with existing technologies. PTR-MS (Proton Transfer Reaction – Mass Spectrometry) enables simultaneous real-time detection, monitoring and quantification of volatile organic compounds (VOCs). Live agent trials and evaluations with this PTR-MS technology, using Chemical Warfare Agents as contaminants, have shown that this technology can detect surface contamination densities at the required NATO levels. The presentation at the SICC CBRNe Conference 2020 will demonstrate that PTR-MS technology could be an invaluable asset in support of response organisations and civilian</p>	Agent	Essential µg/cm <sup>2</sup>	GA/GB	5.28	GD	1.11	GF	1.06	VX	0.03	HD	1.5
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**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**

Chairpersons: Prof. Pasquale Gaudio, Prof. Prof. José Luis Pérez Díaz and Dr. Frank Duschek

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	authorities when determining safe levels of surface contamination in real time, after the completion of decontamination operations.
<b>T.1-D.2-O.5</b>	<b>DEVICES IN COMBINATION WITH CBRN PAYLOADS AND RELATED RSPs</b>
10.00 a.m. - 10.25 a.m.	<p><u>Marco Appodia</u><sup>1</sup></p> <p><i>1. European Centre for Manual Neutralisation Capabilities (ECMAN)</i></p> <p>Background: Intelligence-based threat assessments at national and international levels indicate an increased likelihood of terrorist organisations, including state sponsored terrorism, and insurgencies using Improvised Explosive Devices (IED) or Improvised Dispersal Devices (IDD) associated with CBRN payloads against both military and civil targets.</p> <p>CBRN EOD is the use of EOD procedures on devices that contain chemical, biological, radiological or nuclear payloads and materials. There are situations where the operational environment makes the risk of exploding an IED or dispersing a payload unacceptable. In these situations, the use of IEDD and CBRN EOD procedures and energetic weapons may be inappropriate and Manual Neutralisation Techniques (MNT) may be required. As a rule, the render safe procedures of those devices are of a complex nature and require very high levels of coordination by all parties involved, including special assignment and safety regulations, additional education, training and equipment. MNT is a specialist EOD operator qualification, a niche EOD skill-set to address discrete threats (including improvised devices in combination with CBRN payloads), support operations with specialist force elements or to maximise weapons technical exploitation. The European Centre for Manual Neutralisation (ECMAN): ECMAN is a multinational sponsored manned entity, which offers recognised expertise and experience to the contributing Member States regarding current tendencies, emerging threats and future trends, and the improvement of techniques, tactics (TTPs) and procedures in the field of MNT (including CBRN MNT). ECMAN, under the umbrella of the European Defence Agency (EDA), is a perfect example for Pooling &amp; Sharing in the European context. ECMAN provides opportunities to enhance education and training (including CBRN MNT Course), to improve interoperability and capabilities, to assist in doctrine, TTPs and equipment development and ensures also testing and validation of concepts through experimentation. Technical feedback: The neutralisation of devices in combination with CBRN payloads requires compliance with special procedural and safety regulations, a proper Threat Assessment, the use of specific Personal Protective Equipment (PPE) during the execution of the Render Safe Procedures (RSPs) and necessitating coordination with other specialized forces like CBRN defence assets and other elements/actors in specific fields of knowledge. The execution of CBRN MNT is the only solution when the explosion or the dispersal of CBRN devices is unacceptable and the use of regular IEDD or CBRN EOD procedures and energetic weapons is not appropriate. Relations to other areas: CBRN defence, WMD disablement, and Intelligence. Cooperation/interaction with other multinational entities. In 2018 and 2019, Instructors from ECMAN were called to participate and support specific events in the fields of CBRN defence and CBRN EOD.</p> <p>In those specific fields of knowledge, ECMAN has a strong cooperation with the Joint CBRN Defence Centre of Excellence in Vyskov (CZ), the EOD Centre of Excellence in Trencin (SK), the Seibersdorf Laboratories in Austria and the University of Tor Vergata in the context of the "International CBRNe Master Courses"</p>

**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**

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<b>T.1-D.2-O.6</b>	<b>THE CERTAINTY OF EFFECTIVE DECONTAMINATION</b>
10.25 a.m. - 10.50 a.m.	<p data-bbox="358 229 860 256"><b>Antonio Nuñez Ortuño<sup>1</sup>, Luis Rodríguez Álvarez de Lara<sup>1</sup></b></p> <p data-bbox="358 262 729 285"><i>1. Military Emergency Unit. Ministry of Defence. Spain</i></p> <hr/> <p data-bbox="358 293 1151 633">One of the activities that CBRN identification laboratories, such as the LABIR of the Military Emergency Unit (UME), can perform in a biological incident is validation of the effectiveness of materials, decontaminating solutions and procedures. Hydrogen peroxide applied by misting and electrostatic spraying has been the most commonly used method by the UME for the disinfection of stays with positive cases of COVID-19, during the pandemic. Monitoring decontamination (disinfections and sterilizations) with hydrogen peroxide in real time for verification and validation processes requires the pre-establishing a rigorous design of the validation process. This process requires the definition of parameters such as: application times, environmental conditions, minimum concentrations, and allows us to obtain documented evidence with a high degree of guarantee of disinfection efficiency, raising reliability standards in TIC decontamination process's and NRBO agents based on hydrogen peroxide</p>
<b>T.1-D.2-O.7</b>	<p data-bbox="358 675 1151 751"><b>PROTECTION OF CIVIL SOCIETY IN A VUCA WORLD. CASE STUDY: LIBRARY FREE BULK DETECTION OF EXPLOSIVES - COMBINING SIMPLE SENSORS FOR RESOLVING A COMPLICATED ISSUE</b></p> <p data-bbox="358 757 1151 806"><b>Kostyantyn Konstantynovskiy<sup>1</sup>, Christof Hammer<sup>1</sup>, Gerald Njio<sup>2</sup>, Niklas Wenzel<sup>2</sup>, Gerhard Holl<sup>1,2</sup>, Thomas M. Klapotke<sup>3</sup></b></p> <p data-bbox="358 811 1151 848"><i>1. German Aerospace Center (DLR), Institute for the Protection of Terrestrial Infrastructures (PI), Rathausallee 12, 53757 Sankt Augustin, Germany</i></p> <p data-bbox="358 853 1151 891"><i>2. University of Applied Sciences Bonn-Rhein-Sieg (BRSU), Institute for Detection Technologies (IDT), von-Liebig Str. 20, 53359 Rheinbach, Germany</i></p> <p data-bbox="358 897 1151 933"><i>3. Ludwig-Maximilian's University Munich (LMU), Department of Chemistry, Butenandtstrasse 5-13, Haus D, 81377 Munich, Germany</i></p>
<b>T.1-D.2-O.8</b>	<p data-bbox="358 975 834 1002"><b>HI 90: TECHNOLOGIES TO SUPPORT THE RESCUE</b></p> <p data-bbox="358 1008 486 1035"><b>Luigi Palestini</b></p> <p data-bbox="358 1041 812 1064"><i>International Master Courses in Protection Against CBRNe events</i></p> <hr/> <p data-bbox="358 1071 1151 1252">The Bruker Hyperspectral Imaging System HI 90 is an imaging remote sensing system based on the combination of a Michelson interferometer and a focal plane array detector. The system is based on state-of-the-art technology and its main feature is fastest and utmost reliable identification of hazardous gas compounds from remote locations. The HI 90 allows identification, quantification and visualization of potentially hazardous gases from long distances. The image provided by the instrument allows an assessment of the dimensions and the dispersion of a cloud.</p> <p data-bbox="358 1257 1151 1512">This sophisticated equipment will allow the Italian Fire Brigade to improve chemical protection on the national territory. Recently these devices have been assigned to three firefighters' facilities. The HI 90 is the evolution of the SIGIS, an old generation equipment, which can be technologically considered the ancestor of the HI 90. In this work a Hyperspectral Imaging System HI 90 lwas deployed to measure gas emissions in the Italian firefighters training facility of Capannelle in Rome. Emissions from industrial sources as well as gases released intentionally were measured. The instrument tested has given good results. The gas clouds were identified, visualized, and tracked in real time. The system proved to be robust in the field and characterized by high signal to noise ratio and low detection limits.</p> <p data-bbox="358 1517 1151 1641">With the acquisition of the new HI 90, Italian Firefighters will have the possibility to extend the NBCR umbrella (Nuclear Biological Chemical Radiological), increasing and improving the possibilities of intervention, as well as reducing at the same time the response capacity in case of threat chemical or industrial accident, in any scenario that could endanger public health or environmental safety.</p>

**TECHNICAL TABLE 1. Biological, Chemical and explosive (BCe) Events**

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<b>T.1-D.2-O.9</b>	<b>UV REMOTE RAMAN DETECTION OF CHLORINE</b>
11.40 a.m. - 12.05 a.m.	<u>Emanuela Gallo</u> <sup>1</sup> , Frank Duschek <sup>1</sup> <i>1. German Aerospace Center, Institute of Technical Physics, 74239 Hardthausen, Germany</i>
	Ultraviolet Raman spectroscopy measurements have been performed at the German Aerospace Center (DLR) to detect chlorine gas. In this study a remote Raman set up was optimized to detect chlorine gas at a safe distance (60 cm) from an unwanted source of danger. Several ultraviolet laser wavelengths (224, 232, 235 nm respectively, 2.5 mJ/pulse at 10 Hz) were changed to experimentally observe the highest possible signal to noise ratio. For each tested wavelength, chlorine spectra were successfully detected. Detection limits in acquisition time are presented. Different sample cell materials, different sample concentration, and additional laser excitation wavelengths (up to 355 nm) tests are in progress.
<b>T.1-D.2-O.10</b>	<b>CYANIDE REMEDIATION BY ADSORPTION AND BIOSORPTION PROCESS</b>
12.05 a.m. - 12.30 a.m.	<u>Jahnvi M.</u> <sup>1</sup> , <u>Madhumala. Y.</u> <sup>2</sup> <i>1. Civil Engineering Department, Basaveshwar Engineering College –Bagalkot</i> <i>2. Department of Biotechnology, Basaveshwar Engineering College –Bagalkot</i>
	In the present study, comparative investigation for removal of cyanide from synthetic aqua solution by using locally prepared Almond coil powder and isolated Testing Factor 1 (TF1) strain have been performed as a function of solution pH, contact time, initial concentration of cyanide and sorbent/ biosorbent dosage perform the experiments, Response Surface Model (RSM) is used in order to develop the experimental design, and also for the analysis of fitness of Quadratic model along with optimal conditions. The cyanide effect by Almond coil powder and TF1 strain has been quantitatively analyzed using isotherms model. Both adsorption and biosorption data are best fitted to Langmuir isotherm model for cyanide remediation as calculated by Langmuir isotherm are 558.126 mg g <sup>-1</sup> and 50.458 mg g <sup>-1</sup> respectively. The present study shows that the locally prepared almond coil powder and locally isolated TF1 strain can be used for the cyanide removal. The study results also show that, the cyanide removal efficiency of the biosorbent is high as compared to the locally prepared almond coil under the optimal condition of variable factors.

**TECHNICAL TABLE 2. Epidemics, Medical Management and First Aid, Psychology**

Chairpersons: Prof. Leonardo Palombi, Prof. Amer Hosin and Prof. Vasilis Vasiliou

DAY 2 - 11 December 2020

**TECHNICAL TABLE 2. Epidemics, Medical Management and First Aid, Psychology [11 December 2020, 02.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time), Virtual Room: Leonardo]**

<p><b>T.2-D.2-O.1</b></p>	<p><b>BUILDING MENTAL HEALTH RESILIENCY AMONG THE PUBLIC AND EMERGENCY STAFF IN THE WAKE OF COVID-19 PANDEMIC</b></p>
<p>02.00 p.m - 02.25 p.m.</p>	<p><u>Amer Hosin<sup>1</sup></u>  <i>Visiting Professor, School of Psychology, University of Ulster, Coleraine, Northern Ireland BT52 1SA, UK</i></p> <p>This presentation will focus on the relevant important of building mental health resiliency among the public and frontline emergency staff in the wake of unprecedented national risks and crisis. The presentation will highlight reactions of the public and those of all frontline emergency staff who are confronted with unusual calls and demands on their services. In particular on hospitals' services which –at the present- have limited resources capacity globally. Due to the pandemic, the global shut down, current crisis and the damaged imposed by the Covid-19 on the public in term of their livelihood and wellbeing, it becomes paramount important to promote mental wellbeing among the public and all emergency staff. That is among frontline emergency staff including nurses, doctors, emergency family physicians, surgeons, junior doctors, hospital staff, CBRN staff and other first responders who are responding to emergency calls. Most emergency staff often (during this crisis) deals with perhaps infected individuals, hospitalized persons and /or mass hospital fatality. Many of these first responders have to stay away from their families and love ones for a durations; and face the challenge of seeing death and dying during their duty. And indeed very often such staff may communicate the sad news to families of the deceased person and perhaps sign the deceased death certificates. As a result emergency staff meet the challenges, accumulate stress and some become traumatized; and indeed do require help and support. Those without such support shall fall ill and could be on sick leave, removed for duration from the service. The public on other hand including families and employers should become aware of the impacts of stress of the current pandemic that might leave on emergency staff during this prolonged crisis. Aspects of public reactions, triage and management of stress will be discussed in the presentation.</p>
<p><b>T.2-D.2-O.2</b></p>	<p><b>BEING A GYNECOLOGIST DOCTOR SPECIALIZED IN IVF, A MOTHER AND A WOMAN AT THE TIME OF COVID-19</b></p>
<p>02.25 p.m - 02.50 p.m.</p>	<p><u>Ferrero Susanna<sup>1</sup></u>  <i>1.Studio Medico Dr.ssa Susanna Ferrero</i></p> <p>The COVID-19 pandemic is affecting people worldwide with terrible impacts (health, economy, social, phycological), but I would like to focus the attention on what is worsening the female world. Although has been demonstrated that the male gender has a highest risk factor due to the presence of testosterone, women are severely affected term of:</p> <p>Health Impact:</p> <ul style="list-style-type: none"> <li>• Reduction of life expectancy in terms of delay on necessary oncological checks and consequent progression of related pathologies;</li> <li>• Delay/Stop in taking up the battle against the infertility which can result in potential depression;</li> <li>• A significant increase in fears for both, the woman herself and the incoming creature.</li> </ul> <p>Social Impact:</p> <p>The ability to resilience and manages critical situations has always been a female peculiarity but we cannot fail to consider objective data such as:</p> <ul style="list-style-type: none"> <li>• Reduced chances to save the job position after severe economic crisis;</li> <li>• Enormous stress for the dual role of mother and worker aggravated by the distance learning (DAD)</li> </ul>

**TECHNICAL TABLE 2. Epidemics, Medical Management and First Aid, Psychology**

Chairpersons: Prof. Leonardo Palombi, Prof. Amer Hosin and Prof. Vasilis Vasiliou

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	In this work I will bring to the attention on my experience in this emergency period as gynecologist doctor specialized in In Vitro Fertilization (IVF); as mother and as woman living this situation in the Italian Society.
<b>T.2-D.2-O.3</b>	<b>OCCUPATIONAL STRESS AND MENTAL HEALTH WELLBEING OF STAFF WORKING IN HOSPITALS AND MEDICAL /HEALTH SETTINGS DURING THE COVID-19 PANDEMIC</b>
02.50 p.m - 03.15 p.m.	<p><u>Rifaat Al Hussein</u><sup>1</sup></p> <p><i>1. School of Psychology, Faculty of Life and Health Sciences, University of Ulster Coleraine Campus, Northern Ireland BT52 1SA, UK</i></p> <p>The proposed study focuses on stress among frontline staff during covid-19 pandemic. The planned research is aimed to reflect and in particular on the unique experience of hospitals' staff and allied colleagues who worked during the covid-19 pandemic in major demanding health settings. Apart of few media reports, published research work in this area are very limited. With regard to design and measures used, this planned research will be using a mix-design approach. At first this study shall address stress level among staff via the survey questionnaires; and then at the second stage -through focus and structured interviews- the narratives, the detailed memories and the stories of hospital staff during the pandemic will be assessed. The second stage is expected to reflect on the staff emotion, grief, and fear of infection, anxiety and thoughts. And memories of losing patients, fear of being infected and infecting love one, memories of work load and case load, patients in the emergency and ICU (intensive care unit) fear of dying, the large admissions rate, the seriousness of the illness, lack of resources at time, seeing patients fighting for surviving, then possible fatigue due to caseloads, coping and the challenges of coping. Additionally, this research will reflect on coping and what make these staff walk tall and steadfast in emergency rooms. Was it their dedication to the jobs, or their values, culture, religion or altruism? these issues will be addressed in details. Further, this study will examine measures of support and/or policies formulated by those chosen participating hospitals to support staff to combat stress during the pandemic. As some described hospitals' environments during pandemic as a war zone and full of causalities, ie seeing big demands, full ICU with many patients were sent home due to lack of capacities. As indicated, the proposed research will be devoted to level of stress among health care provider staff, coping strategies used, lesson learnt and perhaps the similarities and differences between different hospitals participated in this study. What make this study unique are those experiences and narratives of the participating hospital staff in this study. That is an experience which should not go unrecorded and/or un-investigated by psychologists and other allied professionals specialized in secondary traumatization.</p>
<b>T.2-D.2-O.4</b>	<b>THE IMPACTS OF COVID-19 ON THE DELIVERY OF EDUCATION</b>
03.15 p.m - 03.40 p.m.	<p><u>Amal AlKooos</u><sup>1</sup></p> <p><i>1. Former under Secretary for Education, UAE</i></p>

**TECHNICAL TABLE 2. Epidemics, Medical Management and First Aid, Psychology**

Chairpersons: Prof. Leonardo Palombi, Prof. Amer Hosin and Prof. Vasilis Vasiliou

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	<p>COVID-19 pandemic impacts have been extreme and globally wide ranges. The effects of Covid-19 covered high infection and mortality rates, restrictions and lockdown, poor physical and mental health, lifestyle changes as well as shrinking economy, day to day business discontinuity and poor production. Also the impacts of delivery of education and learning –the main focus of this presentation- and on other conventional work place were visible. Further, the demands on health services and stretched hospitals worldwide at the beginning of the pandemic and still now are unparalleled and absolutely extreme too. Focusing on remote, distance and e-learning, the pandemic has now imposed on us the virtual reality development which requires familiarization with digital and virtual learning. The world is also gradually shifting its focus and priorities toward investment in health and wellbeing economy, work life balance, life satisfaction and indeed enhancement of public wellbeing through well considered public spending. Education has been already shifted to online mode. Indeed, many universities and other governments’ agencies follow this path. Hence imposing new reality on preparation, training and development on all stakeholder who work from distance. These new reality requires supporting environment, supporting curriculum and technology readiness. However, a decision on virtual education and remote learning can be taken on national level in each country should the required virtual environment and relevant curriculum and technology provided. Other impacts of Covid-19 on education will be highlighted and discussed in the presentation.</p>
<p><b>T.2-D.2-O.5</b></p>	<p><b>DEFINE, DEVELOP AND DEPLOY A HARMONISED CBRN TRAINING CURRICULUM FOR FIRST RESPONDERS AND MEDICAL STAFF - FIRST RESULTS FROM THE EU MELODY PROJECT</b></p>
<p>03.40 p.m - 04.05 p.m.</p>	<p>Carlos Rojas-Palma<sup>1</sup>, Ahmed Nagy<sup>1</sup>, Marike van der Horst<sup>2</sup>, Saskia Rutjes<sup>3</sup>, Mariachiara Carestia<sup>4</sup>, and Svenja Stovens<sup>5</sup></p> <p>1. SCK CEN, Belgian Nuclear Research Centre: Mol, Antwerp, BE  2. TNO DEFENCE SAFETY &amp; SECURITY, Rijswijk, NL  3. Centre for Infectious Disease Control, National Institute for Public Health and the Environment (RIVM), Bilthoven, NL  4. University of Rome Tor Vergata, Rome, IT  5. European CBRNE Center, Umeå University, Umeå, SE</p> <p>Under the European Commission’s Internal Security Fund – Police program the MELODY Project (GA 814803) is to develop a harmonized CBRN training curriculum for first responders and medical staff. The development covers consultation with end-users on requirements and needs, stocktaking, agreement on contents and structure and subsequent assessment and evaluation through table-top and field exercises. During the early stage of MELODY, six target groups for the curriculum have been identified base on operational needs: Dispatch Officers, Fire Brigade, Law Enforcement Agencies, Ambulance Services, Emergency Medical Services, General Practitioners. Since harmonization can be reached through consultation with experts and reaching consensus, in addition to the conventional project internal quality control, MELODY engaged with volunteers from these six target groups in order to evaluate and validate the curriculum and its training material. Evaluation activities are taking place in different countries (Belgium, Hungary, Sweden and Finland).  The curriculum is fostering interagency cooperation, recognized as paramount to promote a smooth response to CBRN events.  In order to overcome the main obstacles to the provision of CBRN training among these categories the training curriculum has been designed with a modular approach, that allow adjustment to specific training needs and conditions such as available time or focus on specific subjects.  This paper is intended to elaborate on MELODY’s current status as well as on the work still laying ahead.</p>

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<p><b>T.2-D.2-O.6</b></p>	<p><b>THE COORDINATION OF A DIAGNOSTIC DEPARTMENT DURING THE SARS-COV-2 PANDEMIC: HOW TO GUARANTEE THE BEST SERVICE DURING THE EMERGENCY AND THE SAFETY OF PATIENTS AND WORKERS</b></p>
<p>04.05 p.m - 04.30 p.m.</p>	<p><u>Manenti Guglielmo<sup>3</sup></u> and <u>Malizia Andrea<sup>1</sup></u>  <i>1. Department of Biomedicine and Prevention, University of Rome Tor Vergata</i></p> <p>The regular activities related to an hospital department devoted to diagnostic is usually full of visits, relation with the patients, regulation of the works shift, training of the students and doctors under the specialization problems as well as a continuous adequation of the machines, technologies, regulations and a constant update. The academicians have also to keep going with the didactic, research and scientific publication. Nowadays, to all this huge amount of activities, the risks related to the SARS-COV-2 PANDEMIC. The authors in this paper will explain how the regulations (in a daily evolution) have been implemented in order to guarantee the best service during this emergency as well as to maintain the highest level of quality and safety for the patients and the operators.</p>
<p><b>T.2-D.2-O.7</b></p>	<p><b>XYLELLA FASTIDIOSA ASSOCIATED TO THE OLIVE QUICK DECLINE SYNDROME (OQDS) IN SOUTHERN ITALY: NATURAL OUTBREAK OR AGROTERRORISM?</b></p>
<p>04.30 p.m - 04.55 p.m.</p>	<p><u>Arduini D.<sup>1</sup></u>, <u>Ludovici G.M.<sup>1</sup></u>  <i>1. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></p> <p>In autumn 2013, the presence of <i>Xylella fastidiosa</i>, a Gram-negative bacterium limited to the xylem, was detected in the olive groves of a large area of the Salento peninsula (Apulia, Southern Italy), seriously affected by the disease called Olive Quick Decline Syndrome (OQDS). Numerous studies have been conducted in order to determine the degree of involvement of this bacterium in the genesis of OQDS and in the burning of the leaves shown in numerous types of infected plants, different from the olive tree, present in the same area. Diffusion rate and the amount of affected olive groves, with the consequent economic damage, have raised some suspicions regarding on truthfulness of bacterium natural outbreak. Currently, there is a reversal of the trend of terrorist groups compared to the past: from the attack on people to the destruction of property and commerce. Bioterrorists can choose agriculture as a means of an asymmetrical war in order to paralyze the entire socio-economic sector of a rival nation. Furthermore, if a disease is slow to show signs of its destructiveness, measures to counter it will also be delayed. The introduction of these organisms is easy and while the eradication costs are extremely high, the chances of successfully leading a pathogen eradication are low. Biological weapons (BWs) capable of afflicting agriculture can be used for the purpose of manipulating future markets with the advantage of not causing an emotional peak or moral barriers as no one is killed. In fact, agroterrorism is today defined as the intentional modification of a natural ecological system in order to cause physical, economic and psycho-social destruction in relation to a specific geophysical objective or a particular population. Technically, agroterrorism combines internal destabilization with the destruction of sources of supply and the psychological effect of the "scorched earth", rapidly inducing enemy populations to the point of exhaustion. In conclusion, agricultural pandemics can lead to economic production losses of immense proportions and for long enough times to determine important crises especially if perennials, such as olive trees, are affected; the strange spread of <i>Xylella f.</i> in Southern Italy it can therefore lead to suspicion of a hypothetical act of agroterrorism.</p>
<p><b>T.2-D.2-O.8</b></p>	<p><b>CHEMICAL RISK AS BURDEN ON WORKERS POPULATION: INCIDENCE RATES OF CHEMICAL-RELATED OCCUPATIONAL DISEASES ACROSS ITALY IN THE YEARS 2014-2018 USING INAIL AND ISTAT DATABASES</b></p>
<p>04.55 p.m - 05.20 p.m.</p>	<p><u>Giulia Agosti<sup>1</sup></u>, <u>D'Amico Margherita<sup>1</sup></u>, <u>Biondi Giorgia<sup>1</sup></u>, <u>Cecchetti Lorenzo<sup>1</sup></u>, <u>Finamore Nikolaos<sup>1</sup></u>, <u>Traglia Francesco<sup>1</sup></u>, <u>Morciano Laura<sup>2</sup></u></p>



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	<p>1. Specialization School of Hygiene and Preventive Medicine, University of Rome Tor Vergata , Rome , Lazio, Italy 2. Biomedicine and Prevention, University of Rome Tor Vergata, Roma, Lazio, Italy</p> <p>Objectives: Aim of this work is to investigate incidence of diseases of chemical origin (non-accidental) in Italy among workers in the last 5 years. Methods: Data about workforce population were collected from Italian National Institute of Statistics (ISTAT). Value of workers population was defined as the average workers number for years 2014-2018. Data about disease cases were collected from Italian National Insurance Against Injuries on Workers Institute (INAIL). Standardized Incidence Ratios (SIRs), Observed/Expected Ratios (OERs), and their Confidence Intervals (CIs) were calculated and mapped for every province in Italy. Results: 3411 cases of chemical-related diseases are recorded. Most common diseases were: dermatitis and erythema (1019 cases, 29.9%), lung diseases caused by external agents (547, 16.0%), chronic respiratory diseases (537, 15.7%), intra-thoracic neoplasms (490, 14.4%) and urinary tract malignancies (384, 11.3%). Significantly higher differences in occupational risk emerged among the different provinces of Italy. Strengths and Limitations: To the authors' knowledge, this is the first work using data from national databases about chemical exposure risk for every Italian administrative unit and analyzing them in terms of SIR and OER. Unfortunately, administrative databases do not allow to retrieve information about time of exposure and potential previous exposures, neither do they allow to analyze non-work-related risk factors or to retrieve health data. This design limitation is due to the public databases structures, since they are created and maintained for administrative purposes and not sanitary ones. Discussion and Conclusions: Chemical working exposure is related mainly to neoplasms and dermatologic diseases. Public health authorities of areas at higher risk should tailor their screening and diagnostic programs aimed on workforce population considering such information, and should always promote use of Personal Protective Equipment (PPE) among workers. Geomapping is also an effective tool for public health professionals to evaluate prevention and surveillance programs, based on territory necessities.</p>
<b>T.2-D.2-O.9</b>	<b>ENVIRONMENT EFFECTS ON AEROSOL DYNAMICS. SIMPLE RULES TO PREVENT AEROSOL TRANSMISSION</b>
05.20 p.m - 05.45 p.m.	<p><b>Juan Sánchez García Casarrubios<sup>1</sup>, José Luis Pérez Díaz<sup>1</sup></b></p> <p>1. Escuela Politécnica Superior. Universidad de Alcalá. Madrid. España</p> <p>Evidences of SARS-CoV-2 transmission through aerosols are increasingly stronger. Aerosols, being invisible to the human eye, behave in a non-intuitive manner. The knowledge of their dynamics in a close room is of a main importance to understand and prevent transmission of COVID19. Patients that breath or cough, could exhale a broad distribution of bio-aerosol droplets between 0.3 and 5 µm charged with SARS-CoV-2. These virally charged droplets remain on air and are able to penetrate deep into the lungs and be deposited on alveoli. Air temperature and humidity condition the dynamics of aerosols and air-borne matter. The objective of this work is to analyse experimental data of aerosol dynamics in confined areas and provide simple rules to prevent aerosol transmission in closed environments.</p>
<b>T.2-D.2-O.10</b>	<b>ROMAN HOSPITAL MANAGEMENT OF A POTENTIAL CBRNE EVENTS</b>
05.45 p.m - 06.10 p.m.	<p><b>Rosiello Francesco<sup>1</sup>, Vinci Antonio<sup>2</sup>, Ricci Livia.<sup>3</sup>, Morida Khalil Ramla.<sup>3</sup>, Monti Manuel<sup>4</sup>, Zelinotti Luca<sup>5</sup>, D'Oca Elisa<sup>6</sup>, Ricci Serafino<sup>7</sup></b></p> <p>1. Ph D Student in Microbiology, Infectious Disease and Public Health, Sapienza-Università di Roma 2. Department of Biomedicine and Prevention, University of Rome Tor Vergata 3. Medical Doctor 4. PS Assisi</p>

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	<p>5. Emergency management 6. CDC Sant'Anna-Policlinico città di Pomezia 7. Legal Medicine, Sapienza-Università di Roma</p> <p>Background: Rome hosts 6 advanced Emergency Departments (EDs) and 7 basic ones are the first line of defense of the city, and should provide healthcare assistance in case of maxi-emergencies. Rome hosts 5 warehouses of National Stockpile Antidotes (SNA), in case of a CBRN event, stockpiles are activated with a long-time call to be charged and delivered through specific trucks. Methods: The present study analyzes the PEIMAFs (State of emergency plans for massive influx of injures) of advanced EDs in Rome and their adequacy in case of a CBRNe attack. We hypothesized a chemical attack at Saint Peter's Square during the General Assembly, on Wednesday (at 12.00). Subsequently, with a table-top simulation we evaluated the efficacy and the effectiveness of the SNA, and the travel times between the SNA warehouse and EDs. Findings: Being EDs chronically undermanned during the ordinary working conditions there will be serious issues in suddenly hosting a very large number of critical patients. In addition not all the hospitals inform their workers about PEIMAF or consider CBRNe emergencies in their PEIMAF, and simulations are not always performed. Moreover, the communication between the different institution involved is not optimal, presenting a major risk of contamination in case of CBRNe attacks. Conclusions: Our data highlight that despite an overall good organization there is room of improvement in shorting the times of travelling. In addition we believe is mandatory to develop in all the major roman hospitals the PEIMAF, which should be followed strictly by an organized training plan involving both theoretical teaching, indoor and outdoor simulation, in order to train the hospital personnel and to evaluate weaknesses and vulnerabilities of the single PEIMAFs. Concluding, a smart call system can reduce the activation time of SNA, as well as well a better organization between the major hospitals in Rome, which can help reducing delivering time.</p>
<b>T.2-D.2-O.11</b>	<b>SHAPE-BASED INTELLIGENT MANAGEMENT OF MEDICAL WASTE USING ARTIFICIAL NEURAL NETWORKS</b>
06.10 p.m - 06.35 p.m.	<p>Ramani Bai V.<sup>1</sup>, Abdul Mazli Hafiz A. M.<sup>2</sup>, Ruzaimah R.<sup>3</sup>, Kangadharan G.<sup>4</sup></p> <p>1. Civil Engineering UC SI University, Malaysia 2. Department of Environment, Malaysia 3. Civil Engineering UC SI University, Malaysia 4. Alpha Cambridge International School, Trichirappalli</p>
	<p>This paper describes an intelligent rigid object classification technique which is applied to medical waste materials. Fourier descriptors calculated from the centroidal profiles of the objects are used as identifying features. A collection of training images was made including objects belonging to various classes. After a series of image processing operations, the boundaries of the objects are extracted. The Fourier descriptors of their centroidal profiles are calculated and used as features to train Artificial Neural Networks (ANN). The trained network is capable of classifying an input shape into its proper class. This network is then used in a real-time system with a camera, and can classify known objects in the camera's output image. The developed ANN model has proved to be 100% successful in classification of most of the types of medical wastes from hospitals and medical outlets.</p>

**TECHNICAL TABLE 3. Cybersecurity, Critical Infrastructure, IoT and AI Investigation**

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**TECHNICAL TABLE 3. Cybersecurity, Critical Infrastructure, IoT and AI Investigation [11 December 2020, 02.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time), Virtual Room: Galileo]**

<b>T.3-D.2-O.1</b>	<b>INTEGRATED INFORMATION MODEL OF ENTERPRISE AND CYBERSECURITY MANAGEMENT SYSTEM: FROM DATA TO ACTIVITY</b>
02.00 p.m - 02.25 p.m.	<p><u>Vyacheslav Kharchenko</u><sup>1</sup>, <u>Sergiy Dotsenko</u><sup>2</sup>, <u>Oleg Illiashenko</u><sup>1</sup></p> <p><i>1.National Aerospace University "Kharkiv Aviation Institute" (KhAI), Department of Computer Systems, Networks and Cybersecurity (Ukraine)</i></p> <p><i>2.Ukrainian State University of Railway Transport, Department of Specialized Computer Systems (Ukraine)</i></p> <p>The rapid development of information technology in the first two decades of the 21st century has led to a number of new tasks including security and safety assessment, ensuring and management. These tasks are solved for each subject area independently. In addition, the concept of knowledge security or knowledge (knowledge-oriented) security has already emerged. Since the basic concepts in information technology are the concepts of "data", "information" and "knowledge", it is possible to assume that the very establishment of the form of relations between these concepts will ultimately ensure the establishment of the form of relations for various forms of (data, information and knowledge) security. The paper analyzes the concepts of "data", "information", "knowledge", "intelligence", "activity" establishes their relationship in the context of integrating information about the organization with the contours of security management through the connection of information technologies, operation technologies, ecology technologies (IT, OT, ET). The interconnected models of thinking are considered as an integrated model of information representation of the organization, the presence of which provides a transition to the problem of integrated management of all identified components of information representation of the organization. The paper proposes an integrated model of information representation of the organization with the contours of data management, information, knowledge and activity / intelligence. The peculiarity of this model is that it explicitly includes activities that are implemented on the basis of the laws of natural intelligence and formed a corresponding control loop. The formation of an integrated model of information representation of the organization with the contours of management and identified threats provides forming the architecture of the management system "high security of knowledge" about the existence and activities of the organization. For each defined control circuit (data, information, knowledge, intelligence / activity) it is proposed to form an additional control circuit of security.</p>
<b>T.3-D.2-O.2</b>	<b>UAV FLEET BASED ACCIDENT-MONITORING SYSTEMS WITH AUTOMATIC BATTERY REPLACEMENT SYSTEMS: ALGORITHMS FOR JUSTIFYING COMPOSITION AND PLANNING USE</b>
02.25 p.m - 02.50 p.m.	<p><u>Igor Klyushnikov</u><sup>1</sup>, <u>Herman Fesenko</u><sup>1</sup>, <u>Vyacheslav Kharchenko</u><sup>1</sup></p> <p><i>1.National Aerospace University "Kharkiv Aviation Institute" (KhAI), Department of Computer Systems, Networks and Cybersecurity (Ukraine)</i></p>

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	<p>The existing approaches suggest that justifying robotic monitoring systems composition and use planning are carried out through a set of predefined missions. The paper proposes the algorithms of justifying composition and utilization of monitoring systems for critical infrastructure objects based on the theory of transport systems considering possible changes in the monitoring missions. The considered monitoring system comprises a fleet of unmanned aerial vehicles (UAV fleet) and automatic battery replacement systems. The first algorithm provides a procedure for defining the monitoring system composition and the second one provides using the UAV fleet and the automatic battery replacement systems taking into account the requirements for the number of ground objects from which data needs collecting, range, transmission frequency, volume of the transmitted data, and operation time. The UAV fleet is considered as a transport subsystem responsible for collecting data from the defined ground objects of the critical infrastructure and transmitting this data to the crisis center, whereas the automatic battery replacement systems form a support subsystem responsible for functioning an air component (in this case, the UAV fleet). Various variants of the algorithms utilization are shown and discussed. The case study for algorithms and decision-making system deployment is described for NPP utility monitoring. In this case UAV fleet based system adds standard PAMS (post-accident monitoring system) and ASMR (automatic system of monitoring of radiation) and provides increasing completeness and trustworthiness of information, and reliability and survivability of operated PAMSs and ASMRs. The next research steps are highlighted.</p>
<p><b>T.3-D.2-O.3</b></p>	<p><b>THREAT ASSESSMENT METHOD FOR BUILDINGS IN CASE OF TERRORIST ATTACKS</b></p>
<p>02.50 p.m - 03.15 p.m.</p>	<p><u>Marco Carbonelli</u><sup>1</sup>, <u>Mariachiara Carestia</u><sup>1</sup>, <u>Riccardo Quaranta</u><sup>1</sup> <i>1. Department of Industrial Engineering, University of Rome Tor Vergata</i></p> <p>The objective of this paper is to outline the essential features of an original Threat Assessment Method for sites and buildings for the case of terrorist attacks with Explosive/CBR agents. The proposed method, based on an approach in six Steps, provides a structured guide useful to the Assessment Team in charge to evaluate the terrorist risks in a site/building. The method introduces two indexes, the general Attractiveness of a target and the Terrorist Capability. The general Attractiveness index is, in its turn, composed by two other sub-indexes: the Asset Attractiveness and the Vulnerability Attractiveness of the site/building. Using all these indexes it is possible to evaluate for a wide area - for example a district, a town or a region - a first rank for the sites/buildings that shows a potentially higher Attractiveness for the terrorists. In a similar way, the Terrorist Capability index provides a criterion for determining the easily applicable threats in a wide list of proposed Explosive/CBR weapons. Finally, the method proposes the evaluation of the Threat Probability Level, adopting a scale of 7-levels based on logarithm range, suitable for a complete Risk Assessment Methodology.</p>
<p><b>T.3-D.2-O.4</b></p>	<p><b>RESIST - "RESilience Support for critical infrastructures through Standardised Training on CBRN"</b></p>
<p>03.15 p.m - 03.40 p.m.</p>	<p><u>Silvia D'Adda</u><sup>1</sup>, <u>Daniele Di Giovanni</u><sup>2</sup>, <u>Andrea Chierici</u><sup>2</sup>, <b>RESIST STAFF</b> <i>RESIST Staff: Silvia d'Adda<sup>1</sup>, Federico Benolli<sup>1</sup>, Andrea Chierici<sup>2</sup>, Daniele di Giovanni<sup>2</sup>, Francesco Geriz, Paola Tessari<sup>3</sup>, Michele Nones<sup>3</sup>, Giampaolo Santini<sup>4</sup>, Vincenzo Puccias<sup>5</sup>, Olivia Loredans<sup>5</sup>, Giuseppe Paduanos<sup>5</sup>, Luigi de Dominicis<sup>6</sup>, Vasile Somoghi<sup>7</sup>, Flaviana Rotaru<sup>7</sup>, Eugenia Ghita<sup>7</sup></i></p> <p><i>1 SAFE</i> <i>2 Department of Industrial Engineering, University of Rome Tor Vergata (Italy)</i> <i>3 IAI (Institute for International Affairs)</i> <i>4 Joint NBC Defence School</i></p>

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	<p>5 Italian Firefighters 6 ENEA (National Agency for New Technologies, Energy and Sustainable Economic Development) 7 PROECO</p> <p>Operators of public spaces and Critical Infrastructures (CIs) are more and more confronted with many and varied types of events, natural or man-made, threatening the functioning of the infrastructure, the security of its operators and the general public. In this frame, CBRN events are gaining relevance, due to their potentially disruptive impact on the availability of basic services for the public and/or on the safety of end-users themselves.”. The project brings together public and private actors for enhanced CBRN preparedness and response in the event of a CBRN accident/attack at Critical Infrastructures. The project aims to create the first 10 CBRN intervention groups within Critical Infrastructures by training and equipping public and private operators to operate in contaminated environments, ensuring the safety of the staff, the security of the facility and effective coordination as well as communication with first responders. A first pilot training was completed setting the basis to enhance the preparedness, prevention and protection in case of a CBRN event involving train transport infrastructures. The entire process will set the basis for the proposal of a voluntary certification at EU level, the CBRN Resilience Label, for public and private operators of CIs.</p>
<b>T.3-D.2-O.5</b>	<b>EU COE PROJECT P73 – “PROTECTION OF CRITICAL INFRASTRUCTURES IN LEBANON, JORDAN AND IRAQ” - IN ITS LEBANESE COMPONENT</b>
03.40 p.m - 04.05 p.m.	<p><u>Emmanuel Bouquot<sup>1</sup>, Alessandro D’Autillio<sup>1</sup>, Omar El Samad<sup>1</sup></u> <sup>1</sup> SAFE</p> <p>The EU is enhancing its relationship with Iraq, Jordan and Lebanon and seeks to support these countries develop into a stable, democratic, politically open and economically strong neighbours. In this frame it is committed to exchange best practices in the field of Chemical, Biological, Radiological and Nuclear (CBRN) disaster (natural and man-made) prevention, preparedness and response. The Centres of Excellence Project 73 strives to reduce the vulnerabilities of critical assets, systems and networks. P73 project in Lebanon is responsible for setting the protocols for implementation of physical protection of the High Commanders, acquisition, installation and testing of appropriate CBR systems and secure zone/crisis room, training of personnel responsible for the protection of specific critical physical and virtual assets and infrastructures (CI) in the region, as to achieve critical command chain protection. The project has supported the COVID19 emergency through the provision of materials, strategic plan, and assessment of hospitals preparedness to deal with COVID19 cases. Furthermore, in the aftermath of the explosion in Beirut on the 4th of August, the project as initiated immediate and additional support for assessing chemical facilities.</p>
<b>T.3-D.2-O.6</b>	<b>CISINT/OSSISNa</b>
04.05 p.m - 04.30 p.m.	<p><u>Federico Sesler<sup>1</sup>, Vincenzo Iavarone<sup>1</sup>, Claudio Todaro<sup>1</sup>, Katia Petrini<sup>1</sup>, Stefano Di Traglia<sup>1</sup></u> <sup>1</sup> Italian Center for Intelligence and Strategy (CISINT)</p> <p>The Observatory for Security of National Strategic Industrial System (O.S.S.I.S.Na.), an independent initiative created within the Italian Center for Intelligence and Strategy (CISINT), is an project aimed at investigating issues related to the protection of national strategic industrial assets (companies and supply chains), which are fundamental for the Nation and for its social wellness. O.S.S.I.S.Na. consists of a team of experts from institutional, industrial and academic worlds. This initiative promotes training courses in the academic, institutional and corporate fields. It also organizes events such as</p>

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	<p>seminars, webinars, and contributions on mass media to raise awareness of issues relating to the protection of the Italian National Strategic Industrial System. It operates in the several areas of study (methods &amp; best practices, technology, legislation &amp; regulations, geopolitics), also developing its own capacity to propose solutions to issues for the decision-maker in the public sector.</p>
<p><b>T.3-D.2-O.7</b></p>	<p><b>INTERNET OF THINGS (IOT) AND EDGE COMPUTING AS ENABLING TECHNOLOGIES OF CONTEXT AWARENESS AND HUMAN FACTORS MONITORING IN CBRN OPERATIONAL ENVIRONMENT</b></p>
<p>04.30 p.m - 04.55 p.m.</p>	<p><u>Pietro Rossetti</u><sup>1,2,3</sup>, Fabio Garzia<sup>4,5,6</sup>, Nicola Silverio Genco<sup>2</sup>, Antonio Sacchetti<sup>1</sup></p> <p><i>1Tera Srl, Conversano (BA) 70014, Italy</i>  <i>2S.T.A.S.A. Studies Center, Rome 00137, Italy</i>  <i>3University of Rome Tor Vergata, Rome 00173, Italy</i>  <i>4Safety &amp; Security Engineering, DICMA - University of Rome La Sapienza, Rome 00185, Italy</i>  <i>5Wessex Institute of Technology, Southampton SO40 7AA, UK</i>  <i>6European Academy of Sciences and Arts, Salzburg A-5020</i></p> <p>Human Factors monitoring under the critical CBRN environment reduces the likelihood of errors or injuries by first responders who carry out operations within an unknown workspace. Indeed, thanks to the monitoring, analysis and assessment of physical and mental workload and manual handling of equipments by first responders, it is possible to increase safety, efficiency and effectiveness. The Internet of Things (IoT) and Edge computing, contextualizing the collected IoT data, promises to enhance the CBRN situational awareness by working on the human factors aspects with a view to context-aware reasoning. IoT and edge computing enabling technologies envisage operators needs and behaviours by gathering information about biophysiological conditions, emotional state and operational data by first responders. This study aims to introduce the edge computer for data fusion in tactical networks and computational services, fully integrated in IoT solutions of remote monitoring of Human factors. These latter, related to Human Performance and health of first responders, may prove useful as innovative tools in CBRN incident management.</p>
<p><b>T.3-D.2-O.8</b></p>	<p><b>A COMPREHENSIVE BIBLIOGRAPHIC SURVEY OF THE STANDARD ROUTING PROTOCOLS IN FLYING AD HOC NETWORKS</b></p>
<p>04.55 p.m - 05.20 p.m.</p>	<p><u>Orchu Aruna</u><sup>1</sup>, Amit Sharma<sup>2</sup></p> <p><i>1. Narasaraopeta Engineering College, Andhra Pradesh, India</i>  <i>2. Lovely Professional University, Punjab, India</i></p> <p>Nowadays wireless ad hoc networks are used in various approaches. UAV ad hoc networks are well organized networks compared with other ad hoc networks such as mobile and vehicular ad hoc networks. Most of the FANET routing protocols extend from MANETs and VANETs. So that the adaptive data relaying is very crucial for existing protocols of FANETs. The environment also changes the transmission exposure of infrastructures. However, the machine learning reinforcement-based technique namely called as Q-learning is an adaptive technique to handle the greatly changing aspects of FANET with conversational criticism as input, which provide adaptive routing scheme. In Q-learning, representatives might frequently alter their accomplishment approaches rendering to the incentive of conversational criticism to higher adapt to the energetic and unmaintainable topology. This paper proposes a Q-learning based adaptive routing protocol to adapt the unsustainable FANET topology. The existing routing protocols based on Q-learning uses a fixed value for parameters. In contrast, a proposed routing protocol can be adjusted adaptively to the value of Q-learning parameters to adapt to a apotheosis changing aspects of FANETs.</p>

**TECHNICAL TABLE 3. Cybersecurity, Critical Infrastructure, IoT and AI Investigation**

Chairpersons: Prof. Parag Chatterjee, Prof. Oleg Illiashenko and Dr. Umberto Battista

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<b>T.3-D.2-O.9</b>	<b>IOT BASED INDOOR AIR QUALITY MONITORING AND CONTROL SYSTEM USING RASPBERRY Pi4</b>
05.20 p.m - 05.45 p.m.	<p>Syed Faiazuddin<sup>1</sup>, M.V. Lakshmaiah<sup>1</sup>, K.Tanveer Alam<sup>2</sup></p> <p>1. Department of Electronics, S.K.University, Anantapuramu, A.P.India 2. Department of Electronics, Rayalaseema University, Kurnool, A.P.India</p> <p>The present work consists of IoT based Indoor Air Quality Monitoring and control system using Raspberry Pi4, Arduino Uno, Air purifier system. Here we are using IoT based indoor Air Quality system along with purifier system to take real time measurements. We measure here, the IoT based air quality system in different indoor environments. By using the embedded technology, CCS811 CO2 Air Quality Sensor, Grove - Air Quality Sensor v1.3, DHT 11 Temperature and Humidity Sensors are connected to collect the information in different environments. The ThingSpeak cloud technology is used for real time monitoring air quality parameters and storing the sensed information. This collected information is stored in the cloud and an inquiry is conducted for the analysis of air quality parameters. This Real time system is used to trace and analyze such information in ThingSpeak. ThingSpeak IoT platform is an analytic data platform, which can be used as analysis of live information of air quality parameters in cloud. In this paper we are using Python, PHP, MYSQL, Qt5 softwares are installed for programming to implement complete IoT system using Raspberry Pi4 and Arduino uno. Actually, in this work we introduce Air Purifier system to control the CO2, CO parameters in indoor environment. Arduino uno is used as sensors interface. All these implementation work which are used in the ThingSpeak to check the indoor environment parameters. It has been observed real time graphical representation of environmental parameters in ThingSpeak.</p>
<b>T.3-D.2-O.10</b>	<b>AUTOMATED ARABIC TEXT CLASSIFICATION USING MULTI-AGENT SYSTEM</b>
05.45 p.m - 06.10 p.m.	<p>Mounir Gouiouez<sup>1</sup></p> <p>1. Sidi Mohamed ben Abdellah University, Fez, Morocco</p> <p>Developing TC systems for Arabic documents is a challenging task due to the complex and rich nature of the Arabic language, and the way in which they are written according to its position in the sentence. Furthermore, Arabic is written from right to left, and its letters changing form according to their position in the word. There are various different methods for text categorization, including distance-based, decision tree-based methods, Bayesian naïf...etc. Furthermore, the large numbers of methods proposed are typically based on the classical Bag-of-Words model. In order to improve the accuracy of Arabic text categorization, therefore the accuracy of the results obtained, a new hybrid approach is proposed to improve the effectiveness of the automated techniques categorization. This paper presents the development of a concept and an associated architecture called the CAMATC (Cooperative Adaptive Multi-Agent System for Arabic Text Categorization), which is based on the combination of Multi-Agent Systems and the conceptual representation in the Arabic text categorization.</p>
<b>T.3-D.2-O.11</b>	<b>AUTONOMOUS ROAD SAFETY NAVIGATION SYSTEM FOR ENVIRONMENTAL HAZARDS</b>
06.10 p.m - 06.35 p.m.	<p>Anthony Ijeh<sup>1</sup></p> <p>1. CCG</p>

**TECHNICAL TABLE 3. Cybersecurity, Critical Infrastructure, IoT and AI Investigation**

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	<p>Our comprehension of technologies used for modelling motor navigation systems is connected to transport road infrastructure and not events which change the course of a motorist's journey. However, we know from existing literature and government reports that unfixed variables are the key determinants which should be used to connect Satellite Systems used for modelling systems. Complex variables which affect the course of a motorist's journey can be understood by constructing a formal model for network formation using an adaptable grid. This paper presents rules identified in the model to test determinants which impact motorists using transport road infrastructure and prototype for constantly exploring determinants. The model connects the determinants which affect the course of a motorist's journey. The unified system uses determinants from a wide range of complex unfixed variables to enable the unified system to adapt to its environment. Trial results showed the navigation devices can be used on road infrastructure to drive safely.</p>
<p><b>T.3-D.2-O.12</b></p>	<p><b>REVISITING THE CYBER RISK ASSESSMENT CAPABILITY APPROACH FOR 4TH PARTY VENDORS: THE CASE OF X</b></p>
<p>06.35 p.m - 07.00 p.m.</p>	<p><u>Anthony Ijeh</u><sup>1</sup> 1. CCG</p> <p>Cyber risk assessment capability defines the nature of the challenge for organisations and enables the identification of information asset and threat listing. Managing cyber risk needs input from stakeholders to assure cyber risk assessment capability is thorough. Key areas such as management engagement, recruiting skilled cyber risk analysts, developing auditable methods and tools, documented organisational, operational, and reporting channels, sustainable embedding, and integration. These areas whilst key to cyber risk assessment capability rarely determine in full the impact of 4th party supplier risk on business. This paper presents findings after evaluating the cyber risk assessment capability approach to risk from a 4th party supplier.</p>



**TECHNICAL TABLE 4. Radioactive and Nuclear threats [11 December 2020,02.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time), Virtual Room: Archimede]**

<b>T.4-D.2-O.1</b>	<p><b>NERIS: EUROPEAN PLATFORM ON PREPAREDNESS FOR NUCLEAR AND RADIOLOGICAL EMERGENCY RESPONSE AND RECOVERY – RESEARCH CHALLENGES</b></p> <p>Eduardo Gallego<sup>1</sup>, NERIS Management Board members and NERIS R&amp;D Committee members<sup>2</sup></p> <p><i>1. Universidad Politécnicna de Madrid and Management Board of NERIS</i></p> <p><i>2. <a href="https://eu-neris.net/about-neris.html">https://eu-neris.net/about-neris.html</a></i></p> <p>NERIS is the European Platform on preparedness for nuclear and radiological emergency response and recovery. The mission of NERIS is to establish a forum for dialogue and methodological development between all European organisations and associations taking part in decision making of protective actions in nuclear and radiological emergencies and recovery in Europe. The objectives of the Platform are to contribute to: (1) improve the effectiveness of current approaches, (2) promote more coherent approaches, (3) identify gaps and needs for further developments, (4) address new and emerging challenges in the field and (5) maintain and improve know-how and technical expertise among all interested stakeholders.</p> <p>Currently, the members of this Platform consists of 67 organisations from 27 countries, belonging to two categories, so-called Colleges: European, national, regional and local authorities, technical support organisations (TSO), operators and professional organisations; and research institutes, universities, non-governmental organizations (NGO), consultants, and other national and local stakeholders. The Platform is open to new worldwide incorporations.</p> <p>The experience gained during the last decades, largely based on the lessons learned from the Chernobyl and Fukushima accidents, points out the complexity of the management of nuclear or radiological emergency response and recovery. The Platform aims to enhance confidence in the solutions, reduce overlapping work, produce savings in total costs of research and implementation, and make better use of existing competences and research infrastructures in Europe.</p> <p>NERIS has developed a Strategic Research Agenda (SRA) that comprises three challenge areas: (1) radiological impact assessment during all phases of nuclear and radiological events; (2) countermeasures and countermeasure strategies in emergency and recovery, decision support and disaster informatics; and (3) setting-up a trans-disciplinary and inclusive framework for preparedness for emergency response and recovery. Besides developing quality science, it is necessary to emphasize the importance of setting up a multi-disciplinary and multi-stakeholder approach to address these research challenges.</p>
<b>T.4-D.2-O.2</b>	<p><b>SIMULATIONS AND CONVOLUTIONAL NEURAL NETWORKS FOR AUTOMATING RADIO-ISOTOPE IDENTIFICATION AND DEVELOPMENT OF AN ON-LINE NUCLEAR TEACHING LABORATORY – O-LAB</b></p> <p>Tzany Kokalova Wheldon<sup>1</sup>, Anthony N. Turner<sup>1</sup>, Carl Wheldon<sup>1</sup>, Angus Hollands<sup>1</sup>, Mark Griffiths<sup>3</sup>, Dawid Hampel<sup>1</sup>, Pedro Santa Rita Alcibia<sup>3</sup> and Martin Freer<sup>1</sup>, Mark R. Gilbert<sup>2</sup> and Lee Packer<sup>2</sup>, Jonathan Burns<sup>3</sup></p>

**TECHNICAL TABLE 4. Radioactive and Nuclear threats**  
 Chairpersons: Prof. Francesco d'Errico, Prof. Tzany Kokalova Wheldon and Prof. Eduardo Gallego  
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	<p>1. School of Physics and Astronomy, University of Birmingham, Birmingham B15 2TT, UK                  2. UKAEA, Culham Science Centre, Abingdon, Oxfordshire, OX14 3DB, UK                  3. AME plc, Aldermaston, Reading, RG7 4PR, UK</p> <p>A general purpose detector simulation has been developed for HPGe and scintillator detectors capable of producing high-quality spectra for a variety of radioactive sources under many different shielding scenarios. This simulator was used to generate training data based on nine commonly used radioactive isotopes. Data are combined to yield multiisotope spectra together with implementing gain-shifts, background, and a range of spectra with very different counting statistics. A model based on a Convolutional Neural Network (CNN) has been developed and then trained using these generated data and tested on a variety of experimental spectra. The model performed extremely well – making reliable predictions across a wide range of scenarios.</p> <p>Part of this work was used as the basis for the development of an On-line nuclear LABORatory software tool (O-LAB) for educational purposes. An overview of this work will be presented together with additional development of the simulator to coincidence systems.</p>
T.4-D.2-O.3	<p align="center"><b>TESTS AND PERFORMANCES OF A SPECIAL IDENTIFIER OF NUCLEAR THREATS AND SNM IN REALISTIC SCENARIOS</b></p>
02.50 p.m - 03.15 p.m.	<p><u>Giacomo Mangiagalli<sup>1</sup></u>, Massimo Morichi<sup>1</sup>, Matteo Corbo<sup>3</sup>, Isacco Bonesso<sup>2</sup>, Luca Stevanato<sup>2</sup></p> <p>1. CAEN SpA - Spectroscopy Division - Via Vetraia, 11, 55049 Viareggio UK                  2. Padova University - Physics department - Via Francesco Marzolo, 8, 35121 Padova</p> <p>Increase of concerns in global nuclear security oblige to consider real scenarios of Shielding and Masking and assuring the identification of a radiological threats and Special Nuclear Material (SNM) with high level of efficiency. This paper presents the results of extensive tests conducted for more than 4 years, towards the realization of a portable systems for the measurement and identification of radioactive material and, at the same time, determine of SNM isotopes in real time without the support from expert's presence: U, Pu-239, PuWG, UWG, Am-Be, Am-Li, or their combination with masking sources and shielding. The performances of the devices are exceeding the reference standards in sensitivity and furthermore for its capability of SNM identification. Typical detection time for this kind of measurement is 1s for gamma emitters, 2s for neutron emitters and 1 minute for identification including shielding. This paper presents a breakthrough portable radioactive isotope identifier. This device, with simultaneous detection of gamma rays and neutrons, detects radioactive source as SNM, medical, industrial and NORM. The exclusive feature of this instrument is the capability to discriminate between fission sources (<sup>252</sup>Cf) and alpha-n type sources (Am-Be) from Plutonium and Uranium through an innovative algorithm. Individual thresholds for neutron and gamma are calculated to allow detection with 95% detection probability for a dose rate of at least 50 nSv/h. Alarms are triggered separately. The neutron source detection has also been proved in a gamma ray field up to 100-300 μSv/h. The electronics is equipped with two analog inputs and two high voltage power supplies in a small form factor thus becoming an enabling technology for higher-performance yet portable radioactive isotope identifier device, which can perform data fusion analysis. An additional inorganic scintillator is also embedded, giving the capability of calculating Pu and U enrichment grade through characteristic gamma emission lines.</p>

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T.4-D.2-O.4	<p align="center"><b>SEDEX-NRBO FIELD EXERCISE. A CRITICAL REVIEW EXERCISE OF DETECTION OF NUCLEAR AND RADIOACTIVE MATERIAL IN A POST ATTACK SCENARIO</b></p>
03.15 p.m - 03.40 p.m.	<p><b>Javier Quiñones<sup>1</sup>, Benavente M<sup>a</sup> Ángeles<sup>2</sup>, Fernández Marta<sup>2</sup>, Mingorance Emiliano<sup>2</sup>, Serrano Julio<sup>2</sup>, Torres José Antonio<sup>1</sup>.</b></p> <p><i>1. Guardia Civil. Interior Affairs Ministry. C/ Batalla del Salado, 32. 28045 – Madrid. Kingdom of Spain</i>  <i>2. Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Avenida Complutense nº 40, 28040 Madrid. Kingdom of Spain.</i></p> <p>One of the key factors for reinforcement the detection and characterisation of nuclear and radioactive material out of regulatory control and prepare the response against the CBRN attack is to have a training calendar of the law enforcements units. This field and table top exercise must be focussed in the following aspect: training with the technical device used, protocols used, detection and response against any CBRN threat.</p> <p>The results presented are within the framework of a collaboration agreement signed between the Civil Guard and CIEMAT and IAEA project. The work carried out was focused on evaluating the measurement capacity of the different equipment used by the SEDEX-NRBO Unit of Guardia Civil. This paper is focused on the optimization of the different working protocols for acting in radiological/nuclear scenarios by studying different quality standards as sensitivity, precision and accuracy (among others) of the measurement devices used by this NRBC Unit. The approach was the determination of the dose rate by facing these equipments to radioactive sources of <sup>137</sup>Cs and <sup>60</sup>Co of known activity. By repeating this test n times (n &gt; 10 measurements) it was possible to determine the capacity of each of the equipment used by the NRBC Unit and its accuracy and precision in the measurement. This experimental procedure made it possible to know the behaviour of the equipment used and determine the appropriate choice of these according to the activity level, and always based on the necessary requirements in the particular scenario.</p>
T.4-D.2-O.5	<p align="center"><b>THE USE OF JRODOS DECISION SUPPORT SYSTEM IN EVALUATING THE SIZE OF EMERGENCY PLANNING ZONES OF A NUCLEAR POWER PLANT</b></p>
03.40 p.m - 04.05 p.m.	<p><b>Gurdal Gokeri</b></p> <p><i>1. Hacettepe University, Nuclear Engineering Department, Turkey</i></p> <p>Organizations authorized by the regulatory body for the construction, operation and decommissioning of nuclear power plants are obliged to demonstrate that the calculated radii of the emergency planning zones are smaller than the default sizes prescribed in the National Radiation Emergency Plan (URAP) in accordance with the related regulation. In this study, the methodology on atmospheric dispersion analyses performed for evaluating the suitability of the extent of the emergency planning zones for prospective nuclear power plants in Turkey is described. First, the default size of the emergency planning zones and emergency planning distances given in URAP is presented. Next, selected dosimetric criteria and the “representative person”, which are to be taken into consideration in the analyses, are determined. Meteorological data that could be used in the calculations are presented. A case study, the scope of which is similar to the performed analyses for the preparation of the site evaluation report, is executed. The emergency decision support system JRODOS and the three-dimensional meteorological data supplied by the National Centers for Environmental Prediction are used in the calculations. This study demonstrates how the generic criteria defined by the International Atomic Energy Agency and beyond design basis conditions in nuclear power plants can be taken into consideration in calculating the extent of the emergency planning zones.</p>

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T.4-D.2-O.6	<b>WHAT DOES THE UME (Military Emergency Unit) CONTRIBUTE IN A NUCLEAR OR RADIOLOGICAL EMERGENCY?</b>
04.05 p.m - 04.30 p.m.	<p data-bbox="370 262 911 316"><b>Antonio Nuñez Ortuño, Luis Rodríguez Álvarez de Lara</b>  <i>Military Emergency Unit. Ministry of Defence. Spain</i></p> <p data-bbox="370 323 1127 560">UME, the Military Emergency Unit of Spain, intends to improve the state's response to emergencies, being the first of the Armed Forces units to intervene in this kind of situations, and creating a true specialization, with all that means regarding equipment, specific training and own procedures and doctrine. This Unit has capability to support external and internal emergency plans of nuclear power plants, through the use of different materials and specialized personnel. Some of these capabilities are: 1- Deployment of a command post for the command and control of the intervention, advice, risk analysis and prediction of the evolution of radiological clouds.</p> <p data-bbox="370 567 1127 615">2- Stand off and punctual radiological detection, use of robot with detector to make measurements in high radiation areas without personnel exposure.</p> <p data-bbox="370 622 1127 669">3- Support with equipment, personnel and vehicles for the Radiological Surveillance Plan.</p> <p data-bbox="370 677 1127 724">4- Vehicles to support big fire extinguishing tactics, core cooling, radiological emission abatement, etc.</p> <p data-bbox="370 731 1127 778">5- Deployment of a Classification and Decontamination Station with the capacity to decontaminate the responders, population, vehicles and sensitive material.</p> <p data-bbox="370 786 1127 833">6- Support for the reestablishment of electricity services and the Nuclear power plant Command, Control and Communication system.</p> <p data-bbox="370 840 1127 924">7- Use of helicopters for reconnaissance, transmission of images in real time, make measurements with detectors, transport of interveners or plant personnel, transport of equipment for support such as generators or evacuation of injured personnel.</p> <p data-bbox="370 931 1127 979">8- Search, rescue and evacuation of people.</p> <p data-bbox="370 986 1127 1010">To sum up, the Military Emergency Unit has the necessary capabilities to fully support a nuclear emergency.</p>
T.4-D.2-O.7	<b>SMARTPHONES AS EMERGENCY PREPAREDNESS AND DISASTER RESPONSE SUPPORT DEVICES</b>
04.30 p.m - 04.55 p.m.	<p data-bbox="370 1082 1127 1137"><b>Francesco d'Errico<sup>1</sup>, Gordon A. Drukier<sup>2</sup>, Andrea Chierici<sup>3</sup>, Riccardo Ciolini<sup>1</sup>, Andrea Malizia<sup>3</sup>, Raffaele Zagarella<sup>4</sup>, Eric P. Rubenstein<sup>2</sup></b></p> <p data-bbox="370 1144 654 1168"><sup>1</sup> Scuola di Ingegneria, Università di Pisa</p> <p data-bbox="370 1175 685 1199"><sup>2</sup> Image Insight Inc., East Hartford, CT – USA</p> <p data-bbox="370 1206 754 1230"><sup>3</sup> Scuola di Ingegneria, Università di Tor Vergata, Roma</p> <p data-bbox="370 1237 853 1261"><sup>4</sup> Centro Interforze Studi Applicazioni Militari, San Piero a Grado, Pisa</p> <p data-bbox="370 1268 1127 1659">The recent nuclear crisis at Fukushima, Japan is a stark reminder that radiation emergencies can and do happen. The potential for other such disasters exists at the hundreds of other nuclear power plants around the world, some with designs identical to those in Fukushima. A large number of radiation accidents have also occurred involving the loss of custody of deliberate removal of radioactive sources and leading to significant or lethal radiation doses to several individuals. In addition to accidents, the potential use of nuclear and radioactive materials by terrorists has raised serious concerns. Preventing criminal transport of nuclear and radiological material is a priority for national security. While the primary concern has been with bringing radiological material into our countries, thousands of dangerous radiological sources are already within our borders, located in vulnerable locations in hospitals, food processing plants, and industrial sites. Monitoring these sources requires a pervasive, distributed network of sensors. This report illustrates a technology called GammaPix that uses digital video cameras as penetrating ionizing radiation detectors. Born from the need to eliminate spurious signals induced by cosmic rays in images of celestial</p>

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	<p>bodies, the approach has proved to be a powerful method capable of providing ubiquitous and low-cost radiation monitoring. The technology employs the inherent gamma-ray sensitivity of CCD and CMOS chips used in digital image sensors in surveillance cameras and cell-phone cameras. A variant of the technology is also described that uses mobile phones as virtual sensors of virtual sources positioned in sites of choice using Google Maps. This technology allows the performance of simulated exercises and is designed for the training of emergency response personnel.</p>
<p><b>T.4-D.2-O.8</b></p>	<p align="center"><b>AN APPROACH TO COORDINATE TRANS-BOUNDARY NUCLEAR EMERGENCIES: THE EUROPEAN HERCA-WENRA APPROACH</b></p>
<p>04:55 p.m - 05:20 p.m.</p>	<p><b>Alfredo Mozas García<sup>1</sup></b>  <i>1. Technical Coordinator of Emergencies. Deputy Direction for Emergencies and Security. Spanish Nuclear Safety Council (CSN)</i></p> <p>European countries have efficient emergency preparedness and response (EP&amp;R) arrangements that have been established since many years and are tested and challenged regularly. They allow authorities to issue recommendations for effective public protective actions. In the development of such arrangements, each European state defines its own priorities and objectives in planning for nuclear emergencies directly affecting its own territory. When several countries might be affected by the same accident, efficient emergency response may rest strongly on how large the differences among different countries' EPR arrangements are. Such differences can potentially have a significant effect. Populations could feel unequally protected, depending on where they live. Finding a way for aligning protective actions along adjacent national borders may indeed increase emergency response efficiency. During the very early phase of any accident, many parameters regarding reactor status, radioactivity release (time and amount) are likely to be poorly known. Thus, the uncertainties in terms of dose estimation and overall radiological impact are very large. The role of the decision-maker is to arrive at appropriate health protection measures possibly even without any dose estimation. This inevitably leaves room for flexibility in decisions, even where there is a rigid national framework. HERCA and WENRA have developed a European Approach that facilitates cross-border coordination during the early phase of a nuclear accident. Such approach is based on 'mutual understanding' among the countries, and requires actions to be taken during the planning and preparation phases of the EPR arrangements. The suggested presentation for the Conference will describe in more detailed the HERCA-WENRA Approach and the tasks to be considered before the accident among the neighbouring countries.</p>
<p><b>T.4-D.2-O.9</b></p>	<p align="center"><b>LARGE SCALE CONTAINMENT OF RADIOACTIVE CLOUDS</b></p> <p><b>Pérez Díaz José Luis<sup>1</sup>, Sánchez García-Casarrubios Juan<sup>2</sup>, Núñez Ortuño, Antonio<sup>3</sup>, Rodríguez Álvarez de Lara, Luis<sup>3</sup>, Iliev Petrov Mihayl<sup>4</sup>, Fernández Perea Gonzalo<sup>1</sup>, Ruiz Navas, Elisa María<sup>5</sup></b>  <i>(1)Universidad de Alcalá (UAH).                  (2)SAN JORGE TECNOLÓGICAS S.L. (SJT).                  (3)UNIDAD MILITAR DE EMERGENCIAS (UME).                  (4)MAG SOAR S.L. (MAGSOAR).                  (5)Universidad Carlos III de Madrid (UC3M)</i></p>

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	<p>One of the largest impacts of Nuclear catastrophes such as Chernobyl (1986) or Fukushima (2011) is associated to the production of large toxic clouds that rapidly spread over thousand kilometers. Even in normal operation, the release of radioactive aerosols to the atmosphere is not unusual.</p> <p>In this sense there is a clear need to provide a practical technology to collapse these toxic clouds as soon as possible, preventing its spreading. COUNTERFOG® technology addresses this need. COUNTERFOG® is a recent technology for rapid decontamination based on the generation of dynamic nano-fog cones able to catch up and collapse air-borne nuclear aerosols.</p> <p>A large-scale operational demonstration was carried out in the abandoned Hospital of the NATO Air Base of Torrejon in summer 2019. The operability of COUNTERFOG® technology was demonstrated against radiological aerosols both indoors and outdoors.</p> <p>A first indoors test recreated a nuclear fire in a building using artificial smoke. A set of four B1: 2 COUNTERFOG® nozzles created a protective curtain that acted as an effective barrier preventing the spread of the smoke and collapsing air-borne particles on a puddle on the floor.</p> <p>In a second outdoors test, a leak of a radioactive aerosol on top of the building was recreated using military smoke cans. A set of 4 COUNTERFOG® B1:1 nozzles placed on top of an aerial platform ladder truck created a dynamic fog cyclone collapsing the smoke and preventing its spreading.</p> <p>In conclusion, the operability of COUNTERFOG® technology to counteract radioactive clouds making to collapse them and preventing their expansion was satisfactory demonstrated in real scale. This provides a reliable, sustainable and affordable technology suitable to drastically mitigate the effects of accidental or incidental release of nuclear clouds.</p>
<p><b>T.4-D.2-O.10</b></p>	<p><b>FIRST RESPONDER SAFETY IN THE EVENT OF A DIRTY BOMB DETONATION IN URBAN ENVIRONMENT</b></p>
<p>05.45 p.m - 06.10 p.m.</p>	<p><u>Sergio Biancotto<sup>1</sup></u>, <u>Andrea Malizia<sup>2</sup></u>, <u>Marco D'ariento<sup>3</sup></u>, <u>Gian Marco Contessa<sup>3</sup></u></p> <p>1. Nuclear Engineer, Independent Consultant, Turin, Italy</p> <p>2. Department of Biomedicine and Prevention, University of Rome Tor Vergata</p> <p>3. ENEA Casaccia Research Center</p> <p>The malevolent dispersion of radioactive material, with the aim of contaminating people and the environment, is considered a credible terroristic threat. This article analyzes a hypothetical Dirty Bomb detonation in an urban area, estimating the radiological consequences to the involved population and to early response workers. The dispersion of radioactive material is simulated using the HOTSPOT code, considering the explosion of devices containing (alternatively) 60Co, 137Cs, 192Ir or 241Am sources, frequently used in medical or industrial settings. The resulting ground deposition is used to evaluate the stay time to reach selected levels of dose, calculated using the RESRAD-RDD software. Based on the dispersed radionuclide, the influence of personal protective respirators is analyzed. Confirming previous published results, this article illustrates that the radioactive material is diluted by the detonation, resulting in relatively low doses. However, the emergency workers stay time in the most contaminated area must be carefully planned, in order to limit the received dose. Due to the general fear of radiation, extensive psychological effects are expected in the public, irrespective of the evaluated radiation doses.</p>
<p><b>T.4-D.2-O.11</b></p>	<p><b>NEW TOOLS FOR TRAINING IN RADIOLOGICAL RISKS</b></p>
<p>06.10 p.m - 06.35 p.m.</p>	<p><u>Beatriz Gomez-Argüello<sup>1</sup></u>, <u>Borja Bravo<sup>1</sup></u></p> <p>1. TECNATOM</p>

	<p>Often First Responders are concern about how they should act against radiation during a real incident if they have no access to real dosimeters, radioactive sources or radiation detectors during their training. For this reason, during these last two years, Tecnatom has tried to remedy the problem of not delivering training in a radioactive environment, incorporating new elements and tools to theoretical and practical sessions. As a complement to a practical session with exempt radioactive sources, real dosimeters and different kind of radiation and contamination detectors, Tecnatom organizes a practical exercise using a radiation simulator, where the students can be trained in a non-radioactive environment. This radiation simulator includes simulated personal dosimeters, gamma radiation emission sources and a radiation monitor. All these devices are controlled from a touch-screen tablet that allows the instructor to create his own scenario, fixing the maximum doses for each dosimeter and the dose rate for each source. Each dosimeter can be configured to set off an alarm for individual dose level or dose rate. The instructor can follow the cumulative dose and instant dose rate detected by the dosimeters for each learner in real time and introduce modifications in all the parameters during the living session. On the other hand, to give more dynamism to the theoretical sessions, the instructor makes questions to the students using Kahoot to check his knowledge level and to identify if there is any concept that need to be reinforced and, additionally, he organizes a contest by teams (based on a popular tv program) about the notions previously explained. In both cases, the instructor uses the student answers to clarify concepts and solve doubts.</p>
<p><b>T.4-D.2-O.12</b></p>	<p><b>IN-SITU METROLOGY FOR DECOMMISSIONING NUCLEAR FACILITIES: AN OVERVIEW OF METRODECOM<sub>2</sub> PROJECT</b></p>
<p>06.35 p.m - 07.00 p.m.</p>	<p><u>Peter Ivanov</u><sup>1</sup>  <sup>1.</sup> National Physical Laboratory, UK</p> <p>Currently, there are 190 nuclear power reactors across the globe in a permanent shutdown awaiting or undergoing nuclear decommissioning. There are significant challenges associated with the process safe decommissioning and cleaning the from hazardous waste and materials. To address these challenges and ensure safe and cost effective disposal of such hazardous materials it is essential to develop methods for radiological characterisation of waste and materials originating from nuclear licenced sites. MetroDECOM<sub>2</sub> is a European Metrology project which focuses on the needs of the decommissioning process through the development and implementation of new measurement techniques, instruments, standards and reference materials to ensure the safe disposal of radioactive waste from decommissioning nuclear sites. The key to dealing with such wastes is accurately quantifying the radioactivity content, so that decommissioning can be planned and implemented to minimise the risk to members of the public and the environment. Since 2017 the 15 project partners which include metrology laboratories, universities and instrument manufacturers have been working on development of measurement techniques that can be used to measure radioactivity for planning decommissioning, for segregating and checking waste materials during demolition, and for monitoring the condition of waste packages in radioactive waste repositories. The talk is providing an overview and discuss the main outcomes of the MetroDECOM<sub>2</sub> project.</p>

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**TECHNICAL TABLE 5. CBRNe crisis and emergency management, Communication, Investigation and Forensic, Education and Training [11 December 2020, 08.20 a.m. - 01.00 p.m. (UTC+1 - Italian Time), Virtual Room: Galileo]**

<b>T.5-D.2-O.1</b>	<b>OPTIMISING COUNTER CBRN TRAINING AND EDUCATION</b>
08.20 a.m. - 08.45 a.m.	<p><u>Steve Johnson<sup>1</sup>, George Burke<sup>1</sup>, Keith Bullock<sup>1</sup>, Robert Elms<sup>1</sup></u> <i>1. U.K. British Army, less Steve who is Cranfield university</i></p> <p>The use of a systems approach to training is a critical component of continuous improvement. The U.K. Defence System Approach to Training support this and also allows for assurance and easy management, remaining flexible to changes in requirement. Counter CBRN training has often suffered from a momentum based on historical courses and can be tricky to change. This paper will explore the analysis and development of Counter CBRN capability through the application of this system. Examining both the introduction of new capabilities and the optimisation of old ones, it will explore the techniques which can be applied to generate a world class capability.</p>
<b>T.5-D.2-O.2</b>	<b>ABU DHABI POLICE PROCEDURES IN COVID-19 CORONAVIRUS DISASTER AND IMPORTANCE OF USED SMART TECHNOLOGY</b>
08.45 a.m. - 09.10 a.m.	<p><u>Abdullah Ali Ahmad Alhmoudi<sup>1</sup></u> <i>1. Abu Dhabi Police GHQ, United Arab Emirates</i></p> <p>Abu Dhabi Police in the emirate of Abu Dhabi are calling on residents to stay at home, and to follow the advice of only stepping out when necessary. "For your safety and the safety of others, stay home. You are responsible for your safety, and the safety of your family and the community at large," announced police officers in a number of different languages, including Arabic and English. The measures come after the Ministry of Interior and the National Emergency Crisis and Disasters Management Authority (NCEMA) issued a statement on March 23 on 2020, urging UAE citizens, residents and visitors to limit social contacts and avoid crowded places to ensure their safety and wellbeing. The public were also urged to use their own family cars with a maximum of three individuals per vehicle, not to visit public places and maintain social distancing protocols during family gatherings. UAE authorities also urged everyone not to visit hospitals except for critical or emergency cases, and to wear face masks if they suffer from chronic diseases or display flu symptoms. Abu Dhabi Police use AI helmets to scan for Covid-19 the helmets can measure the body temperatures of multiple individuals at the same time. A recent blood donation drive in the capital, Abu Dhabi Police came equipped with a new piece of kit.</p>
<b>T.5-D.2-O.3</b>	<b>SERIOUS GAME DEVELOPMENT FOR CBRNE TRAINING: A COMPARATIVE ANALYSIS IN VIRTUAL REALITY AND COMPUTER-BASED ENVIRONMENTS</b>
09.10 a.m. - 09.35 a.m.	<p><u>Burak Altan<sup>1</sup>, Servet Gurer<sup>2</sup>, Ali Alsamarej<sup>3</sup>, Damla Kivilcim Demir<sup>3</sup>, H. Sebnem Duzgun<sup>4</sup>, Mustafa Erkayaoglu<sup>2</sup>, Elif Surer<sup>1</sup></u> <i>1. Department of Modeling and Simulation, Graduate School of Informatics, Middle East Technical University, Ankara, 06800, Turkey</i> <i>2. Department of Mining Engineering, Middle East Technical University, 06800 Ankara, Turkey</i> <i>3. Department of Industrial Design, Middle East Technical University, 06800 Ankara, Turkey</i> <i>4. Mining Engineering Department, Colorado School of Mines, Brown Hall 268, CO 80401, USA</i></p>



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	<p>Crisis management and recovery after crisis conditions require extensive and detailed training of first responders (FR). Stages of such training are frequently implemented as physical exercises with an individual FR and/or team of FR executing crisis scenarios and specific tasks in real-time. Although such training is essential and inarguably beneficial, repeating the same training program can become an expensive and time-consuming task. Chemical, Biological, Radioactive, Nuclear, and explosives (CBRNe) attacks have become severe threats for countries over the past decade, and led related parties to focus on CBRNe training as a crucial research topic. In this study, two serious games — Hospital and Biogarden— were developed in virtual reality (VR) and personal computer environments for training purposes. The scenarios of these games were based on the EU H2020 European Network Of CBRN Training Centers (eNOTICE) project’s joint activities, which took place in France and Belgium. The main focus of the scenarios is based on crisis moments where the responsibilities of various FR such as doctors, nurses, local investigation teams are represented in a repeatable fashion within a virtual environment. The games were played by 16 CBRNe experts from the eNOTICE project who also participated in the physical training program in France and Brussels. Gamer profile, presence, system usability scale, immersive tendency questionnaire, and technology acceptance model questionnaires and open-ended questions were used for evaluation and extensive feedback. Results showed that the fun factor in video games enabled the users to experience a pleasant time with a more memorable learning experience. Additionally, according to most of the participants, the VR version of games made them feel much more “involved”.</p>
<p><b>T.5-D.2-O.4</b></p>	<p><b>ITALIAN FIRE AND RESCUE SERVICE ROLE IN THE PANDEMIC EMERGENCY – THE SECOND PHASE</b></p>
<p>09.35 a.m. - 10.00 a.m.</p>	<p><u>Luca Rosiello</u><sup>1</sup> <i>1. Italian Fire and Rescue Service – Central Directorate for Emergency (Italy)</i></p> <p>During the year 2020 the response to emergencies by the Italian Fire and Rescue Service was strongly influenced by the pandemic situation. The spread of the virus, the experience of the first phase and the regulatory framework have led to an evolution in the procedures and planning of the activities of the firemen. During the presentation, the current situation and the differences with the first phase will be illustrated.</p>
<p><b>T.5-D.2-O.5</b></p>	<p><b>THE EFFECTIVENESS OF TABLE TOP EXERCISES IN IMPROVING PANDEMIC CRISIS PREPAREDNESS</b></p>
<p>10.00 a.m. - 10.25 a.m.</p>	<p><u>Michael Ian Thornton</u><sup>1</sup>, <u>Colomba Russo</u><sup>2</sup> and <u>Alba Iannotti</u><sup>1,2</sup></p> <p><i>1. INAC, HESAR Association, University of Rome Tor Vergata</i> <i>2. Department of Industrial Engineering, University of Rome Tor Vergata</i></p> <p>The World Health Organization carried out a global survey in 2018 to ascertain the level of preparedness for pandemic influenza. It was discovered that simulation exercises to test national pandemic influenza preparedness plans were carried out in the previous 5 years, by 42 out of the 104 countries that completed the survey. The table top exercise (TTX) being the preferred format, with 86% of the countries using them. Although no table top exercise can convey a realistic picture of a pandemic, they can be used to assess plans, policies, and procedures, clarify roles and responsibilities, and identify resource gaps in an operational environment. However, table top exercises are only effective if they are properly designed, carefully conducted, fully evaluated, and most importantly, the results and recommendations identified are actually implemented.</p> <p>TTXs used as part of preparedness for pandemics are not cost free, a failure to implement the lessons learned from them can have both human and economic consequences. To understand the value of TTXs, a sample of national and large scale</p>

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	TTXs are examined in an effort to identify the effectiveness of table top exercises, as a part of improving pandemic crisis preparedness
<b>T.5-D.2-O.6</b>	<b>RISK ASSESSMENT, CHALLENGES, APPLICATIONS, THEORIES: A CASE STUDY FROM THE UNITED ARAB EMIRATES (UAE)</b>
10.25 a.m. - 10.50 a.m.	<p>Ibrahim Almarzouqi<sup>1</sup> <i>1. The United Arab Emirates Abu Dhabi Police</i></p> <p>The number of hazards and disasters that are occurred around the globe have increased in the recent years. Emergency service providers are always under challenge to deal with various hazards and risks that could potentially occur. However, those challenges' solutions vary from theoretical aspects to its practical implementation. This presentation will discuss the theoretical aspects of risk assessment and the implementation challenges that could face emergency service providers. The author has segmented the analysis of risk assessment into different parts. Firstly, the previous and current hazards, secondly, the future sight of hazards, on one side. However, the practical challenges would come from different angles such as legislation and policies, operational problems and demands, economic costs and other social factors. The author has used different data collection measures, and these include focus interviews, workshops among other data collection procedures.</p> <p>Results showed that the integration between the theoretical and the practical aspects is a crucial element to ensure an adequate risk assessment and prioritisation of hazards list. Hence, such process allows emergency service providers to intervene adequately.</p>
<b>T.5-D.2-O.7</b>	<b>REUSE: BIO-DECONTAMINATION OF FILTERING FACE PIECE RESPIRATORS AND MASKS FOR REUSE PROJECT DISSEMINATION</b>
10.50 a.m. - 11.15 a.m.	<p>Wilson Antunes<sup>1</sup>; Ricardo Vieira<sup>2</sup>; José Borges<sup>3</sup>; David Pêra<sup>2</sup>; Ivo Costa<sup>2</sup>; Fernando Antunes<sup>3</sup>; João Silva<sup>3</sup>; Fadhil Musa<sup>3</sup>; Raquel Nogueira<sup>3</sup>; Luís Costa<sup>4</sup>; Paulo Cruz<sup>5</sup> <i>1. Centro de Investigação da Academia Militar (CINAMIL), Unidade Militar Laboratorial de Defesa Biológica e Química (UMLDBQ), Av. Dr. Alfredo Bensaúde, 1849-012 Lisboa, Portugal;</i> <i>2. Centro de Química Estrutural, Faculdade de Ciências, Universidade de Lisboa, Campo Grande, 1749-016 Lisboa, Portugal;</i> <i>3. Delox, Tec Labs, Campus da FCUL Campo Grande 1749-016 Lisboa, Portugal;</i> <i>4. Fardas 3B, Rua António Macedo, 20 2840-175 Seixal, Portugal;</i> <i>5. Hospital das Forças Armadas, Azinhaga dos Ulmeiros, 1649-020 Lisboa, Portugal.</i></p> <p>As the pandemic is disrupting healthcare systems, stepping up efforts to protect those on the frontline is crucial to further combat the deadly COVID-19 disease. The pandemic revealed the healthcare systems to be unable of protecting healthcare personnel as Personal Protective Equipment (PPE) has been lacking in hospitals. It put healthcare workers at an immense risk of contracting the virus while treating the COVID-19 patients. Additionally, a worldwide shortage limited the use of PPE by the rest of the society, which could otherwise slow down the spread of the virus. In the USA only, over 10,000 health professionals contracted the virus and 821 died . There is no sign of relief as PPE stocks for hospitals will not be enough for the next several months, when the COVID-19's second wave hits.</p> <p>To address this critical problem, the REUSE consortium was built under the triple helix principle, where academic institutions/ research centres, enterprises and end-users were gather together, to bring the idea to the marked. REUSE has as partners: the academia - Faculdade de Ciências da Universidade de Lisboa, Centro de Química Estrutural and Instituto Dom Luiz, Centro de Investigação da Academia Militar (CINAMIL); industry - FARDAS 3B, with knowledge in moulding polymers such as PVC and DELOX, a technological start-up in the field of bio-decontamination; and End-users - Laboratório de Defesa Biológica (LDB) and Hospital das Forças Armadas, two Portuguese armed forces units, employed in the national response to SARS-COV-2.</p>

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<b>T.5-D.2-O.8</b>	<b>COUNTERFOG SYSTEM APPLIED INSIDE THE WAREHOUSE. VERIFICATION OF THE COUNTER RESPONSE AGAINST RADIOCHEMICAL ATTACK SCENARIO</b>
11.15 a.m. - 11.40 a.m.	<p><b>Quiñones Javier<sup>1</sup>, Domínguez Jose Antonio<sup>2</sup>, Pascual Laura<sup>2</sup>, Amigo Luis Jesus<sup>2</sup>, Cobo Jose Manuel<sup>2</sup>, Fernández Marta<sup>2</sup></b></p> <p><i>1. Guardia Civil. Interior Affairs Ministry. C/ Batalla del Salado, 32. 28045 – Madrid. Kingdom of Spain</i> <i>2. Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Avenida Complutense nº 40, 28040 Madrid. Kingdom of Spain.</i></p> <p>Chemical and radiological emergencies can be caused by terrorist attacks, such as the use of CWA, as well as from industrial accidents. Whatever the trigger, these are difficult to manage because they involve the rapid dispersal and exposure to toxic chemicals agents that, depending on scenario, compromise security and human health. These risks justify the interest in the development of reliable processes for the efficient capture of toxic agents airborne released to the environment which is the objective of this work.</p> <p>The proposed procedures include the used of solid sorbents (metallic oxides), fog with additives previously tested for other CWA and RN surrogates such as isopropanol and specific additives as those based on Ag<sup>+</sup> for iodine, as well as different combination of them. The different combination of these countermeasures were tested and evaluated in order to achieve maximum cleaning efficiency and speed of action. These tests were performed at different scales ranging at laboratory scale, pilot plant, and inside the building (large scale).</p> <p>The effect of the combined countermeasure is much greater than that of each of the measures separately, since, as has been shown, the joint interaction favors the reduction of the concentration of the dispersed radiochemical agent in the atmosphere. For the specific case of iodine, the results obtained show that the cleaning effect of the COUNTERFOG system countermeasure with the Ag<sup>+</sup> additive is superior to the solid sorbent initially tested. Furthermore, the capability at real scale of the propounded system for minimising the effect of chemical and/or radionuclide dispersion in the atmosphere have been confirmed.</p>
<b>T.5-D.2-O.9</b>	<b>ANALYSIS OF CORONA VIRUS OUTBREAK IN CHINA: CRISIS COMMUNICATION CHALLENGES AND LESSONS FOR A SAFE FUTURE</b>
11.40 a.m. - 12.05 a.m.	<p><b>Muhammad Usman Asghar<sup>1</sup>, Saman Choudary<sup>2</sup></b></p> <p><i>1. Department of Government and Public Policy, National Defence University, Islamabad, 44000, Pakistan.</i> <i>2. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></p> <p>While the world was celebrating the new year on the eve of 31st December 2019, a deadly crisis was in the making in the form of an epidemic due to a rare Corona virus (COVID-19) in the city of Wuhan, China. The dawn of 2020 was to shock the world with the breaking news about the outbreak of contagious disease in China. This disease has spread to almost 25 countries and has claimed more than 1400 lives in China only. Currently, China is leading the battle against the massive COVID-19 catastrophic health emergency within its borders whereas Chinese people are forced to live under a virtually lockdown situation. This alarming situation has reemphasized the dire need of effective crisis communication in dealing with such chaotic and traumatic environment due to the asymptomatic contagious virus transmission. According to media reports, it seems that Chinese government has opted for the strategy of restricting the physical movement of citizens in the affected areas besides imposing media blackout like situation to avoid panic and chaos due to misinformation. In this backdrop, the study aims to analyse two scenarios, first is the current approach adopted by the Chinese in a crisis situation and the second, a hypothetical one where Chinese have opted for well-planned crisis communication strategy. This research will unfold the challenges and lessons for the crisis communication experts to act more cautiously in similar future health emergencies. The analysis will explain the productivity (counter-productivity) of</p>

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	<p>the policy decision in epidemic situations like COVID-19, not only managing the crisis communication but also to curtail the spread of deadly viruses to other parts of the world. Furthermore, this research will analyse the potential role of social media in crisis communication as a tool to support governments rather a detrimental approach in crisis situations.</p>
<b>T.5-D.2-O.10</b>	<b>MANAGEMENT OF TECHNICAL EMERGENCY RESCUE AND OF BIOLOGICAL RISKS IN THE COVID-19 ERA</b>
12.05 a.m. - 12.30 a.m.	<p><u>Edoardo Cavalieri d'Oro</u><sup>1</sup> <i>1. Italian Fire and Rescue Services – Advanced Regional CBRN Unit of the Lombardy Region - Milan (Italy)</i></p> <p>Since the beginning of March 2020, the city of Milan had to face, for the first time in Europe and in the world, the spread of the coronavirus with levels of contagiousness that soon became pandemic. On March 7, the Italian government declared a national lockdown aimed to contain the spread of the virus; nevertheless, the public safety and urgent technical assistance components regularly guaranteed the service to citizens, facing also the risk of contagion. In this context, the CBRN unit of the Milan fire and rescue services set up a prompt system aimed to monitor and protect the aforementioned forces. This work describes the constituent components of this system, based on the specificity provided by the biological laboratory settled down by the Milan CBRN unit.</p>
<b>T.5-D.2-O.11</b>	<b>ROLE AND TASKS OF THE NATIONAL ARMAMENTS DIRECTORATE LAND ARMAMENT DIRECTORATE (DAT). CBRN AS A DEAL: TECHNICAL CHALLENGES AND INVOLVEMENTS</b>
12.30 a.m. - 12.55 a.m.	<p><u>Salvatore Masi</u><sup>1</sup> <i>1. Brig. Gen. National Armaments Directorate Land Armament Directorate (DAT), Italian Ministry of Defence (Italy)</i></p> <p>Land Armament Directorate (DAT) is in charge of procurement for Defense weapons systems and material. CBRN equipment and, materials are part of that procurement activity. Moreover, DAT issues technical norms and checks the applicability of them to the material of defense interest in the CBRN field too. In the sector of land armaments, DAT manages parts of the technological research programs of the National Plan for the Military Research, a kind of co-founding of applied research.</p>
<b>T.5-D.2-O.12</b>	<b>CBRNE TRAINING IN VIRTUAL ENVIRONMENTS – STRUCTURED ANALYSIS &amp; PRACTICAL GUIDELINES</b>
12.55 a.m. - 01.20 p.m.	<p><u>Markus Murtinger</u><sup>1,2</sup> <i>1. USECON – The Usability Consultants (Austria) 2. AIT Austrian Institute of Technology (Austria)</i></p> <p>Virtual reality (VR) is increasingly gaining acceptance in the education and training sector. VR allows users to immerse in situations and gives the feeling of being physically there. In simulated environments, trainees are confronted with dangerous situations that would otherwise be too dangerous or not allowed and learn the correct skills and behaviour. With VR trainees can develop their skills in realistic settings but without real danger, at any time and independent of location, but also record and analyse them. Virtual environments offer a maximum of experimental control, are easy to iterate and allow new forms of feedback and performance monitoring. Together with the trainer, recorded sessions can be used to discuss issues and alternative behaviour can be tested. The immersion that is created in the training increases the learning effect and the retention of acquired knowledge. Lack of technology acceptance, economic aspects, incomplete requirements and technical limitations are the main weaknesses of VR opportunities. This paper gives a comprehensive overview of current training solutions</p>

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	<p>as well as of research challenges in the field of VR for education and training in the security sector. Based on results and practical experiences from several studies regarding VR security training, this paper provides recommendations for the introduction of VR into CBRNe training and discusses the opportunities and weaknesses. The results are presented in on the bases of SWOT analysis methods (Strengths, Weaknesses, Opportunities and Threat) and the findings are translated into practical guidelines. The aim is to enhance the awareness of what extensions are already possible with VR in CBRNe training, how these can be implemented, and which developments are still required.</p>
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**TECHNICAL TABLE 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science**

Chairpersons: Dr. Ralf Trapp, Cpt.Hojun Kwon and Prof. Donato Morea  
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**TECHNICAL TABLE 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science [11 December 2020, 08.20 a.m. - 01.00 p.m. (UTC+1 - Italian Time), Virtual Room: Archimede]**

<p><b>T.6-D.2-O.1</b></p>	<p><b>NON-STATE ACTORS, CHEMICAL WEAPONS, AND THE CHEMICAL WEAPONS CONVENTION</b></p>
<p>08.20 a.m. - 08.45 a.m.</p>	<p><u>Ralf Trapp</u><sup>1</sup> <i>1. Independent International Disarmament Consultant</i></p> <p>Recent decades have seen an increase in intent and capability of terrorist groups to use non-conventional means of terror and death. Chemical weapons are of particular concern given the comparatively low technological threshold to cross, and the relative ease of access to relevant chemicals.</p> <p>The 1997 Chemical Weapons Convention aims at eliminating State chemical weapons programmes and preventing any future acquisition of new chemical weapons. At the same time, it requires States Parties to enact and enforce penal legislation to ensure that toxic chemicals are not being acquired and used as chemical weapons by anyone coming under their jurisdiction. Since September 11, 2001, the OPCW has been discussing its contribution to the international fight against terrorism, and today provides a platform for discussing issues related to non-State actors including terrorists.</p> <p>There also has been a proposal for a separate international convention against chemical as well as biological terrorism. Furthermore, the employment of “asphyxiating, poisonous or other gases, and all analogous liquids, materials or devices” was included among the serious violations of the laws and customs of armed conflict of the ICC’s Rome Statutes. Finally, with respect to Syria, a mechanism (the IIIM) has been set up to assist in the investigation and prosecution of the most serious crimes under International Law committed in Syria, including cases of chemical weapons use.</p> <p>Nevertheless, there remain weaknesses in international criminal law as it applies to the use of chemical weapons by terrorists. This paper argues that certain additional agreements or arrangements are needed to respond effectively to these threats. However, any such additional agreement and arrangements must be anchored firmly within the legal norms and definitions of the CWC in order to avoid legal uncertainties that could otherwise undermine the norm against chemical weapons use.</p>
<p><b>T.6-D.2-O.2</b></p>	<p><b>SMALL SATELLITES CONSTELLATIONS AND THEIR IMPACT ON CBRNE MANAGEMENT IN AFRICA</b></p>
<p>08.45 a.m. - 09.10 a.m.</p>	<p><u>Donato Morea</u><sup>1</sup>, <u>Giacomo Primo Sciortino</u><sup>2,3</sup> <i>1. Faculty of Economics, Universitas Mercatorum, Rome, Italy.</i> <i>2. Pegaso University, Naples, Italy.</i> <i>3. Shortman Consultants, Rome, Italy.</i></p> <p>A wave of small satellites constellations is progressively populating the LEO (Low Earth Orbit) with a low - cost, and varied, offer of TLC (speed band) and Earth Imaging services (Huawei, Spacelink, Planet, One Web, etc.). These programmes, triggered by the latest technologies of satellite interlocking communication, dramatically cut the costs of launch and orbit flight management and therefore challenge the paradigm of traditional, heavy and expensive geostationary satellites operating at high altitudes. They are in most cases commercially financed and support the launch of large numbers of units (several hundreds and more for each constellation). This new entry in the panorama of space applications, declined in the field of Homeland safety and security, is likely to create new markets especially in the developing world, where such services are scarce, not consolidated or even missing. The geographical focus of this study is Africa and it deals not only with Institutional PRS users but to a wider context</p>

**TECHNICAL TABLE 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science**

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	<p>(Corporations, Private users). The authors, based on a plan of services and relative pricing connected to a model constellation of small - and therefore debris risk safe - microsatellites, presented already at several IAF (International Astronautical Federation) Symposia on Space Economy, simulate the type of services available (TLC band types, upload and download rates, radar – daylight imaging, refresh rates and resolutions, signal backhauling systems, user and mobile terminals, etc.) with their relative pricing fitting them to specific Country cases and situations (eg oil infrastructure sabotage in Niger Delta). The study concludes analysing some Country context gaps (educational, legal, political) that need to be filled to implement the space applications to larger audiences in the developing World. Relative positive cases are reported such as Egypt, Nigeria, Ghana, South Africa.</p>
<b>T.6-D.2-O.3</b>	<b>NEW FRONTIER OF AIRBORNE REAL-TIME MONITORING OF VOLATILE COMPOUNDS</b>
09.10 a.m. - 09.35 a.m.	<p>Gaetano Carminati<sup>1</sup>, Brais Vazquez Iglesias<sup>2</sup>  <sup>1</sup> Head of Technical Operational Unit, Ministry of Foreign Affairs and International Cooperation, Direction of Politics and Security General Affairs, Italian National Authority for the implementation of the Chemical Weapons Convention  <sup>2</sup> Pollution srl.</p> <p>Air pollutants represent a major public health concern; thus, a precise and real-time analysis is required in order to monitor the air quality and implement corrective measures. Gas chromatography is the most sensitive and reliable analytical technique used nowadays in this field, and PyxisGC is a new, innovative, portable analyzer, which will expand the application and potential of air monitoring.</p> <p>Miniaturization is at the core of technological innovation, and is made possible by Micro Electro-Mechanical Systems (MEMS). MEMS based pre-concentrator and chromatographic column means a smaller size and weight of the analyzer, smaller pumps, lower energy consumption and faster analytical cycles. The other key feature of PyxisGC is the absence of a carrier-gas cylinder; instead filtered ambient air is used to flush the volatile compounds through the separation column.</p> <p>All these advantages open up new ways to monitor air pollutants for example with the use of the unmanned Aerial Vehicle, where is not feasible the use with the bulky rack-mounting gas-chromatographs. The new approach of use PyxisGC installed below a drone give the possibility to have a real-time monitoring of BTEX carried out at different heights with different metrological conditions, giving a clearer picture of air quality in the desired area.</p>
<b>T.6-D.2-O.4</b>	<b>LEAN THINKING APPROACH IN CRISIS SCENARIOS: MANAGING A CBRNE EMERGENCY IN A LAW ENFORCEMENT DEPARTMENT BY MEANS OF MANAGERIAL DECISION-MAKING TOOLS</b>
09.35 a.m. - 10.00 a.m.	<p>Claudio Guidotti<sup>1</sup> ; Damiano Ricci<sup>2</sup>  <sup>1</sup> Central Anticrime Directorate of Italian Police, Forensic Science Police Service, Regional Forensic Unit "Toscana", Firenze, Italy.  <sup>2</sup> Central Anticrime Directorate of Italian Police, Forensic Science Police Service, Rome, Italy.</p>

**TECHNICAL TABLE 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science**

Chairpersons: Dr. Ralf Trapp, Cpt.Hojun Kwon and Prof. Donato Morea  
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	<p>The ongoing developments in security and public order threats, which include worldwide menaces, requires a thorough evaluation of the methods currently used to prevent and address crisis situations, particularly as it relates to non-conventional CBRNe (chemical, biological, radiological, nuclear and explosive) events. The ability to respond quickly and effectively to an unusual scenario such as those following the propagation of COVID-19 requires a deeper awareness not only of the risks associated with CBRNe challenges, but also of the display of management resources and know-how in order to resolve the various phases of the emergency, such as: understand and evaluate the magnitude and type of the threats, effective communication, mitigate the impact of adverse events that cannot be avoided, monitor the situation and the resources depletion.</p> <p>For a CBRN advisor it is imperative to be able to assess the effect of a CBRN scenario in any given context, in order to provide with the best recommendations in order to take favourable paths during the crisis phase.</p> <p>In this report, it was methodically explored, from the CBRN awareness point of view, a structured successful response to the emergency management of the Regional Forensic Police Centre of Firenze (Italy). The authors decided to manage the unexpected emergency situation within their own offices, using a wide range of instruments often related solely to the private business dimension, such as "Lean thinking approach", the SWOT analysis, the KPI research, in order to exit the crisis phase mitigating the expected damages, and assessing how a strategic approach can help to exit more quickly from a phase of external turbulent change.</p>
<p><b>T.6-D.2-O.5</b></p>	<p><b>INTRODUCTION OF COUNTER TERRORISM SYSTEM IN REPUBLIC OF KOREA: THE ONLY DIVIDED COUNTRY IN THE WORLD</b></p>
<p>10.00 a.m. - 10.25 a.m.</p>	<p><u>Hojun Kwon</u><sup>1,2</sup>  <i>1. Captain of Republic of Korea Army</i>  <i>2. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></p> <p>The Korean peninsula was divided in 1953 at the end of the Korean War. Until now, Korea is left as the one and only divided country in the world. South Korea has tried to take a forward when it comes to the relationship with North Korea. But, at the same time, as N.K committed provocations such as 'assassination of Kim Jung-nam' and 'several nuclear tests', South Korea has also tried to be prepared to deal with the N.K's increasing military capabilities of chemical, biological, radiological and nuclear weapons and the possibility of provocation with them. Unstable and unpredictable situations in the regime of N.K also force South Korea to remain extremely prepared to prevent any disastrous developments, including military conflicts.</p> <p>Moreover, Terrorist attacks are happening all around the world these days. South Korea is no longer safe from terrorist attacks as international terrorist groups are making threats of terrorism to our public. Therefore, to protect the life and property of our citizens and secure the national and public safety, Government established National Counter-Terrorism Center in 2016.</p> <p>Along with this change, R.O.K(Republic of Korea) is always trying to maintain the immediate response system. With this presentation, I will explain the counter terrorism system of R.O.K and I hope this will provide you some information that make you reconsider and understand the diversity of CBRN counter-terrorism framework.</p>
<p><b>T.6-D.2-O.6</b></p>	<p><b>ITALIAN MILITARY CBRN EDUCATIONAL AND TRAINING CAPABILITIES</b></p>
<p>10.25 a.m. - 10.50 a.m.</p>	<p><u>Giampaolo Santini</u><sup>3</sup>  <i>1. Maj. NBC School of Rieti, Italian Ministry of Defence (Italy)</i></p> <p>Italian military CBRN educational and training capabilities</p>



**TECHNICAL TABLE 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science**

Chairpersons: Dr. Ralf Trapp, Cpt.Hojun Kwon and Prof. Donato Morea  
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<b>T.6-D.2-O.7</b>	<b>PREPAREDNESS AND RESPONSE FOR A NUCLEAR OR RADIOLOGICAL EMERGENCY: ANALYSIS OF IAEA'S SAFETY REQUIREMENTS AND GUIDES</b>
10.50 a.m. - 11.15 a.m.	<p>Andrea Micozzi<sup>1</sup></p> <p><i>1. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy</i></p> <p>The main objective of the thesis topic is to analyze and summarize the IAEA's requirements and safety guide concerning preparedness and response for a nuclear or radiological emergency, in order to advise the decision maker for the correct procedures to follow for the assessment and management the emergency arising from the release of radioactive material or substances. This concern a quickly review of the arrangements listed in IAEA's Safety Requirements and Safety Guide, with reference about the developments of the actions undertaken by operator or operating organizations to manage the nuclear or radiological emergency, assessing the generic criteria, operational criteria and dose limits that are needed to determine the emergency class and the definition of the prerequisites and the arrangements to terminate the emergency.</p>
<b>T.6-D.2-O.8</b>	<b>CBRNE VETERINARY: ANIMAL MANAGEMENT IN DISASTER</b>
11.15 a.m. - 11.40 a.m.	<p>Luca Zelinotti<sup>1</sup>, Marco Serale<sup>2</sup>, Botti Lorenzo<sup>3</sup>, Cardamone Rocco<sup>4</sup>, Petrelli Guido<sup>5</sup>, Francesco Geri<sup>6</sup>, Leonardi Marco<sup>7</sup>, Terzilli Dania<sup>8</sup>, Vinci Antonio<sup>9</sup>, Monti Manuel<sup>10</sup>, Rosiello Francesco<sup>11</sup></p> <p><i>1. Emergency Management</i>  <i>2. ASL Cuneo 1</i>  <i>3. Vigili del Fuoco</i>  <i>4. Polizia di Stato</i>  <i>5. Italian military Red Cross</i>  <i>6. Protezione civile</i>  <i>7. Protezione civile</i>  <i>8. Independent</i>  <i>9. Università degli Studi di Roma "Tor Vergata"</i>  <i>10. USL Umbria 1</i>  <i>11. Sapienza University of Rome</i></p> <p>Purpose: Provide an assessment of the state of the art and technical-scientific solutions to the Civil Protection Department and other agencies to guarantee the health and safety at work of the operators employed in the management of animals (and working dog ) and specific courses/training for these activities. Provide ancillary tools to ensure animal health and wellness and public health</p> <p>Background: Operators and Civil Protection Volunteers (VPCs) are employed in extremely various scenarios from natural disaster to industrial accident to CBRNe. Today there aren't PC operators high specialized in animal management/rescue, there are no specific courses in according to Law (D.Lgs 81/08) or specific training for these activities also for veterinarians. Contamination problems are known and poorly managed, in particular asbestos risk, and there are no management tools, animal decontamination and operators trained in the event of a CBRNe veterinary event.</p> <p>Method and materials: Study and analysis of rescue operations in Italy. Analysis of procedures and protocols of agencies, institutions and auxiliary and voluntary organizations (Civil Protection) on events involving hazardous materials (Hazmat).</p> <p>Finding: The cases analyzed and the absence of inter-force procedures make it clear that Civil Protection (and dog handler) volunteers are highly exposed to the risks of hazardous substances (Hazmat), C.B.R.N.e. and terrorism.</p> <p>Conclusions: We urgently need to plan a response and train suitable staff to mitigate the enormous risks for Civil Protection volunteers, allow the rescue of animals safely and to reduce losses in a disaster or a CBRN event.</p>

**TECHNICAL TABLE 6. CBRNe-related geopolitical issues, Safety and security Legal and Economic aspects, New frontiers of science**

Chairpersons: Dr. Ralf Trapp, Cpt.Hojun Kwon and Prof. Donato Morea  
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<b>T.6-D.2-O.9</b>	<b>THE TEAM LEADER'S DECISION - BETWEEN THE LAW AND OPERATIONAL REQUIREMENTS</b>
11.40 a.m. - 12.05 a.m.	<p><u>Carol Peterfi</u><sup>1</sup> <i>1. OPCW Organization for the Prohibition of the Chemical Weapons (OPCW), The Hague, (NETHERLANDS)</i></p> <p>I will speak about my experience as ITL during a mission for taking over some CWA samples. The mission took place in a very fluid environment, and although it looked simple, some restrains and constrains related with the interest of the stakeholders, complicated it and requested ITL to took decisions which are usually made by higher management.</p> <p>The speech will shortly describe the mission objectives, and how those have been achieved in spite of the difficulties created by the miscommunication, wrong understanding of the operational environment, and lack of cooperation among UN entities operating in the same operational area, and how those difficulties were overcome by the team who smartly and ingeniously applied the existing SOPs and WIs (Working Instructions).</p> <p>The speech will also underline some lessons learnt from the mission and how those had been introduced into the OPCW procedures and training.</p>
<b>T.6-D.2-O.10</b>	<b>THE ITALIAN AIR FORCE OPERATIONAL LOGISTICS AT THE TIME OF COVID-19</b>
12.05 a.m. - 12.30 a.m.	<p><u>Luongo Giovanni</u><sup>1</sup> <i>1. Colonel, Commander 3rd Wing Italian Air Force, Villafranca di Verona, Via Caluri (Verona), Italy</i></p> <p>The Italian Air Force was involved in the current global pandemic already two weeks before the COVID-19 was named so by the WHO. In fact the first operation was on January 28, with the air transportation of the first infected compatriots from Wuhan. Since then, the 3rd Wing continued on being involved in a wide spectrum of logistics challenges. From the decontamination of aircrafts, assets and personnel, through its CBRN/Decon Teams, to the mounting of field Hospitals in Cremona and in the Province of Padua. From the installation of drive through testing stations to the establishment of Medical Advanced Post in support of the civilian health care system. The recent and current employment of the Air Force Operational logistics shows clearly how the military logistics is a key partner to the Country in terms of preparedness, readiness and effectiveness. A resilient military logistics for a resilient Country system</p>
<b>T.6-D.2-O.11</b>	<b>COVID-19 PANDEMIC. THE ITALIAN AIR FORCE PERSPECTIVE</b>
12.30 a.m. - 12.55 a.m.	<p><u>Alberto Autore</u><sup>1</sup> <i>1.Colonel, Commander of Air Base Clinic, Pratica di Mare Airport, Via Pratica di Mare, Pomezia (Roma), Italy</i></p> <p>COVID-19 PANDEMIC. The Italian Air Force Perspective</p>

**DAY 3**  
**12 December 2020**

**PLENARY SESSION 1.**

Chairpersons: Dr. Michael Ian Thornton, Dr. Andrea Malizia  
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**PLENARY SESSION 1. [12 December 2020, 08.30 a.m. - 12.50 p.m. (UTC+1 - Italian Time), Virtual Room: AUDITORIUM]**

08.30 a.m. - 09.00 a.m.	<b>Opening Welcome</b>
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<b>Prof. Orazio Schillaci</b>	<i>Rector of the University of Rome Tor Vergata (Italy)</i>
<b>Prof. Loredana Santo</b>	<i>Director of the Department of Industrial Engineering, University of Rome Tor Vergata (Italy)</i>
<b>Prof. Antonino De Lorenzo</b>	<i>Director of the Department of Biomedicine and Prevention, University of Rome Tor Vergata (Italy)</i>
<b>Prof. Pasquale Gaudio</b>	<i>Coordinator of the International Master Courses in Protection Against CBRNe events, University of Rome Tor Vergata (Italy)</i>

09.00 a.m. - 09.40 a.m.	<b>Oral Session</b>
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<b>P1.O1</b>	<b>Prof. Tony Hooker</b>	<b>EMERGENCY PREPAREDNESS AND RESPONSE TRAINING: A SOUTH AUSTRALIAN PERSPECTIVE</b>
09.00 a.m. - 09.20 a.m.	<i>Centre for Radiation Research, Education and Innovation University of Adelaide (AUSTRALIA)</i>	

Australia is a federation of six states and two self-governing territories, all with their own constitutions, parliaments, governments, and laws. The Australasian Inter-service Incident Management System (AIIMS) was developed in the 1980's to provide an "all hazards" command and control framework for use by emergency services across Australia. This approach includes mitigating and planning for emergencies resulting from natural events (eg bushfire, storms, and floods), cyber crimes and malicious intent (e.g. sabotage or terrorism). The framework consists of five major areas: Control, Planning, Public Information, Operations and Logistics.

First responders are generally highly trained within their professional areas. Whilst the all hazards approach works well from a command and control perspective, the complex and often technological nature of CBRNe events requires continuing education to deal with issues such as risk communication (first responders and members of the public), the use of different emergency equipment/technologies across jurisdictions as well as the need for gathering rapid intelligence with respect to terrorist events.

South Australia has arguably led the way in Australia with its yearly CBRNe training program and field exercises. This talk will describe the CBRNe training program, and some of its limitations. I will also outline how the Centre for Radiation Research, Education and Innovation (CRREI) is looking to establish national, continuing education short courses for CBRNe first responders and managers.

Examples from personal experiences/observations of radiation incidents, as well as the Australian bushfire crisis in 2019- 2020 will be discussed.

<b>P1.O2</b>	<b>Prof. Nakahiro Yasuda</b>	<b>A NEW EMERGENCY RESPONSE EDUCATION CURRICULUM: FROM THE EXPERIENCES AND LESSONS LEARNED FROM THE TEPCO FUKUSHIMA DAIICHI NUCLEAR POWER PLANT ACCIDENT</b>
09.20 a.m. - 09.40 a.m.	<i>The Research Institute of Nuclear Engineering University of Fukui (JAPAN)</i>	

The nuclear disaster prevention system in Japan has been improved in the wake of the accident after the TEPCO Fukushima Daiichi Nuclear Power Plant accident. Of these, the part related to education and training will be highlighted. Local governments play a central role, and the central government plays as a supporter in implementing disaster prevention measures in the Japanese law system. For this reason, there has been a nuclear disaster response curriculum for administrative staff who take measures, both in local and the central governments. In this curriculum, in the event of a nuclear disaster, from the perspective of protecting residents, students will learn

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the systems and rules for instructing indoor evacuation and evacuation through classroom lectures and desk exercises. In addition to this, an educational curriculum for radiation emergency medicine has been prepared that reflects the experiences and lessons learned from the accident. It consists of three courses: basic, applied, and dispatch team. If the accreditation committee recognizes that you have mastered the applied course, you will be able to teach in the basic course. The three courses are: 1) lectures and practical training on the basics, effects, and measurement of radiation, 2) lectures and practical training that doctors, nurses, and radiation management personnel who deal with at the base hospital should learn, 3) lectures and practical training that enable teams to be dispatched from outside to the site are composed of items to be learned. In particular, it is characterized by the fact that mental health is included in each stage, assuming the care of disaster victims who are afraid of radiation and the care of their supporters.

**09.40 a.m. - 12.00 a.m.**    **Round Table** - Presentation of the new cooperation agreements with the University of Rome Tor Vergata in the aim of the CBRNe activities: education, training and research

<b>LECTIO MAGISTRALIS</b>	<b>Prof. Dr. rer. nat. Thomas DEKORSY</b>	<b>LASER BASED CBE STAND-OFF DETECTION AND THE NEW COOPERATION OF GERMAN AEROSPACE CENTER (DLR) WITH THE UNIVERSITY OF ROME TOR VERGATA IN THE AIM OF CBRNE RESEARCH, DIDACTIC AND TRAINING</b>
09.40 a.m. - 10.10 a.m.	<i>Director of the Institute of Technical Physics German Aerospace Center (DLR) (GERMANY)</i>	

Prof. Dekorsy is heading the Institute of Technical Physics of the German Aerospace Center (DLR) since July 2016. He is also affiliated as professor at Stuttgart University in the Faculty for Aerospace Engineering and Geodesy and a member of the Stuttgart Research Center of Photonic Engineering (SCoPE). His scientific interest lies in the development of new laser systems in the area of aerospace, security and defense, and the education of young academics in these fields.

Dekorsy was born in Jülich, Germany, in 1965. He graduated in Physics at the RWTH Aachen in 1992. He received his Ph.D. from the RWTH Aachen in 1996 which was performed at the Institute of Semiconductor Electronics under the supervision of Prof. Dr. Heinrich Kurz. The subject of the Ph.D. was ultrafast processes in semiconductor quantum structures investigated by femtosecond lasers. A highlight of the thesis was the first observation of tunable electronic quantum coherence in semiconductor superlattices (Bloch oscillations) at room temperature. From 1997 until 2000 he was assistant professor (Oberingenieur) at the Institute of Semiconductor Electronics, where he headed research groups on laser development, time-resolved spectroscopy and self-organized formation of nanostructures. The discovery of a new process for the formation of self-organized nanostructures on large areas by ion-beam sputtering was awarded with the Bennisgen-Foerder Award of the state North-Rhine Westphalia in 2000. In 2001 he received the Gustav-Herz Award of the German Physical Society for the investigation of quantum coherence in semiconductors. In 1999 he co-founded Gigaoptics GmbH. Gigaoptics (now Laser Quantum GmbH) provides femtosecond laser at GHz repetition rates which e.g. were employed in Prof. Theodor Hänsch's Nobel price winning experiment on frequency combs.

From 2000 to 2004 Dekorsy was division head at the Helmholtz Research Center Dresden-Rossendorf (HZDR). He headed the spectroscopy division within the Institute of Ion Beam Physics and Materials Research (Director Prof. Manfred Helm). Here he built up spectroscopy laboratories for the free-electron laser FELBE, performed work on electrical driven light emission from silicon dioxide, efficient large area Terahertz emitters, and quantum cascade lasers. The invention of a large area scalable Terahertz emitter (TERA-SED) was awarded with the technology award of the HZDR in 2006.

From 2004 to 2016 Dekorsy was full professor the Konstanz University. He was deputy director of the Center of Applied Photonics (CAP). His group developed new laser sources and applications of these lasers in spectroscopy. He developed the method of high-speed asynchronous optical sampling (high-speed ASOPS) with coupled femtosecond lasers at GHz repetition rates, a time-domain analogue of dual-comb spectroscopy. A new class of large area Terahertz emitters based on the photo-Dember effect was invented. In cooperation with Trumpf Laser ultrafast thin-disk oscillators with high average power were realized based on the concept of an active multi-pass cell. Dekorsy was Dean of Studies (transformation of the Diploma system to Bachelors/Master system) and Dean. In 2011 he received the award of the University Council for the project "Schülerinnen forschen" which included

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organization of science camps at Lake Constance for girls aged 13-16. In 2016 he received the award of the Student Council Physics for excellent teaching. In 2019 he was elected as Fellow of the Optical Society of America. Dekorsy is member of several program committees of international conferences and summer schools, among them CLEO-Europe, Laser Applications Conference (LAC), and Son et Lumière. He co-authored more than 250 publications, holds 6 patents, and gave more than 50 invited talks at international conferences in the fields of laser technology, femtosecond spectroscopy and Terahertz science. Many publications are based on international cooperation with scientists from France, Spain, UK, Switzerland, Finland, Norway, the Netherlands, USA, South Korea, Canada, Russia, China, Argentina, Brazil, and Japan. He is member of scientific committees and review panels at the Helmholtz Center Dresden-Rossendorf, DESY/XFEL Hamburg and the Leibniz Society. He is member of the professional societies DPG, DGaO, EOS, OSA (Senior Member Recognition 2013), DGLR, DWT and DHV. He is referee for Optica, Optics Letters, JOSa B, Applied Optics, Physical Review Letters, Physical Review B, Applied Physics Letter, Journal of Applied Physics, Applied Physics B, Nature, Science, Nature Photonics, Nature Materials and received the recognition as Outstanding Reviewer from the Optical Society of America in 2016.

<b>P1.04</b>	<b>Lt.Col. Tiago Manuel Batista Lopes</b>	<b>THE FIRST RESPONDERS ROLES DURING NATIONAL AND INTERNATIONAL CBRNE EMERGENCIES</b>
10.10 a.m. - 10.30 a.m.	<i>Commander of the Firefighters Regiment of Lisbon Regimento De Sapadores Bombeiros (PORTUGAL)</i>	

<b>P1.05</b>	<b>Sen. Vincenzo D'Anna</b>	<b>BIO-THREATS AND RISKS RELATED TO BIO-CONTAMINATION: AN ALL HAZARDS APPROACH TO IMPROVE THE SAFETY FACTORS</b>
10.30 a.m. - 10.40 a.m.	<i>President of National Order of Biologist (ITALY)</i>	

10.40 a.m. - 10.50 a.m.

**BREAK**

<b>P1.06</b>	<b>Dr. Ramon De La Vega</b>	<b>IAEA GUIDANCE ON RADIOLOGICAL AND NUCLEAR EMERGENCIES IRRESPECTIVE OF ITS CAUSE, SAFETY OR SECURITY RELATED. CURRENT CHALLENGES AND WAY FORWARD</b>
10.50 a.m. - 11.10 a.m.	<i>International Atomic Energy Agency (IAEA) Vienna International Centre, Vienna (AUSTRIA)</i>	

According to its mandate, the IAEA provides support to Member States in the use of peaceful applications of nuclear technologies to support societal and economic development. One of the duties to deliver this mandate is the development of Safety Standards that sets reference for achieving high level of safety in the use of nuclear technologies. Emergency Preparedness for and Response (EPR) to nuclear or radiological emergencies is aimed at ensuring adequate protection to the public and the environment when preventive measures in the use of nuclear technologies have failed, either owing to equipment failure, human error, natural disaster or malevolent acts. The IAEA published in 2015 the General Safety Requirements Part 7: Emergency Preparedness and Response, which sets the requirements to be met for ensuring appropriate preparedness for and response to nuclear or radiological emergencies. Further guidance on how to implement these requirements is provided in different IAEA Safety Guides and other publications (EPR Series).

In this paper, a summary will be provided on the main aspects of IAEA guidance on EPR, the different activities to provide support its use by IAEA Member States based on them and the challenges faced to ensure appropriate response to nuclear or radiological emergencies, irrespective of its cause either safety or security related based on the latest experiences and developments.

- IAEA's guidance is based on a hierarchical structure, made of Safety Fundamentals, Requirements, Safety Guides and Technical Guidance Publications.
- In addition to production of this guidance, the IAEA provides services to support Member States in strengthening their EPR arrangements: delivery of capacity building activities (including delivery of

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different capacity building activities such as training and support to educational activities in EPR) and provision of peer review services upon request.

- The most relevant challenges faced in the EPR field based on recent experiences

<b>P1.07</b>	<b>Dr. Colomba Russo</b>	<b>THE ROLE OF HESAR IN THE CBRNe - INTERNATIONAL MASTER COURSES IN PROTECTION AGAINST CBRNe EVENTS</b>
11.20 a.m. - 11.35 a.m.	<i>HESAR Association, CBRNe Master Courses (University of Rome Tor Vergata) (ITALY)</i>	

<b>P1.08</b>	<b>Dr. Michael Ian Thornton</b>	<b>TABLE TOP EXERCISES: THE EMERGENCY SIMULATIONS TO IMPROVE THE LEVEL OF EXPERTISE FOR THE CBRNe OPERATORS</b>
11.20 a.m. - 11.35 a.m.	<i>INAC Association (ITALY)</i>	

<b>P1.09</b>	<b>Prof. Amer Hosin</b>	<b>THE LINK BETWEEN ABU DHABI POLICE AND THE UNIVERSITY OF ROME TOR VERGATA FOR THE MAXI-EMERGENCIES EDUCATION, TRAINING AND RESEARCH</b>
11.35 a.m. - 11.55 a.m.	<i>Abu Dhabi Civil Defence Authority, Abu Dhabi (UNITED ARAB EMIRATES)</i>	

<b>11.55 a.m. - 12.40 p.m.</b>	<b>Oral Session</b>

<b>P1.010</b>	<b>BMD spa</b>	<b>BMD SPA - NEW TECHNOLOGIES FOR CBRNe DETECTION and IDENTIFICATION</b>
12.00 p.m. - 12.30 p.m.	<i>PLATINUM Sponsor</i>	

<b>P1.011</b>	<b>WL GORE &amp; ASSOCIATI</b>	<b>WL GORE &amp; ASSOCIATI - NEW TECHNOLOGIES FOR INDIVIDUAL CBRNe PROTECTION</b>
12.30 p.m. - 12.50 p.m.	<i>Gold Sponsor</i>	

**PLENARY SESSION 2.**

Chairpersons: Dr. Dieter Rothbacher, Dr. Andrea Malizia  
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**PLENARY SESSION 2. [12 December 2020, 01.50 p.m. - 03.50 p.m. (UTC+1 - Italian Time), Virtual Room: AUDITORIUM]**

01.50 p.m. - 03.50 p.m.		<b>Oral Session</b>
<b>P2.O1</b>	<b>Dr. Sergei Zinoviev</b>	<b>CAPACITY BUILDING PROGRAMMES OF THE INTERNATIONAL COOPERATION BRANCH AIMING AT PROMOTING THE PEACEFUL USES OF CHEMISTRY AND ENSURING CHEMICAL SAFETY AND SECURITY IN THE FRAMEWORK OF THE IMPLEMENTATION OF ART XI OF THE CONVENTION</b>
01.50 p.m. - 02.20 p.m.	<i>International Cooperation Branch Organization for the Prohibition of the Chemical Weapons (OPCW) (NETHERLANDS)</i>	

<b>P2.O2</b>	<b>Prof. Leonardo Palombi</b>	<b>GLOBALIZATION, EPIDEMICS and SECURITY</b>
02.20 p.m. - 02.40 p.m.	<i>Department of Biomedicine and Prevention University of Rome Tor Vergata (ITALY)</i>	

<b>LECTIO MAGISTRALIS</b>	<b>Prof. Rick FONTANA</b>	<b>ON THE GROUND 9/11, THE RESPONSE &amp; RECOVERY AT GROUND ZERO</b>
02.40 p.m. - 03.10 p.m.	<i>Director at the City of New Haven Office of Emergency Management &amp; Homeland Security (USA)</i>	

**BIO**

Richard 'Rick' Fontana, Jr. Director at the City of New Haven, Office of Emergency Management & Homeland Security where he has been for the past 12 years. He retired from the West Haven Fire Department after spending over 30 years as a Career Firefighter / Paramedic. Mr. Fontana earned his Fire Science Administration Degree from the University of New Haven and went on to earn a Master's Degree in National Security and Public Safety also from the University of New Haven. Mr. Fontana is appointed to serve on the FEMA Region 1 Regional Advisory Committee with the states of CT, MA, RI, ME, NH, and VT. Additionally, Mr. Fontana is an Adjunct Professor at the University of New Haven, and newly appointed Board Member for Cyber Security at the University of New Haven and is Governor appointed Fire Commissioner for the CT Commission on Fire Prevention and Control.

**ABSTRACT**

In the 2 days following the 9/11 attack on the World Trade Center, Mr. Fontana responded directly to Ground Zero in New York City with a team of firefighting personnel. Working together with personnel from FDNY and many other departments, Mr. Fontana worked the "Pile" as search and rescue team member of the World's most gruesome attack on American freedom. "We must never forget those 2977 souls of which were 343 firefighters, and 71 Law Enforcement Officers". More than 6000 were injured in the terrorist attack of the largest explosive device designed to kill innocent people. Mr. Fontana will provide his personal experience at Ground Zero and discuss details of the Response and Recovery.

<b>P2.O3</b>	<b>Prof. Francesco d'Errico</b>	<b>TRENDS AND TRAINING IN NUCLEAR SAFETY AND SECURITY</b>
03.10 p.m. - 03.30 p.m.	<i>Department of Civil and Industrial Engineering University of Pisa (ITALY)</i>	



**PLENARY SESSION 2.**

Chairpersons: Dr. Dieter Rothbacher, Dr. Andrea Malizia  
DAY 3 - 12 December 2020

<b>P2.O4</b>	<b>Prof. Vasilis Vasiliou</b>	<b>EPIDEMICS, EMERGING AND RE-EMERGING DISEASE: THE IMPORTANCE OF INTERNATIONAL COOPERATION TO REDUCE RISKS</b>
03.30 p.m. - 03.50 p.m.	<i>Director of the Department of Environmental Health Sciences Yale School of Public Health, University of Yale (USA)</i>	

**POSTER SESSION 1.**

Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020

**POSTER SESSION 1. [12 December 2020, 04.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time),  
Virtual Room: AUDITORIUM]**

**PO.1.1**

**THE INFECTIOUS DISEASES SEEKER (IDS): AN INNOVATIVE TOOL FOR PROMPT IDENTIFICATION OF INFECTIOUS DISEASES DURING OUTBREAKS**

Federico Baldassi<sup>1</sup>, O. Cenciarelli<sup>2</sup>, A. Malizia<sup>3</sup>, P. Gaudio<sup>3</sup>

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*3. Department of Biomedicine and Prevention, University of Rome Tor Vergata*

Several technologies for the rapid molecular identification of pathogens are currently available; jointly with monitoring tools (i.e. web-based surveillance tools, infectious diseases modellers and epidemic intelligence methods), they represent important components for timely outbreak's detection and for the identification of the involved pathogen. The application of these approaches can be more effective when performed by staff with a scientific background or experience; contrariwise, in field situation when first responders from heterogeneous competences can be asked to investigate an outbreak of unknown origin, the use of a prompt, user-friendly and accessible tool able to rapidly and carefully recognize the infectious disease possibly involved in the epidemic, would be paramount to support the outbreak investigation. This poster presents the work performed to develop and implement the Infectious Diseases Seeker (IDS), a tool developed in the MATLAB® environment, built by integrating a database containing a interim set of 60 different disease causative agents, able to work in an off-line mode without requiring network connection.

**PO.1.2**

**CLIMATE CHANGES AND CBRN**

Saeed Bin Hadher<sup>1,2</sup>

*1. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy*

*2. Dubai Police, Search and Rescue Department, United Arab Emirates*

Developing CBRN equipments and methods in Middle East to deal with high temperatures and high humidity. There is an urgent need of new equipment and technologies because weather is a factor that greatly impacts of Chemical, Biological, Radiological, Nuclear and explosive material in many ways. Humidity, temperature, Wind and Rain are mean factors that takes into consideration when dealing with CBRN. The weather difference between the Middle East and Europe is significant, which creates big challenges for the CBRN first respond team to deal with incidents in the Middle East. Most of the companies developing these products are located in Europe and most companies produce detectors devices and personal protective clothing based on their region so it is necessary to have companies in middle east dealing and production equipment according to the regional situation, weather is a key factor. Produce CBRN equipment with special requirements to be fit with Middle East.

**PO.1.3**

**LOW COST BISTATIC LIDAR FOR FILTERING EFFICIENCY OF FACE MASKS EVALUATION**

Federico Angelini<sup>1</sup>, Valeria Spizzichino<sup>1</sup>

*1. ENEA*

A low-cost laser-based instrument for liquid droplet filtering capability of facial masks has been set and operated to detect the normalized number of particles passing through different kinds of filtering masks. A full-frame Single Lens Reflex was installed in a forward scattering geometry to capture the small angle red light from a solid-state laser diode (emitting at 650 nm) scattered from droplets emitted by an electric paint sprayer and crossing a face mask. The red channel of the pictures has been processed from the Nikon raw format with astrophotography software to ensure response linearity, and obtain the integrated scattering cross section of the cloud. A Mie scattering module has been employed to simulate the phase function for different particle radii and individuate a region of interest in the picture where the cross section is almost independent on the angle and build a calibration function to correlate the cross section to the mass. The results showed that almost all tested masks, except the single-layer jersey mask, transmitted less than 1% of the mass.

## POSTER SESSION 1.

Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020

PO.1.4

### A REVIEW OF SINGLE AND MULTI-HAZARD RISK ASSESSMENT APPROACHES FOR CRITICAL INFRASTRUCTURES PROTECTION

Alessandro Pasino<sup>1</sup>, Andrea Clematis<sup>1</sup>, Silvia De Angeli<sup>2</sup>, Umberto Battista<sup>2</sup>, Davide Ottonello<sup>2</sup>

1. CNR Imati

2. STAM s.r.l.

One of the greatest challenges in our society is represented by the protection of Critical Infrastructures (CIs) from man-made and natural disasters. To do so, single and multi-hazard risk assessment techniques have been developed. This work aims identifying and comparing current state-of-the-art methodologies on single and multi-hazard risk focusing on CIs.

Data collection is the preliminary step for Risk Assessment. The critical analysis of literature allows identifying two main scenarios for data availability: (i) information is abundant and objective (ii) there is shortage of information, which is the most common because of the lack of historical data, and data are mostly based on expert knowledge. In this last case, Bayesian approaches are often adopted to transform expert judgments in more objective information. Another critical step is represented by the analysis of the threats facing a CI, specifically if interaction mechanisms among them are considered. In many cases, events are independently considered. In other cases, correlation among events is modeled, usually developing a correlation matrix. Furthermore, many methodologies consider only natural or man-made hazards, while only a few addresses both of them. As core part of the review, different methodologies applied for risk evaluation are compared. State-of-the-art methodologies can be distinguished into: mathematical and statistical, which focus on Bayesian networks, logarithmic regression and fault-tree techniques; machine learning, such as neural networks, support vector machines and optimization methods; graphs and networks, formed from game theory and complex networks.

The critical comparison of different methodologies allowed evaluating the most effective and promising ones. Statistical and mathematical methods have been demonstrated to be effective only if there are many available data. On the other hand, machine learning approaches work well even if the data are less. Finally, the graph and network approaches tend to be the most flexible, able to adapt to every condition. Acknowledgements: This work has been supported by ""Programma Operativo"" POR-FSE Regione Liguria 2014-2020 under grant G-RISK - RLFO18ASSRIC/70/1

PO.1.5

### CYCLONE DETECTION AND FORECASTING USING DEEP NEURAL NETWORKS THROUGH SATELLITE DATA

Shweta Kumawat<sup>1</sup>, Tanveer Habib Sardar<sup>1</sup>

1. School of Engineering and Technology, Jain University, Bengaluru

Satellite imagery provides the initial data information in cyclone detection and forecasting. To mitigate the damages caused by cyclones, we have trained interpolation and data augmentation techniques for enhancing the temporal resolution and diversifications of characters in a specific dataset. Algorithm requires classical approaches during preprocessing steps. Using 14 distinct constraint optimization techniques on three optical flow methods estimations are tested here internally. A deep learning model is trained and tested within artificially densified and classified storm data for cyclone identification and locating the cyclone vortex giving minimum 90% accuracy. The work analyzes two remote sensing data consist of QuikSCAT wind satellite data and merged precipitation data from TRMM and other satellites for feature extraction. The result and analysis show that the methodology met the objective of the project.

PO.1.6

### COVID-19 AND SOCIAL MEDIA COMMUNICATION: WHAT LESSON CAN WE LEARN?

Parrilla Antonio<sup>1</sup>

1. Presidenza del Consiglio dei Ministri

**POSTER SESSION 1.**

*Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020*

The pandemic caused by the SARS-CoV-2 virus represents an extreme challenge for the CBRN world in all its aspects, not least that of communication.

It is in fact the first time that an emergency has such a long duration, an almost worldwide extension, such a strong impact on people's lifestyles. This made it necessary to make an enormous effort to communicate the behaviors to be followed, the news on the evolution of the epidemic, the initiatives implemented; reaching the final recipient has therefore become imperative. On the other hand, during the lockdown the time spent on social media increased dramatically, making this tool, together with television, the main source of information. A source that, as countless studies have widely explained, is very often poisoned by fake news, conspiracy theories, attempts at disinformation or, much more simply, ineffective if the language used is not suitable for communicating with a specific type of recipient.

The purpose of this article is therefore to study how the institutional structures called to manage the emergency have used social media, what mistakes have been made, what information needs have not been met, what lessons can be learned for the future. All of this, of course, with a view to continuous improvement, proposing solutions, if possible, to achieve increasingly efficient communication even on these new channels.

PO.1.7

**COMMUNICATION IN THE ERA OF SOCIAL MEDIA: HOW TO WRITE A COMMUNICATION PLAN FOR EMERGENCIES**

Parrilla Antonio<sup>1</sup>

*1. Presidenza del Consiglio dei Ministri*

Disintermediation, the Dunning-kruger effect, the Overton window, polarization, cognitive bias, fake news and conspiracy theories are phenomena that strongly characterize communication via social networks, imposing a change in strategies, methods and tools that a good communicator must use to correctly convey his message. This happens because the competition has increased exponentially: the sources of information are no longer the classic ones, and the phenomenon of citizen journalism has allowed each user to become a reporter and to reach potentially the same large audience as that of a Pulitzer Prize or a Nobel Prize-winning Scientist. In emergency situations, during which incorrect information can have the effect of increasing damages, victims and making field operations more complicated, it is necessary to be prepared to face this new scenario, avoiding the risks connected to it and simultaneously exploiting their potential in order to strengthen the role of official communicators. In this document, the various elements that come into play will be summarized and illustrated and a strategy will be proposed for the preparation of an emergency communication plan designed considering all the new variables involved.

PO.1.8

**CRISIS COMMUNICATION AND CBRN TERRORISM: DEVELOPMENT OF A TRAINING CURRICULUM FOR COMMUNICATION EXPERTS AND CBRN ADVISORS**

Saman Choudary<sup>1</sup>, Ahmed Gamal Ibrahim<sup>1</sup>, Muhammad Usman Asghar<sup>2</sup>

*1. International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy*

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## POSTER SESSION 1.

Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020

Crisis communication is one of the key components of CBRN events management and the successful management of a CBRN event can only be assured, if effective crisis communication mechanisms are in place, addressing the demanding and complex circumstances being created by a CBRN crisis. A CBRN crisis presents unique environment and challenges for communication, which requires a specialized communication response, based on well-tailored education and training of communication experts and CBRN advisors. This calls for development of a collective and comprehensive approach towards crisis communication designed in a robust curriculum based on theory and methodology that could be used to train communication experts and CBRN advisors. However, in practice, there is no harmonized curriculum or methodology that could be used to train communication experts and CBRN advisors collectively as literature is enriched with research studies addressing different aspects of crisis communication but lack in the field training based on a comprehensive curriculum providing benchmark guidelines for communication experts. Therefore, this paper is aimed at defining the needs for CBRN communication and developing a CBRN training curriculum for communication experts and CBRN advisors. The designed curriculum will contribute to the sufficient communication training of communication experts and advisors, leading to development of extensive communication competencies and skills. The training curriculum could also be used for the improved public communication training of first responders, who also directly interact with public during CBRN emergency response operations.

PO.1.9

### CLASSIFICATION OF THE CURRENT STANDARD FRAGMENTATION CAPTURE MATERIAL, AND ITS COMPARISON TO ECONOMICAL ALTERNATIVES

Thomas Ritchie<sup>1</sup>, Richard Critchley<sup>1</sup>, Rachael Hazael<sup>1,2</sup>, David Wood<sup>1</sup>, David Miller<sup>1</sup>, Andrew Roberts<sup>1</sup>, Steve Johnson<sup>3</sup>

1. Centre for Defence Engineering, Cranfield University, Defence Academy of the United Kingdom, Shrivenham, SN6 8LA

When conducting live fire testing of any explosive ordnance, there is a requirement to measure the resulting fragmentation Kinetic Energy Density (KED) in order to classify the lethality of the fragmentation. This is achieved by detonating the complete item of ordnance and the capturing a proportion of the fragmentation in a suitable material. This allows the recovery of the fragmentation and the estimation of its initial velocity by its penetration of the capture material. The KED can be calculated from this information.

The current UK standard fragmentation capture material is known as strawboard and it is both expensive and limited in its availability. In this study strawboard was classified and compared against two economical alternatives, Medium Density Fibreboard (MDF) and floor underlay. It was found that the uniformity of response of the MDF was better than that of strawboard and identified the constants for both alternative materials in the McMahon equation for calculation of a spherical fragment strike velocity from penetration. Furthermore, it has been shown that strawboard can be replaced by a cheaper alternative with an increase in performance, while strawboard may now be unsuitable as a standard, which casts doubt on experimentation and processes where it has been assumed as such.

PO.1.10

### EVALUATION OF THE SPATIO TEMPORAL EPIDEMIOLOGICAL MODELER (STEM) DURING THE RECENT COVID-19 PANDEMIC

F. Baldassi<sup>1,2</sup>, F. D'Amico<sup>2</sup>, A. Malizia<sup>3</sup> and P. Gaudio<sup>1,2</sup>

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## POSTER SESSION 1.

Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020

In early December 2019 some people in China were diagnosed with an unknown pneumonia in Wuhan, in the Hubei province. The responsible of the outbreak was identified in a novel human-infecting Coronavirus which differs both from severe acute respiratory syndrome coronavirus (SARS-CoV) and from Middle East respiratory syndrome coronavirus (MERS-CoV). The new Coronavirus, officially named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses, has spread worldwide within few weeks. No vaccine is currently available and effective treatments have not been yet identified or developed even if some potential molecules are under investigation. The only method that contribute to reduce the virus spreading is the adoption of social distancing measures, like quarantine and isolation. With the intention of better managing emergencies like this, which are a great public health threat, it is important to dispose of predictive epidemiological tools that can help to understand both the virus spreading in terms of people infected, dead and recovered and the effectiveness of containment measures. In this study, we apply the Spatio Temporal Epidemiological Modeler (STEM) to evaluate if this predictive epidemiological tool could be useful to the decision makers in order to understand the potential impact of the epidemic on human being and reduce its consequent effects.

PO.1.11

### THE EXPERIMENTAL NEUTRON CROSS SECTION OF BARITE-ENRICHED CONCRETE IN THE ENERGY RANGE 1 MEV - 1 KeV

Marco Martellucci<sup>1</sup>, Giovanni Romanelli<sup>2</sup>, Silvio Valeri<sup>1</sup>, Danilo Cottone<sup>3</sup>, and Roberto Senesi<sup>4</sup>

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<sup>4</sup> Dipartimento di Fisica and NAST Centre, Universita' degli Studi di Roma "Tor Vergata", 00133 Roma, Italy

Heavy concrete for radiation shielding is obtained by making use of heavy natural aggregates such as barites or magnetite in the mixing process. Barite-containing concrete is mostly used for installations at diagnostic and medical-therapy facilities with mixed gamma and neutron ionising radiations in the MeV energy range. The weight/concentration ratio of Barite-containing concrete needs to be tuned so as to determine the optimal shielding properties as well as structural performance. While a number of experiments and calculations have characterised these materials for MeV-energy neutrons, little information is available at lower neutron energies.

Here, we present a neutron investigation of the spectroscopic and structural properties at the atomic scale of a series of barite-enriched concrete samples. In particular, neutron transmission measurements provide the macroscopic cross section (also known as neutron removal cross section) as a function of the incident neutron energy in the range 1 meV - 1 keV. In this range, the cross section is dominated by the scattering events from hydrogen, as opposed to the fast-neutron region where capture events by Ba are more important. For each sample, the effective amount of barium and hydrogen are provided by prompt-gamma activation analysis and deep inelastic neutron scattering, respectively.

We find that the amount of barium and hydrogen are correlated, with a lower amount of hydrogen in the samples with more barium. Moreover, we quantify the substantial contribution to the neutron macroscopic cross section from loosely-bound water molecules, that makes the shielding performance of concrete dependent upon the humidity and temperature conditions affecting the installation. Our results provide additional guidelines for radioprotection workers to determine the optimal concentration of barite in mixed gamma/neutron radiation environments.

PO.1.12

### EVALUATION OF THE TECNOMUSE MUON TOMOGRAPHY SCANNER IN A REAL SCENARIO

Enrico Preziosi<sup>1</sup>, Claudio Fornaro<sup>3</sup>, Claudia Scatigno<sup>4</sup>, Laura Fazi<sup>1</sup>, Anna Prioriello<sup>2</sup>, Valerio Scacco<sup>2</sup>, Roberto Senesi<sup>1</sup> and Alessandro Cianchi<sup>1</sup>

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**POSTER SESSION 1.**

Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020

Muon tomography is very promising imaging technique for the control of cargo containers. It takes advantage of cosmic particles to reconstruct tomographic images of the contents of the containers. In the present work, the imaging capabilities and the scalability in a real scenario of the prototypical TECNOMUSE muon tomography scanner are evaluated by means of Monte Carlo simulations. More specifically, the ability to detect the shielding materials of potentially harmful radioactive source and their geometry are evaluated.

PO.1.13

**CYTOGENETIC BIO-DOSIMETRY TECHNIQUES IN THE DETECTION OF DICENTRIC CHROMOSOMES (DCS) INDUCED BY RADIOLOGICAL EVENTS**

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Ionizing radiation (IR) is ubiquitous in the environment. Its source can be natural such as radioactive materials and cosmic rays or artificial, such as nuclear power plants. Overexposure to IR damages living tissue and could cause severe health problems (i.e. mutations, radiation sickness, cancer and death). Cytogenetic bio-dosimetry is the definitive assessment for exposure to IR recommended by the World Health Organization (WHO). This involves counting the frequency of Dicentric Chromosomes (DCs), the most studied chromosomal aberrations used as absorbed radiation biomarkers, during cells metaphase. A set algorithm tested on MATLAB has been previously developed to automatically identify DCs. Based on these algorithms It is developing an Automated Dicentric Chromosome Identifying software (ADCI) with C++/OpenCV. In conclusion, the final aim of this pioneering project will be to further increase this information in order to develop, thanks to Machine Learning techniques, an even faster identification system for DCs.

PO.1.14

**ARE CITIZEN SCIENTISTS READY TO MEASURE DOSES AND HEALTH/WELL-BEING INDICATORS WITH MOBILE APPS AFTER A NUCLEAR ACCIDENT?**

Liudmila Liutsko<sup>1,3</sup>, Paola Fattibene<sup>4</sup>, Sara Della Monaca<sup>4</sup>, Aya Goto<sup>5</sup>, Takashi Ohba<sup>5</sup>, Deborah Oughton<sup>6</sup>, Yevgeniya Tomkiv<sup>6</sup>, Vadim Chumak<sup>7</sup>, Adelaida Sarukhan<sup>1</sup> and Elisabeth Cardis<sup>1,3</sup>

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Participation of the general public ('citizen scientists') in post-accidental recovery is beneficial from both educational and data collection perspectives. Citizen data could complement official environmental monitoring and be used to model radionuclide releases and human response. The EU-CONCERT funded SHAMISEN SINGS (Nuclear Emergency Situations: Improvement of dosimetry, Medical and Health Surveillance – Stakeholders INvolvement in Generating Science) project aimed at exploring how citizens can participate in monitoring radiation doses and health/well-being indicators after a nuclear accident, through the use of mobile apps. Using an anonymous online survey, we evaluated whether stakeholders, including the general public (28 countries, total 401 participants) were aware of and interested in the use of apps for dose measurements following a nuclear or radiological emergency. Feedback was also gathered during discussions at workshops and conferences. Benefits of using such apps include obtaining valuable information and improving radioprotection culture among affected populations, which can turn reduce anxiety linked to accident-related uncertainties, contribute to environment and public health monitoring, and increase resilience in affected communities.

## POSTER SESSION 1.

Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020

Some existing apps on dose measurements were experimentally tested and compared to professional instruments to identify possible monitoring inaccuracies. Ethical issues related to the apps use, as well as the data management plan were discussed with stakeholders (ethics, social and humanities, app developers, radiation protection and health professionals).  
The paper will present the final recommendations of apps use for dose, health/well-being indicators use after nuclear accidents.

### ACKNOWLEDGMENTS

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PO.1.15

### PLANT TOXINS AND BIOTERRORISM: A REVIEW ON THE THREAT

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The intentional use of highly pathogenic microorganisms such as bacteria, viruses or their toxins to spread life-threatening mass-scale diseases which destabilize and devastate populations of areas is defined as "bioterrorism". This bio-crime involved the use of a biological agent whose aim is that of killing or sickening an individual, a small group of individuals or a mass group of individuals. Usually, this is generated through the motivation of a religious or ideological belief, monetary implications, political decisions or revenge. Nowadays, the success of a bioterrorism attack is not very realistic due to technical constraints and the actual difficulty arising from the implication of the latter. However, it is not unlikely. Even though the target of people attacked from a bioterrorism attack may be low, the implications at the social level are very high and the threat that the latter imposes on society today is higher than ever before. It is now a well-established fact that the capability to create immense panic and fear has allured the terrorists for the despicable use of biological agents (BAs) for causing terror attacks. In the era of biotechnology and nanotechnology, the accessibility in both terms of price and availability has spread fast; new sophisticated BA's are often being produced and used, aside from the conventional bacteria, viruses and toxins already known. Moreover, there are some which are becoming increasingly important within the environment of bioterrorism, such as toxins produced mainly by bacteria (e.g Botulinum Toxin, BTX), or Enterotoxyn type B, also known as Staphylococcal Enterotoxin B (SEB) and the extractions from plants. The most increasing records regard the dangerousness and the extraction/production of Ricin, Abrin, Modeccin, Viscumin and Volkensin. These five are the most lethal plant toxins known to humans. Even extremely low amounts of these toxins can potentially cause injury and mortality to a high extent if used properly. Because of potency, stability, relative ease of production, and worldwide availability of their source plants, these five toxins are considered to be potential biological weapons (BWs). Moreover, Ricin was also developed as an aerosol BW by the U.S. and its allies during WWII, but was never used during the battle. However, nowadays, there is an increasing record which shows how easy it can be to successfully extract plant toxins and transform them in biological weapons, regardless of the scale of the group of individuals.

PO.1.16

### RESPONSE TESTS OF SR12(EU) SCINTILLATION SPECTROMETERS FOR THYROID MONITORING IN NUCLEAR EMERGENCY SITUATIONS

Masahiro Hosoda<sup>1</sup>, Kazuki Iwaoka<sup>2</sup>, Akira Yunoki<sup>3</sup>, Takahiro Fukuhara<sup>4</sup>, Yusuke Imajo<sup>4</sup>, Yuki Tamakuma<sup>1</sup>, Shinji Tokonami<sup>1</sup>

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## POSTER SESSION 1.

Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020

We carried out response tests using two differently sized Sr12(Eu) scintillation spectrometers (1-in and 1.5-in) applicable to thyroid monitoring in nuclear emergency situations. The test system, which consisted of an I-131 source, a phantom on a 3D moving table and a spectrometer on a fixed table, has been developed by the National Institute of Advanced industrial Science and Technology. We chose five typical thyroid -neck phantoms (ANSI/IAEA, ORINS, ARADOS and neck parts of phantom for calibration of whole-body counters, one manufactured by CAMBERRA and the other by ORTEC). The counting efficiency of each spectrometer was evaluated as the net counting rate (cps) in the region of interest divided by the activity of I-131 solution (Bq) on the measurement date. The net counts of the full-energy peak of I-131 were accumulated to more than 100,000 counts which corresponded to 0.3% of the uncertainty of measurement. The counting rate of the background in the region of interest was also measured before measurements of the I-131 solution. The distance between the phantom surface and spectrometer surface was set from 0 cm to 6 cm and changed at 1 cm intervals, and thereafter it was set at 10 cm, 15 cm and 20 cm. To obtain the horizontal distribution of counting efficiency, the center of the detector was moved at 1 cm intervals from the center of the I-131 solution to 5 cm on each side. Additionally, the center of detector was moved at 1 cm intervals from the center of the source to 3 cm above and below it to obtain the vertical distribution of counting efficiency. In these response tests, the distance between the phantom surface and spectrometer surface was set at 0 cm, 5 cm and 10 cm. We will discuss the optimum measurement geometry for thyroid monitoring under nuclear emergency situations according to results of these response tests.

PO.1.17

### EVALUATION OF THE PERMANENCE OF FLAME ACCELERATING MATERIAL ON BURNED MATERIAL WITH GCMS ANALYTICAL TECHNIQUES

Claudio De Maio<sup>1</sup>

*1. Ministry of Interior - Italian National Fire Corps*

The aim of the work is to evaluate the permanence of the flame-accelerating material used to start a fire, even in largely burnt residues, in order to be able to recognize, even in the investigative context, whether the fire was caused by an accident or if it was facilitated by the emission (voluntary or non-voluntary) of a flame-accelerating substance. The analytical technique used to give answers to this is the use of the gas chromatograph-mass spectrometer (GC-MS) which allows to detect the presence of flame accelerators even in small quantities in the samples. A series of burnt material samples will be reproduced in a controlled environment, originally containing flame-accelerating materials and then compared to burnt samples without flame-accelerating agents. The results will be obtained through GC-MS analysis with the headspace (HS) and fiber (SPME) method, in order to evaluate, in greater detail, which of the two methods is the best performing to achieve the objective.

PO.1.18

### THE OPTIMISATION OF NUCLEAR REACTIONS FOR THE PRODUCTION OF INDUSTRIAL RADIOTRACERS USING UOB-TIP COMPUTATIONAL PACKAGE

R. AM Allen<sup>1,2</sup>, D. Hampel<sup>1,2</sup>, Tz. Kokalova Wheldon<sup>1</sup>, A. Hollands<sup>1</sup>, C. Wheldon<sup>1</sup>, P. Ivanov<sup>2</sup>, B. Russell<sup>2</sup>

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## POSTER SESSION 1.

Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
DAY 3 - 12 December 2020

Radiotracers are most commonly known for their application in medical physics. There are however far reaching applications in nuclear decommissioning and environmental monitoring. In these fields radiotracers offer detailed and accurate insight into a system, from determining isotope concentrations to particle migration. Radiotracers are often produced through charged particle bombardment upon a stationary target. One of the main challenges when developing a radiotracer is determining the optimum production route. In short the aim is to produce high quantities of the tracer nuclide, while avoiding the production of other contaminant nuclides which may impair the effectiveness of the tracer. To determine an optimum reaction route, a large number of possible beam and target combinations are compared over a range of energies. Currently, these calculations are performed using nuclear reaction codes such as TALYS[1] and EMPIRE[2]. These codes contain very thorough underpinning nuclear physics theory, however, they both require a large amount of data manipulation and have their limitations especially when comparing a large number or possible reactions.

This poster will present University of Birmingham - Tool for Isotope Production (UoB-TIP), a comprehensive interface program which has been developed to utilise and automate the EMPIRE and TALYS core functions, and data processing, while adding several additional functions for practical and accurate isotope production calculations.

[1] A.J. Koning and D. Rochman, "Modern Nuclear Data Evaluation with the TALYS Code System", *Nuclear Data Sheets, Volume 113, Issue 12, Pages 2841-2934. (2012)* <https://doi.org/10.1016/j.nds.2012.11.002>

[2] M. Herman, R. Capote, B.V. Carlson, P. Obložinsky, M. Sin, A. Trkov, H. Wienke, V. Zerkin, "EMPIRE: Nuclear Reaction Model Code System for Data Evaluation", *Nucl. Data Sheets, 108 (2007) 2655-2715.*

PO.1.19

### PERFORMANCES OF INTRUSION DETECTION SYSTEM USING KDD CUP 99

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Intrusion Detection System (IDS) is capable to monitor and detect network for malicious activity and policy violations, thus can protect network from protect network from threads. Besides, IDS also can classify the normal and abnormal packet. However, IDS had some issue in accuracy of classification detection. This paper presented different methods such as data mining classification, machine learning, filter based features selection and intensive pre-processing method using machine learning technique to review the accuracy rate of abnormal packet using KDD Cup 99 dataset. A few methods produced effective classification and also identifying new threats. This work evaluates the parameters that play the major role in enhancing the efficiency and accuracy of IDS. According to the result, filter based feature selection achieved 99.85% accuracy of abnormal packet, which is the highest accuracy among techniques reviewed.

PO.1.20

### DESIGNING A NEW APPROACH FOR RISK REDUCTION DURING PANDEMIC EMERGENCIES LIKE SARS-COV-2: POST-MORTEM INVESTIGATION THROUGH VIRTUAL AUTOPSY TECHNIQUES

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Natural outbreaks of biological agents, causing local and global emergencies, have impacted human safety, social/political/economical activities, and the security of critical infrastructures. Lessons learned by previous emergencies have been used by decision-makers not only to improve the phases of prevention, intervention, and recovery of normality but also to facilitate the dual-use of methods, instruments, and technologies. A crucial phase of emergency management is the investigation that in the past was based on questioning, suspicions, witnesses, and often unreliable evidence. Nowadays investigation is supported by technology and various types of forensics that are deeply involved. The authors in this paper consider the pandemic outbreak of SARS-COV-2 as a case study and propose virtual autopsy by postmortem CT (PMCT) as a technique to facilitate post-mortem examinations on ascertained or suspected SARS-COV-2 cases. This method reduces the risk of infection for the operators that have to conduct the particular investigations during the emergencies.

**POSTER SESSION 1.**

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PO.1.21

**ACCURATE NUMERICAL EVALUATION OF HUMAN EXPOSURE TO BROADBAND RADIATED FIELDS BY PORTABLE SYSTEMS**

Agostino Monorchio<sup>1</sup>, Eliana Canicatti<sup>1</sup>, Elisa Giampietri<sup>1</sup>, Danilo Brizi<sup>1</sup>, Nunzia Fontana<sup>1</sup>

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SAFELAB - Laboratory for the Evaluation of the Safety of Portable Intentional Electromagnetic Sources (Piano Nazionale di Ricerca Militare - PNRM)

PO.1.22

**THREATS TO PLANT HEALTH: IMPACT AND RISKS FOR HUMAN SECURITY**

Stefania Tegli<sup>1</sup>, Giovanni Agati<sup>1</sup>, Luca Calamai<sup>1</sup>, Lucia Cavigli<sup>1</sup>, Dario Gaudioso<sup>1</sup>

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SFINGE – Spettroscopia Fotoacustica e volatlloma coNtro l'aGroTerrorismo (Piano Nazionale di Ricerca Militare - PNRM)

PO.1.23

**CBRN RISK COMMUNICATION TO MEMBERS OF THE PUBLIC IN CASE OF A TERRORIST ATTACK**

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It has been widely recognized the magnitude of danger related to the use of CBRN agents for terrorist attacks. Some of them have already occurred but everything suggests that the worse period is ahead and coming soon as long as we do not take appropriate preventive measures to minimize such danger. A special case among those alternatives presents the attack based on the dispersion of radioactive material by means of explosives or other spreading devices which scatter radionuclides in order to cause the exposure of persons and radioactive contamination of the targeted site or installation. In some cases, terrorists may intend to attack a specific place or to assassinate a selected person, e.g., a politician or a member of the enemy gang, using unmanned aerial vehicles (UAVs), usually known as drones, carrying high activity radioactive sources. The protection against such an attack would be almost impossible since perpetrators can use several UAVs pre-set to reach the specifically chosen object. For this purpose, even the swart of drones can be used where any of the present protective measures would be inefficient.

The paper discusses some current aspects and problems of the potential use of drones to commit radiological attack and presently available protective measures for avoiding such attacks or minimizing their consequences.

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Chairpersons: Dr. Andrea Chierici, Dr. Riccardo Quaranta, Dr. Ahmed Ibrahim Gamal  
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PO.1.24

**DISPLACEMENT, RISK AND RESILIENCE: REBUILDING THE LIVES OF INTERNALLY DISPLACED WOMEN IN NIGERIA PLAYFULLY**

Jayne Mwangi<sup>1</sup>, Victor Ladan Lutsili<sup>2</sup>, Desire Adebimpe Fashina<sup>2</sup>

*1. Technical University of Mombasa, Kenya*

The debate about the effective and efficient way to assist the number of people displaced by conflict has increased and gained momentum due to worldwide awareness. Multifaceted causation is related to the impact of displacement and has an adverse effect on the establishment of daily stress, exposure to traumatic events and impoverishment. Several cross-sectional studies among policymakers, researchers and practitioners reported that although all displaced persons are vulnerable, women are the most vulnerable within the vulnerable (Haumeder,2018). Researchers have used methodological approaches such as harm-reduction, empowerment programmes, protection and promotion in conducting resilience-related and mental health-related problems. Current humanitarian efforts and efficacy have proven to be unreliable as women still suffer from severe trauma in three different phases of displacement. Using a combination of literature reviews, interviews, and field-based study through an exploratory design, this research answers the following question: Is play a communication strategy that can strengthen the resilience of the internally displaced persons (IDPs)? The design of the research is based around two current debates in the humanitarian sector: The practical application of resilience, especially in complex emergencies and how the humanitarian sector can meet the needs of IDPs more have not been effectively explored. This research reports the significant findings on the impact of the resilience trajectory on the internally displaced women. Play is a powerful tool for empowering and preparing the internally displaced women for the development and resilience process ahead. A displaced woman through play can explore and address her past and current emotion. This study aims to propose a communication resilience strategy through play to enhance life skills including reconciliation; emotional regulation; social connections and problem-solving skills.

PO.1.25

**RISK ASSESSMENT INSTITUTIONAL APPROACHES FOR DISASTERS MANAGEMENT: US, UN AND EU CASES**

Marco Carbonelli<sup>1</sup>, Mariachiara Carestia<sup>1</sup>, Riccardo Quaranta<sup>1</sup>

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In the literature we can find many definitions of risk applied to disaster management, even for the case of terrorist attacks. In this paper, an analysis of the different institutional approaches used for the risk definition in this field is discussed. In particular, are considered and compared the definitions and the approaches proposed by United States of America - DHS (Department of Homeland Security) and FEMA (Federal Emergency Management Agency)-, by United Nations – in the United Nations Office for Disaster Risk Reduction (UNDRR) activity, and finally by European Union, both at the Commission level and in the EU JRC (Joint Researcher Center).

The analysis provided shows that the concept of risk in these specific areas of the disaster management implicitly refers to other fundamental quantities. The first two we need to discuss in the paper are the concepts of threat and hazard, intended in general sense as a very specific event characterized by a given probability of occurrence in a specific period of time. Other quantities necessary for the analysis are asset and exposure, used to describe in the area of the disaster, for example, the population, the economic activities and values, symbolic and iconic references and other values to be protected. A further quantity of interest in the analysis is related to the possible weaknesses, the vulnerability, that characterize these assets/exposures and make them susceptible to the damaging effects of a threat/hazard. Finally, the practical negative evidences of the risk effect is described by the quantities consequence or impact that, as will be discussed, are used as synonyms (for example, the results after a terrorist event measured as number of fatalities and casualties, economic loss, building damage, ...). The comparison of the different approaches proposed for the risk quantity will provide important evidence of different practical application that make the values of the evaluated level of risk conceptually different in different organizations and political geographical areas.

**POSTER SESSION 2.**

Chairpersons: Dr. Daniele Di Giovanni, Dr. Mariachiara Carestia, Dr. Riccardo Rossi  
DAY 3 - 12 December 2020

**POSTER SESSION 2. [12 December 2020, 04.00 p.m. - 07.00 p.m. (UTC+1 - Italian Time),  
Virtual Room: Leonardo]**

**PO.2.1**

**THE CENTRAL ROLE OF INTERNATIONAL COOPERATION IN SUPPORTING LOCAL HEALTH AUTHORITIES IN POST-CBRNE: THE DEVELOPMENT OF THE KURDISTAN REGIONAL GOVERNMENT HEALTH INFORMATION SYSTEM (KRG\_HIS), AN EXAMPLE OF BEST PRACTICE**

Stefania Moramarco<sup>1</sup>, Faiq Basa<sup>3,2</sup>, Haveen Alsilefanee<sup>3,3</sup>, Sivar Qadir<sup>3,4</sup>, Shahla Othaman<sup>5,6</sup>, Bayar Azeez<sup>6,7</sup>, Gorgees Shlimon<sup>6,7</sup>, Luma Alhanabadi<sup>3,8</sup>, Daniele Di Giovanni<sup>9</sup>, Leonardo Palombi<sup>1</sup>, Leonardo Emberti Gialloreti<sup>1</sup>

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Iraq has been interested by many CBRNe events during the last decades. Each one of them resulted in heavy casualties and in vast population displacements, while significantly debilitating the public health system of the country, with epidemiological surveillance being nowadays almost nonexistent. To support the recovery of the public health system in the Autonomous Region of Iraqi Kurdistan (KRG), in 2015, the Department of Biomedicine and Prevention of the University of Rome Tor Vergata, with the financial support of the Ministry of Foreign Affairs and International Cooperation of Italy, set up an informatics platform for epidemiological surveillance (KRG DHIS2). The informatics system gathers on a day-to-day basis health-related data from the main public health facilities using an internationally recognized coding system (ICD-10).

After the end of a pilot phase and a preliminary implemental stage - during which nearly 60 health facilities have been enrolled in the program and a team of local experts and trainers was established—the informatics system has now been endorsed by the Ministry of Health of the KRI as the official health information system (HIS) of the Region: the the Kurdistan Regional Government Health Information System (KRG HIS).

The goal is to reach 120 operative centers in the region within the next three years (at least 50% of the overall main health facilities in KRG), envisaging a subsequent expansion of the system to all Iraq. The main aim of the program is to assist the local health authorities in creating a functioning health monitoring system, essential in guiding the development of appropriate public health interventions: a key instrument to prepare the health system to early respond to future emergencies.

**PO.2.2**

**NUMERICAL SIMULATIONS OF THE DUST PARTICLE RELEASE DURING A LOSS OF VACUUM ACCIDENT IN A NUCLEAR FUSION REACTOR**

Rossi Riccardo<sup>1</sup>, Pasquale Gaudio<sup>1</sup>, Luca Martellucci<sup>1</sup>, Andrea Malizia<sup>2</sup>

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## POSTER SESSION 2.

Chairpersons: Dr. Daniele Di Giovanni, Dr. Mariachiara Carestia, Dr. Riccardo Rossi  
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A loss of vacuum accident is one of the possible phenomena that may be triggered by off-normal events in nuclear fusion reactors, such as disruptions. After a break of the isolation system and the formation of a penetration line, the air flows inside the Tokamak due to the large pressure gradient, resuspending toxic and radioactive dust. At the end of the event, an over pressurisation of the vacuum vessel may occur due to inertia effects and the heating of the air through the first wall, that may have still high temperatures. Thus, air will flow from the inside to the outside, dragging the dust particles and involving a radiological and toxic release. This work aims to provide, by numerical simulations, an analysis of particle release as a function of main parameters that characterise the release: diameter of the penetration line, wall temperature and particle sizes. The numerical simulation is based in a one-way coupling. Starting from the simulation of the velocity, pressure and density fields of the continuous phase (air) by a monophasic compressible CFD model, the motion of the particles inside the vessel is simulated.

PO.2.3

### APPLICATION OF DIFFERENTIAL DIODE LASER ABSORPTION SPECTROSCOPY FOR REMOTE DETECTION OF TOXIC GASES

Romanelli Sara<sup>1</sup>

1. *International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy*

Diode laser-based absorption spectroscopy (DLAS) is widely used for gas detection in a variety of applications across the energy, petrochemical and mining industries. The availability of near-infrared diodes that can operate at room temperature has expanded the application of spectroscopy technique in hand-held gas detection devices for environmental monitoring. Moreover, remote sampling and analysis is crucial in case of suspect contamination by a chemical warfare agent or in case of release of a toxic industrial chemical. Thus, a novel miniaturized DLAS-based sensor for toxic gases is reported.

PO.2.4

### RISK ASSESSMENT OF RADIOACTIVE WASTE

Micozzi Andrea

1. *International Master Courses in Protection against CBRNe Events, University of Rome Tor Vergata, Italy*

The main objective of the thesis topic is to analyze the most common problems related to the management and disposal of radioactive waste in our country such as the location and construction of deposits for waste disposal, the progressive saturation of storage deposits or management of so-called "problematic waste currents" (e.g. graphite, orphan sources, organic liquids, mixed waste), the risk assessment of radioactive or toxic substances that can be released into the environment and the equivalent doses that can be absorbed by the human being in order to verify their correct disposal in the designated sites.

PO.2.5

### EU PREPAREDNESS AND RESEARCH OF SECURITY FOR CBRNe THREATS

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## POSTER SESSION 2.

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The main goal of this paper is to present a brief review of the existing legislative framework, the main European Research & Innovation findings, and the current trends in terms of the stakeholders' point of view against to the Chemical, biological, radiological, and nuclear (CBRNe) threats. Europe is facing an evolving security environment that includes a wide range of threats, challenging the overall resilience of societies and preparedness systems. CBRNe threats are intricate and horizontal in nature. The analysis of National Risk Assessments (NRAS) shows that CBRN risks are a major concern for the majority of the Participating States in the Union Civil Protection Mechanism (UCPM). Growing interdependencies between different sectors and critical infrastructures(CI) can mean that a single incident may have significant cascading effects. Extreme weather events —such as storms, floods, heatwaves, and drought- complicate the threat landscape. The line between manmade threats and natural hazards can become blurred, especially if elements of a hybrid nature such as disinformation are involved. Emergencies may be accelerated or provoked by hybrid activities aiming at destabilising societies. In addition, hybrid campaigns can involve multiple incidents in more than one sector. The tools and tactics used can be very low-profile, making them hard to detect and attribute, while potentially having a high impact. New and complex combinations of threats require civilian actors and civil protection authorities to be aware of and evaluate the resilience and flexibility of the systems currently in place. Future needs for response and preparedness may be difficult to predict, which calls for flexibility. EU is funding a series of R&I projects that contribute to the efforts, mainly under the Horizon2020 and FP7 frameworks. The upcoming research and innovation framework program Horizon Europe, under the cluster 3, demonstrates the importance of financing, investing, cooperating, and protecting against CBRNE threats.

PO.2.6

### CBRN-P<sub>3</sub> CLUSTER

Paola Tessari<sup>1</sup>, Karolina Muti<sup>1</sup>, [Gianna Latini<sup>1</sup>](#)

*1. Istituto Affari Internazionali (IAI)*

This Poster illustrates the Cluster CBRN-P<sub>3</sub>: the technological, industrial and institutional Cluster for the Preparation, Prevention and Protection of the environment and the population from CBRN risks. The Cluster is a network involving institutional and industrial actors, together with the scientific community. The Cluster focuses on prevention and protection of the citizens and the environment from CBRN risks. In 2017 a meeting among the relevant stakeholders represented the starting point for cooperation which, following the European example, led to the creation of the CBRN-P<sub>3</sub> Cluster, with the aim of gathering the available expertise, skills, and know-how in this field.

The CBRN-P<sub>3</sub> Cluster aims at:

- 1) being a credible stakeholder for the relevant institutions, as well as national and local interested authorities in charge.
- 2) promoting the participation of its' members to European programmes and funding.
- 3) drawing the attention of the world of politics and of public opinion on the CBRN sector, therefore fostering a more sustained growth in the market of CBRN protection, prevention and emergency management.

PO.2.7

### RECURRENT NEURAL NETWORK CLUSTER, A NEW INSTRUMENT FOR THE PREDICTION OF INFECTIOUS DISEASES

[Puleio Alessandro<sup>1</sup>](#)

*1. Independent researcher*

## POSTER SESSION 2.

Chairpersons: Dr. Daniele Di Giovanni, Dr. Mariachiara Carestia, Dr. Riccardo Rossi  
DAY 3 - 12 December 2020

Infectious diseases afflict human beings since ancient times. We can classify the infectious disease in two principal types: the emerging diseases, that are caused by new pathogens, and the re-emerging diseases, due to a new spread of a known pathogen. Both of these types can then subdivide in natural, accidental or intentional spreads.

The risk associated to infectious diseases strongly increases in the last decades, especially because of the globalization, which leads to a denser and more efficient link between nations, involving that a local infectious may easily spread worldwide, such as the SARS-CoV2 in 2019-2020.

The development of new methods to predict the spread of diseases is crucial. However, sometimes the variables are too many that classical algorithm fails in the prediction.

Aim of this work is to investigate the use of a cluster of recurrent neural networks for disease prediction, using real flu's data to train and develop an instrument with the capability to determine the future flues. Two different types of studies have been conducted.

The first study investigates the influence of the neural network architecture, and it has been performed using 12 seasons as training and 3 seasons as test. The second test aims to investigate the number of seasons needed to have a good prediction for the future ones. The results demonstrated that this approach could ensure very high performances also with simple architecture. The cluster approach allows to have information about the uncertainty of the prediction, allowing also to take countermeasures as a function of that value. In the future, the use of this approach may be applied to many other types of disease.

PO.2.8

### DNMTs ASSOCIATED GLOBAL EPIGENETIC SILENCING PROMOTES BREAST CANCER METASTASIS

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Epigenetic changes induced by DNA methylation is involved in different human cancers. Over expression of DNA methyltransferases result in hypermethylation and down regulation of tumor suppressor genes. This will lead to neoplasia and cancer progression. Hypermethylation caused by DNA methyltransferases in tumors contributes to tumor progression. The aim of this study was to investigate the expression level of DNA methyltransferases (DNMTs) in breast cancer patients undergoing chemotherapy. In this research, level of mRNA was measured from blood samples of breast cancer patients through semi-quantitative RT PCR analysis. The outcome of this study demonstrated higher expression level of DNMT3A and DNMT3B in breast cancer patients with advanced stage of cancer. Overexpression of DNMT3A and DNMT3B is associated with increased DNA methylation in cancer related genes and subsequently with tumor grade and metastasis. Higher level of metastatic marker TWIST1 was seen in all samples. Increased level of TWIST1 tends to impart tumor development and metastasis. Positive regulation was found between TWIST1 and DNMTs level. Epithelial to mesenchymal transition (EMT) marker E-Cadherin (CDH1) was negatively regulated in cancer patients. Decreased level of CDH1 is a significant feature of EMT in progression and advancement of epithelial tumors to metastatic cancers. Taken together higher expression of DNMTs and TWIST1, decreased expression of cadherin markers contributes in cancer metastasis and poor prognosis.

PO.2.9

### CWA DISPOSAL: A NEW APPROACH

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## POSTER SESSION 2.

Chairpersons: Dr. Daniele Di Giovanni, Dr. Mariachiara Carestia, Dr. Riccardo Rossi  
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After the The Chemical Weapons Convention (CWC) entered into force, the goal of achieving the complete elimination of chemical weapons arsenals has absorbed human and financial resources in all countries that have ratified the convention. Currently the most used technologies for these disposal activities are based on chemical or thermal destruction; others are being studied and are at various stages of development. In this work, the strengths and weaknesses of the aforementioned technologies were compared with respect to the type, quantity and degree of conservation of the arsenals to be disposed of. On the basis of the evaluations, a correlation guide has been produced which allows to obtain the best intermediate results of disposal effectiveness and cost-effectiveness.

PO.2.10

### CONTACT-FREE AND FAST DETECTION OF ENERGETIC MATERIALS IN CONTAINMENTS

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The identification of explosives or hazardous substances in a package is an important challenge for most analytical methods in the field of CBRNE detection. Known techniques can generate a first suspicion, for example by detecting small traces on the object's surface or with the help of imaging methods like x-ray in order to provide information about the internal structure. Technical solutions for clarification in such a situation and in particular for the identification of unknown substances in containments are urgently needed to decide further steps.

Opening a package without knowledge of the contents and its resulting hazards is highly involved with risks and should be avoided whenever possible. Therefore, preferred methods work non-destructive or can be performed with minimal interaction capable of identifying target substances in a containment quickly and reliably.

To solve this problem, a combined laser drilling method with subsequent identification of the target substance by means of Raman spectroscopic measurement through microscopic bore holes of the package is presented. Advantages are the non-contact operation of the method, the minimal intervention with the examined as well as the fast availability of significant results on site without the need for complex laboratory analyses. A pulsed laser beam is used for both the drilling process and as an excitation source for the raman analysis in the same optical setup.

Results show the ability of this new method to gain high quality spectra even when measured through microscopic bore channels. With the right chosen laser parameters, the method can be even performed on highly sensitive explosives like triacetone triperoxide (TATP). Another advantageous effect is an observed reduction of unwanted fluorescence signal in the spectral data, resulting from a confocal-like measurement with the bore hole as aperture.

PO.2.11

### COVID-19 - EFFECTS OF CORONAVIRUS ON THE EUROPEAN SOVEREIGN CREDIT DEFAULT SWAPS MARKET

Oumayma Nadir<sup>1</sup>, Daoui Driss<sup>1</sup>

*1. Analyse, évaluation et gestion des risques*

As coronavirus disease (COVID-19) spreads around the world, fear and uncertainty increase, driving financial markets and pushing the global economy into recession. Governments are addressing this pandemic with a mix of health, macroprudential, fiscal, monetary and market policies. In this article we assess the impact of the pandemic in Europe on sovereign CDSs using an event-study methodology. Also we use Moody's Analytics Credit Edge™ public firm EDF™ (Expected Default Frequency) metrics to assess the impact that the coronavirus has had so far on credit risk by highlighting company-, industry-, and country-level dimensions of the pandemic's repercussions, including both risks and opportunities. We find that a higher number of cases and deaths and public health containment responses significantly increase investor uncertainty in European government bonds. Other government policies amplify the short-term effect as supply chains are disrupted.

## POSTER SESSION 2.

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PO.2.12

### ALLIUM CEPA USED AS A BIOTA FOR DETECTION OF RADIOLOGICAL AND NUCLEAR EMERGENCIES

Magno Nogueira Xavier<sup>1</sup>, Ruan Pitágoras Melo Feitoza<sup>1</sup>, Silmara de Moraes Pantaleão<sup>2</sup>, Ricardo Scher<sup>3</sup>, Francesco d'Errico<sup>4,5</sup>, Susana Oliveira de Souza<sup>1</sup>

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4. School of Engineering, University of Pisa, Pisa, Italy

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Radiological and nuclear emergencies are typically associated with unintended and unexpected episodes, involving a source of ionizing radiation. Currently, these events also include possible criminal or terrorist actions produced by combining chemical, biological, radiological, nuclear, and/or explosive agents. The common element among all these scenarios is the rapid dispersal of radioactive material in the target areas. Therefore, they pose great risks to human and environmental health. The sudden and unwanted exposure of healthy cells and tissues to ionizing radiation is potentially genotoxic, that is, it can induce genetic instability and, consequently, produce several cellular changes. The connection between the frequency of radioinduced responses in cells, called endpoints, and the dose, is known as cytogenetic dosimetry. The information obtained from these analyses is extremely valuable, as it allows estimating the degree of impairment of a biological system. Cytogenetic analyses can be performed on organisms of all taxonomic categories. Higher plants are the main support system for humans because, in addition to providing a first screening for environmental genotoxicity, they avoid the use of animal models for testing. The International Commission on Radiological Protection (ICRP) has recognized the need to provide more quantitative advice on environmental protection as well. A required assessment is the correlation between dose and its effects in non-human biota. *Allium cepa* is a well-established standard in vivo model for assessing a wide variety of genotoxic agents. By differentiating the effects caused by different dose levels or types of radiation, it would be possible to use *Allium cepa* as a cytogenetic dosimeter both to monitor the environment and to investigate the dose received by people in environments where a radiological emergency has occurred. In previous work, the effect of high doses of radiation was investigated in the *Allium cepa*. In this work, we investigated endpoints induced in meristematic cells of *Allium cepa* by exposures to low doses of radiation. Micronucleus frequencies were used to construct cytogenetic dose-response curves. An increase in the frequency of micronuclei proportional to the dose was observed. This study demonstrated that it is possible to use *Allium cepa* as a support system for analysis of cellular effects induced also by low doses of radiation in the environment.

PO.2.13

### DESIGN AND OPTIMIZATION OF MINIATURIZED SENSORS FOR UAV APPLICATION: A NEW PATHWAY FOR EARLY WARNING

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## POSTER SESSION 2.

Chairpersons: Dr. Daniele Di Giovanni, Dr. Mariachiara Carestia, Dr. Riccardo Rossi  
DAY 3 - 12 December 2020

Last decades the increasing of threats associated to C, B, R agents, especially to the dual use materials derived from industry (TIM toxic industrial material), brought to the need of development of new tools to detect and collect samples without put in danger first responders inside contaminated area. These solutions foresee the integration with UAV of different detectors and sampling systems. Preliminary studies start to detect chemicals substances (warfare and not) and collect air samples that could allow notice and withdraw chemicals, biological and/or radiological substances through different payload. The use of two sensors with different working principles, Metal-Oxide (MOX) and Photo Ionization Detector (PID), allows to confirm the presence of chemicals in a contaminated area. As sampling tool, has been chosen a personal device, Pocket Pump Touch, that permits to collect air samples, gas or vapour, trapped it into different cartridges depending on the substances involved and in the analysis device.

All instruments should be integrated on the payload of an aerial vehicle and used for different purposes. Employment of this equipment could be for both military and civilian applications. For instance, it this equipped vehicle could be used in support of specialistic military teams such as R/C survey team, involved in recognition mission, and SIBCRA team, tasked to perform sampling in contaminated areas, to exploit presence of CBR substances in field and then confirm, collect and evaluate the effective threat. On the other side, this equipment could find application in the civil world for what regards emergency team involved in industrial incident in the monitoring of the plant area. Many applications could be allowed by the use of small size of vehicles gaining capacity with the connection of different instrument for detection and collection of samples. These characteristics make vehicle versatile and easy to use in several fields, also with ordinary equipment.

PO.2.14

### THE RE-EMERGENCE OF CHEMICAL THREATS AND THE ROLE OF THE OPCW. THE ENTRY INTO FORCE OF CHANGE TO SCHEDULE 1 OF THE ANNEX ON CHEMICALS TO THE CHEMICAL WEAPONS CONVENTION AND THE IMPACT IN THE INDUSTRY

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The confirmed use of chemical weapons in the Syrian civil war and the poisoning of political opponents or enemies through nerve agents shed light on the re-emergence of chemical threats and the role played by the Organization for the Prohibition of Chemical Weapons (hereafter OPCW). The authors of this paper, after providing for a review of the courses of action undertaken by the OPCW in order to investigate the alleged use of chemical weapons, will assess the capacity and, ultimately, the effectiveness of the Chemical Weapons Convention and its implementing body to face current challenges posed by the newest class of nerve agent (i.e. novichok). It is therefore important to build on the analysis of the Convention emendation process and the strengthening of the verification toolkit with a view not just to developing appropriate effectiveness indicators, but also to considering their impact on the international verification regime and, consequently, on the chemical industry at national level.

PO.2.15

### UAV MODULAR PAYLOAD FOR MISSION-ORIENTED CONFIGURATIONS IN THE SURVEY AND MONITORING OF AREAS EXPOSED TO CHEMICAL AND RADIOLOGICAL CONTAMINATION

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In the light of recent developments in the employ of Unmanned Aircraft Vehicles (UAV), we witnessed an increasing of their use in sectors connected to safety and security both for military and civil applications, to support and substitute first responders in critical environments and gather information for disaster management after an accidental release.

On the other side, there is currently a strong concern for incidents connected to toxic industrial chemicals (TIC) and toxic industrial radiological (TIR) release and, moreover, to intentional use of TIC and TIR's in improvised devices during asymmetric conflicts. In consequence of this worry a huge number of specific detection, identification and sampling tools have been developed. However, the integration of UAV with C/R detectors and sampling capabilities is not already been deeply investigated and could solve a wide range of problems connected to first responder's safety, such as reduce human exposure in contaminated environments.

Indeed, in case of areas susceptible to contamination such as industrial districts or location characterized by unstable governments with possible non-state actors use of non-conventional agents, an early detection of the substance involved could consent the hotspot identification and the tracking of the release plume movement. This Survey mission could be performed by a fleet of micro-drones, equipped with low cost and low weight, able to patrol a wide area and detect any variation from an environmental baseline to give a first alarm.

With the evidences collected by the Survey mission, a sampling and identification of C/R agents (SICRA) mission can be deployed, to proceed to event data collection with the due chain of custody. This SICRA mission could be performed by a mini-drone, modular and flexible to be equipped with specific mission-oriented detectors, able to identify with good confidence the source of contamination. Moreover, with a customized sampling system representative evidences could be collected from different environmental matrixes for subsequent laboratory analysis.

PO.2.16

### COMMUNICATION AND DECISION SUPPORT SYSTEMS FOR RESCUE AND EMERGENCIES

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In emergency contexts, communication activities are particularly important for the support of the top decision-making bodies, in order to evaluate "just in time" the best actions to be taken. At the same time, however, the problems to be overcome in order to deal with emergency situations, both in carrying out rescue interventions and in the management of emergencies of natural or anthropic origin, can be multiple and, especially in recent years, require specific skills in different areas. This need arises from the fact that, upon the occurrence of a calamity, the authorities managing the relief must answer questions such as "is a given place safe from the threat (e.g. An oncoming flood)?" In particular, today in-depth knowledge of all those platforms that can support decisions to be taken in risk situations is increasingly necessary: the so-called decision support systems (DSS), software that allow to increase the effectiveness of analysis of the situation, support to all those who have to make strategic decisions. Hand in hand with the growing interest in DSS by organizations that deal with rescue and civil protection, there is an ever greater use by the organizations themselves of communication systems and, in particular, those examined on information technology. The first responders of the Italian Fire and Rescue Service operates daily in emergency scenarios and they know well that in order to face the situation, where resources must be used in the best possible way in a short time, everything must be prepared and planned, also communication. In fact, there is often an effective integration between decision support systems and communication and data transmission systems, because managing information and communications well is of fundamental importance for making correct decisions and carrying out rescue activities in the best possible way.

PO.2.17

### PREVALENCE OF OCCUPATIONAL DISEASES DUE TO BIOLOGICAL AGENTS ON WORKFORCE POPULATION (OVERALL AND BY SECTORS) IN ITALY IN THE YEARS 2014-2018 USING INAIL AND ISTAT DATABASES

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## POSTER SESSION 2.

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Objectives: Investigate incidence of occupational diseases caused by biological agents in Italy among workers in the last 5 years, providing an epidemiological measure of industrial risk and its impact on workers' health.

Methods: Data regarding Italian workers were collected from Italian National Institute of Statistics (ISTAT). Value of workers population was defined as the average number of workers for years 2014-2018. Data regarding disease cases were collected from Italian National Insurance Against Injuries on Workers Institute (INAIL). Standardized Incidence Ratios (SIRs), Observed/Expected Ratios (OERs), and their Confidence Intervals (CIs) were calculated and mapped for every province of the country. Results: 639 (0,2%) diseases from biological agents were recorded over a total of 293703 occupational diseases. Asthma was the most frequent disease (n=219, 34,3%), while nasal-paranasal cavity tumor and rhinitis were also common (168 and 83 cases, 26,3% and 13,0% respectively).

Sardinia, north-eastern and north-central Italy had a significantly higher occupational risk; difference in agricultural and industry type present on the territory may be the cause.

Strengths and Limitations: This is one of the first works which combines data from different national databases in order to define biological risk for workforce population. Limits of the study are the impossibility to define time of exposure and eventual previous expositions due to the way the public databases are structured; also, there is no possibility to have a linkage with other health data.

Discussion and Conclusion: While it is not possible to determine the causes for the differences found among territories, it is worthwhile to determine and map incidence using real world data. In this case, connection between biological working exposure and specific respiratory diseases can be proved. Local public health officers should focus their prevention and screening programs on nasal-paranasal cavity tumor, which is the most frequent invalidating disease found.

PO.2.18

### CONVERGENT APPROACH TO DYNAMIC SYSTEMS SAFETY – COGNITIVE ASPECTS

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The aggravation of the problems of security of energy, transport and other systems is due to their increasing dynamic and statistical complexity. This limits the possibilities of modeling and predicting the functioning of a dynamic system in extreme conditions. On the other hand, the impact of destabilizing factors increases cognitive complexity due to the diversity of models, patterns and indicators that make it difficult to identify relevant sources of information. The aim of the work is cognitive visualization of topological models of the functioning of dynamic systems based on the convergent approach. It is based on the relationship of local distortions of the fractal signal of the functioning of the object of research with the features of its dynamics. The visualization was carried out by reconstructing the topological 3D model of functioning according to the measured time series. Orthogonal projections of this model are graphic images of its cycle of functioning. The topological 3D model of the fractal signal and signature configurations reflect the features of the real-time operation cycle. In the natural decomposition of graphic images, informational features of the functioning of the elements of a dynamic system are manifested. Such visualization makes it possible to study the spatio-temporal structure of signals of different nature in real time using probabilistic and deterministic methods.

In the space of dynamic events, the latent spatio-temporal features of fractal signals become available for cognitive analysis. This allows you to identify relevant sources of information and predict their work in difficult conditions. Atlas of 3D models and spatio-temporal structures of fractal signals from sensors (detectors, etc.) simplifies the selection of relevant sources, their identification and classification. Such an atlas is of particular interest for predictive analytics and critical infrastructure monitoring.

PO.2.19

### APPLICATION OF EYE TRACKING TECHNOLOGY FOR ASSESSMENT AND ASSURANCE OF SECURITY AND SAFETY-CRITICAL SYSTEMS

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	<p><i>2National Aerospace University "Kharkiv Aviation Institute" (KhAI), Department of Computer Systems, Networks and Cybersecurity</i></p> <p>Eye tracking technology (ETT) is based on tracking of trajectory of a user's eye movement. The basic principle is to illuminate the user's retina with infrared light and the user's focus of attention is calculated from the reflected beam, i.e. where the user is looking this moment of time. A technical device that directly reads values from a user's eyes is called an eye tracker. As a rule, such device implemented in the form of an additional device attached under the monitor or in the form of glasses. On the basis of a mathematical model, the focus of a user's attention is calculated and, accordingly, the user's visual route is built. Eye tracking technology is used to solve various tasks, for example, for marketing research, assessing the user interfaces quality, developing simulators for operators, etc. The paper discusses the concept of using the eye tracking technology for assessment and assurance of cybersecurity, safety and usability. Possibility of eye tracking technology application for solve of task of person digital identification is review separately. Solving such task can be achieved through reproduction of a certain trajectory with use of user's vision, for example in the form of a circle, square, rhombus, zigzag, word, etc. The technique is based on eye tracking technology can be used as a basic or additional technique for identification of a person. For implementation of the technique for identification of a person need to define values of following initial data: the starting point of the focus of user attention – is the beginning of the visual route; direction of the visual route; additional trajectories of the visual route. Case study of ETT application for assessment and assure of human-machine interface for safety related system and security of access control system are discussed. Corresponding metrics are analysed.</p>
PO.2.20	<p><b>F.A.Q. - (Filtered Air Quality) – APPLICATION FOR FILTERING AND MONITORING THE QUALITY OF BREATHING AIR</b></p> <p>Roberto Mo<sup>1</sup>, Fabrizio Pirri<sup>1</sup></p> <p><i>1. Dept. of Applied Science and Technology - Politecnico di Torino</i></p> <p>FAQ – Applicazione per la filtrazione e monitoraggio della qualità dell'aria respirabile. (Piano Nazionale di Ricerca Militare - PNRM)</p>
PO.2.21	<p><b>NEW TECHNOLOGIES FOR THE CBRNe FILTRATION THROUGH NANOTECHNOLOGIES AND FOTOCATALYSIS</b></p> <p>Giovanni Baldi<sup>1</sup>, Luca Pinciarelli<sup>2</sup></p> <p><i>1. COLOROBBIA CONSULTING – Centro Ricerche COLOROBBIA</i></p> <p><i>2. BMD spa</i></p> <p>Rimozione degli agenti chimici dai flussi d'aria, mediante nanotecnologie e fotocatalisi. Nuove tecnologie per la filtrazione CBRN/NBC. (Piano Nazionale di Ricerca Militare - PNRM)</p>
PO.2.22	<p><b>PAPER-BASED ELECTROCHEMICAL DEVICE FOR ON-SITE AND RAPID DETECTION OF BOTULINUM NEUROTOXIN SEROTYPES A AND C</b></p> <p>Fabiana Arduini<sup>1</sup>, Veronica Caratelli<sup>1</sup></p> <p><i>1. Department of Chemical Science and Technologies – University of Rome "Tor Vergata"</i></p> <p>BIAPATBONT - Sviluppo di un sistema di rivelazione basato su aptameri per l'identificazione di neurotossine botuliniche. (Piano Nazionale di Ricerca Militare - PNRM)</p>
PO.2.23	<p><b>A GENERAL MULTI-RISK ASSESSMENT METHOD FOR NATURAL DISTASTERS AND CBRNE ATTACKS</b></p> <p>Marco Carbonelli<sup>1</sup> and Laura Gratta<sup>2</sup></p> <p><i>1. Department of Industrial Engineering, University of Rome Tor Vergata (Italy)</i></p> <p><i>2. Risk Management Expert, Italian Public Administration (Italy)</i></p> <p>The authors of this work proposed in the 2012 a first essential method for risk assessment to be applied for the Italian Civil Protection and Civil Defence applications. The here presented Multi-Risk Assessment Method (MRAM), illustrate the complete approach suitable to estimate both impact and risk in</p>

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qualitative, semi-quantitative and, under a more stringent hypothesis, quantitative fashion for catastrophic or calamitous events, including terrorist non-conventional CBRNe attacks.

Drawing inspiration from methods proposed in the USA for Critical Infrastructures protection and for the management of natural disasters, the MRAM presents the following characteristics:

- it applies both natural/anthropic disaster and terroristic attacks (CBRN) to estimate the risk of an event;
- it allows different kinds of risk (all-hazards/threats approach) to be useful for identifying and prioritizing actions and investments in preparedness, protection and resilience of critical areas and critical infrastructures;
- the risk is evaluated by using three mathematical quantities: Threat, Vulnerability and Exposure, where any quantity is evaluated selecting a 'level' on a predefined scales;
- it is scalable and modular on the basis of the application context;
- the method is focused on the safety of the population (fatalities and casualties), although a similar approach can be adopted to estimate even the economic risk;
- it allows to perform the impact analysis for an event by estimating approximatively the number of dead/injured
- logarithm scales are adopted to make easier the interpretation of the results and the management of the method;
- it needs detailed data for quantitative analysis, but less stringent precision is due for qualitative analysis that is oriented to the 'order of magnitude' approach in the results;
- risk formula is oriented to a very fast-run application of the method both for political decisions and technical one, in general used for DSS applications.

PO.2.24

### HOW MACROECONOMIC DETERMINANTS AFFECTING COMMERCIAL BANKS NON-PERFORMING LOAN IN ETHIOPIA COMMERCIAL BANK

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The accumulation of non-performing loans is apt to hinder economic growth. This is why the determination of the explanatory factors for non-performing loans is necessary. It represents an important step not only for the identification of banks with higher non-performing loans, but also to assist the authorities in the implementation of preventive measures against crises and vulnerable situations. Exploring the determinants of higher NPLs is, therefore, an important step for financial stability. The current study attempted to ascertain determinants of NPLs. As well as to investigate and verify the effectiveness of common determinants of commercial banks nonperforming loan and how they affect the level of NPL of twelve commercial banks in Ethiopia based on panel data analysis on the time period from 2009 to 2016. Seven variables (four banks specific and three macro-economic determinants) affecting commercial banks NPL were chosen and analyzed. Firstly, this study examines what explains a higher NPLs by dividing sample banks into two groups, namely, a bank with higher NPLs (classes  $NPL \geq 5\%$ ) and without higher NPL (classes  $NPL < 5\%$ ). Secondly, the study tries to explain the determinants of the level (statuses) of higher NPLs (classes  $NPL \geq 5\%$ ). The data was analyzed by using the double hurdle regression model. For the purpose of analysis, Stata version 13 was used. The model was tested for whether determinants of probability of registering a higher NPL and the level of a higher NPL ratio at time t determined jointly or that the factors affecting each process are different. The results suggest that the probability of registering a higher NPL and the level of a higher NPL ratio at time t appear to be explained by different processes. GDP seem to have a mixed effect on both the probability and intensity of a higher NPL. While the probability of banks registering a higher NPL is influenced by ROA, capital adequacy ratio, loan to deposit ratio, lending rate and GDP, intensity of NPL is determined by ROA, ROE, capital adequacy ratio and GDP.

The study findings suggest that that banks need to seriously consider all the internal and external factors causing non-performing loans as well as the impact of non-performing loans on the bank's overall performance in order to curtail the level of nonperforming loan. Unfortunately, this implies that major changes in level of nonperforming loan will require attention to all of these factors, because no single factor is controlling enough to be used single-handedly as a major policy leverage instrument.

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**PO.2.25**

**DEVELOPMENT OF DELIBERATION-BASED ORGANIZATIONS FOR CONSENSUS IN RURAL CENTRAL JAVA, INDONESIA**

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This research provides information to the general public and especially to the world stakeholders of the organization about the relationship between the implementation of strategic management which consists of vision, mission, strategy, tactics, and efforts in organizations in rural Central Java, Indonesia with five basic values contained in deliberation to reach consensus as the basis of the Indonesian state, namely godly, humanitarian, unity, social, and social justice values. The scope of the research is to discuss the implementation of strategic management consensus with strategic factor is limited by the vision, mission, strategies, tactics, and efforts in relation to the values of deity, humanity, Indonesian unity or nationalism, democracy or deliberation for consensus, and social justice or mutual cooperation. This study is also limited by the application of a humanitarian strategy that fair and sincere faith through the faith of love and hope; a strategy that unites Indonesia in repentance, charity, prayer increases gratitude, sincerity and blessing; community-based management led by Wisdom in Consultation / Representation through education, economics, law in the family, community and nation. This research is also limited by the management of social justice for all Indonesians through openness, togetherness, harmony and sustainability. Furthermore, this study is limited by the location of the study in Purbalingga, Central Java, Indonesia. Mei 2020.





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