

## MIT Open Access Articles

### *Solar System Interiors, Atmospheres, and Surfaces Investigations via Radio Links: Goals for the Next Decade*

The MIT Faculty has made this article openly available. **Please share**  
how this access benefits you. Your story matters.

**Citation:** Asmar, Sami, Preston, R. A., Vergados, P., Atkinson, D. H., Andert, T. et al. 2021. "Solar System Interiors, Atmospheres, and Surfaces Investigations via Radio Links: Goals for the Next Decade." *Bulletin of the AAS*, 53 (4).

**As Published:** 10.3847/25c2cfeb.9d29ef85

**Publisher:** American Astronomical Society

**Persistent URL:** <https://hdl.handle.net/1721.1/145284>

**Version:** Final published version: final published article, as it appeared in a journal, conference proceedings, or other formally published context

**Terms of use:** Creative Commons Attribution 4.0 International license



**Massachusetts Institute of Technology**

# Solar System Interiors, Atmospheres, and Surfaces Investigations via Radio Links: Goals for the Next Decade

**Sami Asmar<sup>1</sup>, R. A. Preston<sup>2</sup>, P. Vergados<sup>2</sup>, D. H. Atkinson<sup>2</sup>, T. Andert<sup>3</sup>,  
H. Ando<sup>4</sup>, C. O. Ao<sup>2</sup>, J. W. Armstrong<sup>2</sup>, N. Ashby<sup>5</sup>, J.-P. Barriot<sup>6</sup>,  
P. M. Beauchamp<sup>2</sup>, D. J. Bell<sup>2</sup>, P. L. Bender<sup>7</sup>, M. Di Benedetto<sup>8</sup>,  
B. G. Bills<sup>2</sup>, M. K. Bird<sup>9</sup>, T. M. Bocanegra-Bahamon<sup>2</sup>, G. K. Botteon<sup>2</sup>,  
S. Bruinsma<sup>10</sup>, D. R. Buccino<sup>2</sup>, K. L. Cahoy<sup>11</sup>, P. Cappuccio<sup>8</sup>,  
R. K. Choudhary<sup>12</sup>, V. Dehant<sup>13</sup>, C. Dumoulin<sup>14</sup>, D. Durante<sup>15</sup>,  
C. D. Edwards<sup>2</sup>, H. M. Elliott<sup>2</sup>, T. A. Ely<sup>2</sup>, A. I. Ermakov<sup>16</sup>, F. Ferri<sup>17</sup>,  
F. M. Flasar<sup>18</sup>, R. G. French<sup>19</sup>, A. Genova<sup>8</sup>, S. J. Goossens<sup>20</sup>, B. Häusler<sup>3</sup>,  
R. Helled<sup>21</sup>, D. P. Hinson<sup>22</sup>, M. D. Hofstadter<sup>2</sup>, L. Iess<sup>8</sup>, T. Imamura<sup>23</sup>,  
A. P. Jongeling<sup>2</sup>, Ö. Karatekin<sup>13</sup>, Y. Kaspi<sup>24</sup>, M. M. Kobayashi<sup>2</sup>,  
A. Komjathy<sup>2</sup>, A. S. Konopliv<sup>2</sup>, E. R. Kursinski<sup>25</sup>, T. J. W. Lazio<sup>2</sup>,  
S. Le Maistre<sup>13</sup>, F. G. Lemoine<sup>18</sup>, R. J. Lillis<sup>16</sup>, I. R. Linscott<sup>26</sup>,  
A. J. Mannucci<sup>2</sup>, E. A. Marouf<sup>27</sup>, J.-C. Marty<sup>10</sup>, S. E. Matousek<sup>2</sup>,  
K. Matsumoto<sup>28</sup>, E. M. Mazarico<sup>18</sup>, V. Notaro<sup>8</sup>, M. Parisi<sup>2</sup>, R. S. Park<sup>2</sup>,**

**M. Pätzold<sup>9</sup>, G. G. Peytavi<sup>3</sup>, M. P. Pugh<sup>2</sup>, N. O. Rennó<sup>29</sup>, P. Rosenblatt<sup>14</sup>,  
D. Serra<sup>30</sup>, R. A. Simpson<sup>31</sup>, D. E. Smith<sup>11</sup>, P. G. Steffes<sup>32</sup>, B. D. Tapley<sup>33</sup>,  
S. Tellmann<sup>9</sup>, P. Tortora<sup>34</sup>, S. G. Turyshev<sup>2</sup>, T. Van Hoolst<sup>13</sup>,  
A. K. Verma<sup>35</sup>, M. M. Watkins<sup>2</sup>, W. Williamson<sup>2</sup>, M. A. Wieczorek<sup>36</sup>,  
P. Withers<sup>37</sup>, M. Yseboodt<sup>13</sup>, N. Yu<sup>2</sup>, M. Zannoni<sup>34</sup>, M. T. Zuber<sup>11</sup>**

<sup>1</sup>Jet Propulsion Laboratory, California Institute of Technology, <sup>2</sup>JPL,

<sup>3</sup>Universität der Bundeswehr München, Germany, <sup>4</sup>Kyoto Sangyo University,

<sup>5</sup>National Institute of Standards & Technology, <sup>6</sup>Observatoire Géodésique de Tahiti,

<sup>7</sup>University of Colorado, <sup>8</sup>Università di Roma, Italy, <sup>9</sup>Universität zu Köln, Germany,

<sup>10</sup>Centre National d'Etudes Spatiales, France, <sup>11</sup>Massachusetts Institute of Technology,

<sup>12</sup>Space Physics Lab., VSSC, Trivandrum, India, <sup>13</sup>Observatoire Royal de Belgique,

<sup>14</sup>Université de Nantes, France, <sup>15</sup>Università di Roma (Sapienza), Italy,

<sup>16</sup>University of California, Berkeley, <sup>17</sup>Università degli Studi di Padova, Italy,

<sup>18</sup>NASA/Goddard Space Flight Center, <sup>19</sup>Wellesley College,

<sup>20</sup>NASA/Goddard Space Flight Center and University of Maryland,

<sup>21</sup>Universität Zürich, Switzerland, <sup>22</sup>SETI Institute, <sup>23</sup>The University of Tokyo, Japan,

<sup>24</sup>Weizmann Institute of Science, Israel, <sup>25</sup>PlanetIQ, Inc., <sup>26</sup>Stanford University,

<sup>27</sup>San Jose State University, <sup>28</sup>National Astronomical Observatory of Japan,

<sup>29</sup>University of Michigan, <sup>30</sup>Università di Pisa, Italy, <sup>31</sup>SETI Institute and Stanford University,

<sup>32</sup>Georgia Institute of Technology, <sup>33</sup>The University of Texas at Austin,

<sup>34</sup>Università di Bologna, Italy, <sup>35</sup>University of California, Los Angeles,

<sup>36</sup>Observatoire de la Côte d'Azur, France, <sup>37</sup>Boston University

**Published on:** Mar 18, 2021

**License:** [Creative Commons Attribution 4.0 International License \(CC-BY 4.0\)](#)

Radio science goals for next decade: technological advances for small spacecraft with capabilities that approximate full-scale spacecraft to enable scientific breakthroughs in atmospheric dynamics, interior structures, and surface properties. New techniques can enable all solar system missions to benefit from enhanced low-cost science capability.



[Solar System Interiors, Atmospheres, and Surfaces  
Investigations via Radio Links: Goals for the Next Decade](#)

1.54  
MB