

INSIGHTS



LETTERS

Attendees socialize during a networking session at the 2023 AAAS meeting in Washington, DC.

NEXTGEN VOICES

The future of scientific societies

AAAS (the publisher of *Science*) turns 175 years old this year. AAAS's mission is to advance science, engineering, and innovation throughout the world for the benefit of all. To celebrate this milestone and explore AAAS's anniversary theme of "igniting progress for the next 175," we asked young scientists, **"How have scientific societies affected your career, and how can societies best support scientists in the future?"** Read a selection of the responses here. Follow NextGen Voices on Twitter with hashtag #NextGenSci. —Jennifer Sills

Inclusion

Scientific societies have given me the opportunity to attend events, enter contests, and start a science communication project. Ensuring more representation of neurodivergent researchers and other minorities in scientific societies is what drives me, as an autistic researcher, to pursue my goals. Scientific societies' most important role in the future will be inclusion. When scientific

societies care about sharing the work and struggles of Black, LGBTQIA+, female, neurodivergent, and other underrepresented researchers, they create a more welcoming scientific community, which will encourage more individuals in minority groups to become scientists.

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Participating in meetings held by national scientific societies, such as the American Geophysical Union and the American Association of Geographers, has allowed me to better understand the research dynamics in my field and helped me to identify emerging research areas. In the future, I hope that the economic barriers to attending annual meetings will be lower. Scientific societies could work to reduce social disparities by providing equal access to science and providing pathways for members of historically underrepresented groups to access the resources required to pursue a scientific career.

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As a first-generation, female, non-European academic, I did not benefit from participating in societies in my field for personal development, but joining the Global Young Academy (GYA) has provided me with a sense of belonging. The GYA connects and mobilizes young scientists from six continents

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PHOTO: ROBB COHEN/PHOTOGRAPHY & VIDEO

to improve the research ecosystem, from working life to public perception of science. Discipline-specific societies cannot support scientists effectively if they function as echo chambers for senior scientists. In the future, scientific institutions will inevitably evolve toward inclusivity, diversity, technological change, and employee-friendly work conditions. The societies that equip scientists with the skills and network to make this transition will play a leading role in catalyzing a better scientific community.

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Reliable information

By publicly presenting the state of the field based on the available science, scientific societies act as a positive force against false premises. My bird and reptile interests led me to join BirdLife Australia and the Australian Society of Herpetologists when I moved to Australia in 2008. These societies provided me with both a community of like-minded people and trustworthy information about taxonomy, species distributions, and ecology that continue to inform my hobbies and research interests today. In a rapidly changing world filled with uncertainty and misinformation, scientific societies' ability to provide reliable, evidence-based information and a sense of community will become increasingly important.

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Scientific societies have allowed me to share my own results and learn about research elsewhere. In a world with information overload and artificial intelligence that can create fake but convincing data, scientific societies disseminate accessible, reliable, and up-to-date information. In the future, society journals should adapt their policies to maximize accessibility and reliability. Research results should be open access. Journals should provide a platform where experts can thoroughly question research results. Publishing peer reviews could help with civility and unfair assessment as well as contribute to the recognition of younger scientists. Societies should also provide more support for preprint publication.

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Social media can be used to voice scientific information but can also expose the public to anti-science movements. The presence of scientific societies on various social media platforms has helped counter misinformation. Such societies have given me the opportunity to engage online with the public as well as resources and guidance to effectively communicate my own research on social media. The involvement of scientific societies on social media platforms will be critical in the future to help build trust in scientific institutions and accurately inform the public.

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Training

Training courses and seminars held by scientific societies can support researchers who want to find practical applications for basic research. I attended a seminar, sponsored in part by the China Association for Science and Technology and the Ecological Society of China, that explained how the agriculture industry can help alleviate poverty. The course provided perspectives from government agencies, businesses, institutions of higher learning, and certification bodies. In the future, applying the results of basic research will be crucial to achieving agricultural production and food and water security. Training organized by scientific societies can help scientists and their partners meet those goals.

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To prepare for the future, scientific societies should take a more active role in anticipating the directions of their field and the needs of trainees and junior scientists. Thanks to their wide-reaching networks, societies have immense but underutilized influence. They therefore have a duty to help implement effective training of younger scientists, especially students of diverse backgrounds and those who can't afford to pay for membership. Societies can help prescribe training plans, research suggestions, or coursework for universities, or they could establish conferences aimed at undergraduates.

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My scientific society, the American Association of Orthodontists, has offered everything from free lunches at annual

scientific sessions to grant funding to career development workshops. Training faculty in the formative stages of their career by offering courses on advancing racial equity, conducting collaborative science, interviewing effectively, networking, handling microaggressions, and leading with sensitivity is one of the most important services societies can offer in the future.

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Global networks

My undergraduate institution had a strong local chapter of the Society for Conservation Biology (SCB). The group connected me to volunteer work, research positions, my honors thesis adviser, and a group of students curious about the same kinds of scientific questions as I was. When the pandemic hit, we kept our SCB chapter alive. Although nothing could replace gathering in person, we found opportunities to hear from remote speakers, hold virtual events, and build an engaging community for students facing unprecedented social isolation. In the future, the most important thing a scientific society can offer to researchers at any career stage will be community. Our increasingly virtual society presents new ways to connect, even with colleagues and peers we have never met face-to-face. In some ways, this virtual shift has revealed weaknesses in these organizations, particularly in accessibility and member diversity. The best scientific societies will find a way to grow, facilitate connections, and adapt with the times to bring their communities together.

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As a Latin American woman working in Europe, I know the barriers scientists face when moving abroad, including creating a collaborative network and building a reputation in a new place. Scientific societies provide opportunities to overcome these challenges. I participated in congresses and served as a junior editorial member in a society-associated journal. I expect scientific societies to maintain an active role in improving the conditions for research and facilitating connections within the scientific community.

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Scientific societies widened my network and strengthened my research skills through mentorship programs. Scientific societies can be a critical tool that links people together across the world, ensuring that knowledge in the field moves forward as a whole. In the future, societies should continue to build bridges in the form of activities between researchers from differing backgrounds and seniority, fostering interaction and connection.

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Funding

Scientific society awards allowed me to take part in international conferences as a PhD student—an unbelievable opportunity for someone from a working-class background with no funding. Scientific progress is challenged by powerful forces, such as economic interests, a culture of competition, and bureaucracy, that influence the direction of research. Scientific societies must fight against these trends by defending the scientific community's right to determine its own path. Supporting early-career researchers and other disadvantaged groups through scholarships and awards would be a step toward that goal.

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Scientific societies organize conferences at which I can share my research, exchange ideas, and network with peers and potential employers. In the future, scientific societies should encourage involvement of early-career researchers to avoid stagnation of ideas and accelerate progress toward diversity. Conferences should be affordable and accessible to researchers from economically disadvantaged areas. Societies can also use their funds and influence to support and reward efforts of science communication and the engagement of researchers with policymakers.

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Entrepreneurship

Six years ago, as a junior majoring in management, my friends and I began

an entrepreneurial project to produce rice and crayfish. When the project almost failed, scientific societies stepped in to help, recommending suppliers of high-quality production materials and providing technical guidance. Inspired by the experience, I am now a PhD student in crop cultivation and agricultural technology. Scientific societies should continue to nurture innovation by supporting entrepreneurship, especially in young scholars.

Hui Xu

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Unlike traditional symposia, scientific societies allow scientists to gain peer recognition, which is a vital incentive for doctoral students at the beginning of their academic career. In the future, scientific societies can serve as key entry points for young scientists to connect with society, experts, and other young people in their field. Scientific societies also have the potential to replace traditional startups in the Internet era, as distributed organizations jointly own and incubate cutting-edge technologies and products.

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Societal solutions

As a PhD student in electrical engineering, I have benefited from the activities of the Institute of Electrical and Electronics Engineers (IEEE) and the Chinese Society for Electrical Engineering. These societies can use their influence to guide the research direction of the engineering industry. For example, the special issues on

low-carbon power systems in IEEE's top journal have driven the field toward research on more sustainable electricity generation, transmission, and consumption. Scientific societies have the responsibility to steer their fields toward environmentally responsible research.

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The research opportunities provided by scientific societies have helped me secure funding and collaborators for research projects on diseases in underserved communities in my conflict-ridden country. I have also received society-sponsored travel awards to attend training courses, workshops, and conferences. However, the role of scientific societies goes beyond member benefits. Scientific societies can promote interdisciplinary and multifaceted solutions to address issues of global concern, including climate change, food security, energy, and emerging health problems, through effective communication, education, technology, collaboration, and science diplomacy.

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When I was an undergraduate researcher in India, scientific societies helped me connect and share my work with other biologists. Societies can also contribute to reforms in the academic community. In the future, societies should integrate more early-career researchers into leadership committees and advocate for scientists with marginalized identities. To advance inclusion while also focusing on the dangers of the planet's survival, scientific societies should collect data and resources showing how scientists can reduce their research carbon footprint. Societies should also commit to organizing sustainable and eco-friendly conferences, including eco-conscious choices for meeting size, frequency, location, transportation, accommodation, food options, and waste mitigation. As we advance toward global change, scientific societies can help adapt institutional policies by fostering green and equitable science.

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Deadline for submissions is 21 April. A selection of the best responses will be published in the 7 July issue of *Science*.



The future of scientific societies

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