Scientific Societies Team Up to Foster a Diverse STEM Workforce

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Scientia

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The Science, Technology, Engineering, and Math (STEM) communities have a long history of exclusion and underrepresentation of women, African American, Latinx, American Indian and LGBTQIA+ students. In order for our STEM enterprise to be truly equitable, everyone that wants to become a scientist must have an equitable opportunity to do so, regardless of their gender, ethnicity or sexual orientation. In the movement toward equity, the demographic diversity of the STEM workforce must mirror that of the general population. STEM workforce diversity can accelerate innovation in scientific disciplines, and, if coupled with systemic cultural equity, can also support a STEM enterprise where everyone can thrive. **Dr Verónica A. Segarra**, Associate Professor at Goucher College, has been exploring how scientific societies could help their disciplines be more equitable. Her efforts have helped to establish numerous alliances and collaborations among societies and diversity-focused organisations, with the mission of building a more diverse and inclusive STEM workforce.

The Crucial Role of Scientific Societies

While some might perceive scientists as solitary individuals who carry out experiments inside a lab, most scientific work is based on collaborations and interactions between different scientists and research groups. For centuries now, these joint scientific efforts have been facilitated by organisations known as scientific societies.

Scientific societies are founded with the mission of supporting and disseminating the work of researchers, scientists, engineers, and other STEM-related professionals. These societies can also help to shape the scientific landscape through the opportunities they offer scientists. For example, societies offer scientists opportunities for professional development, funding, networking, and collaboration.

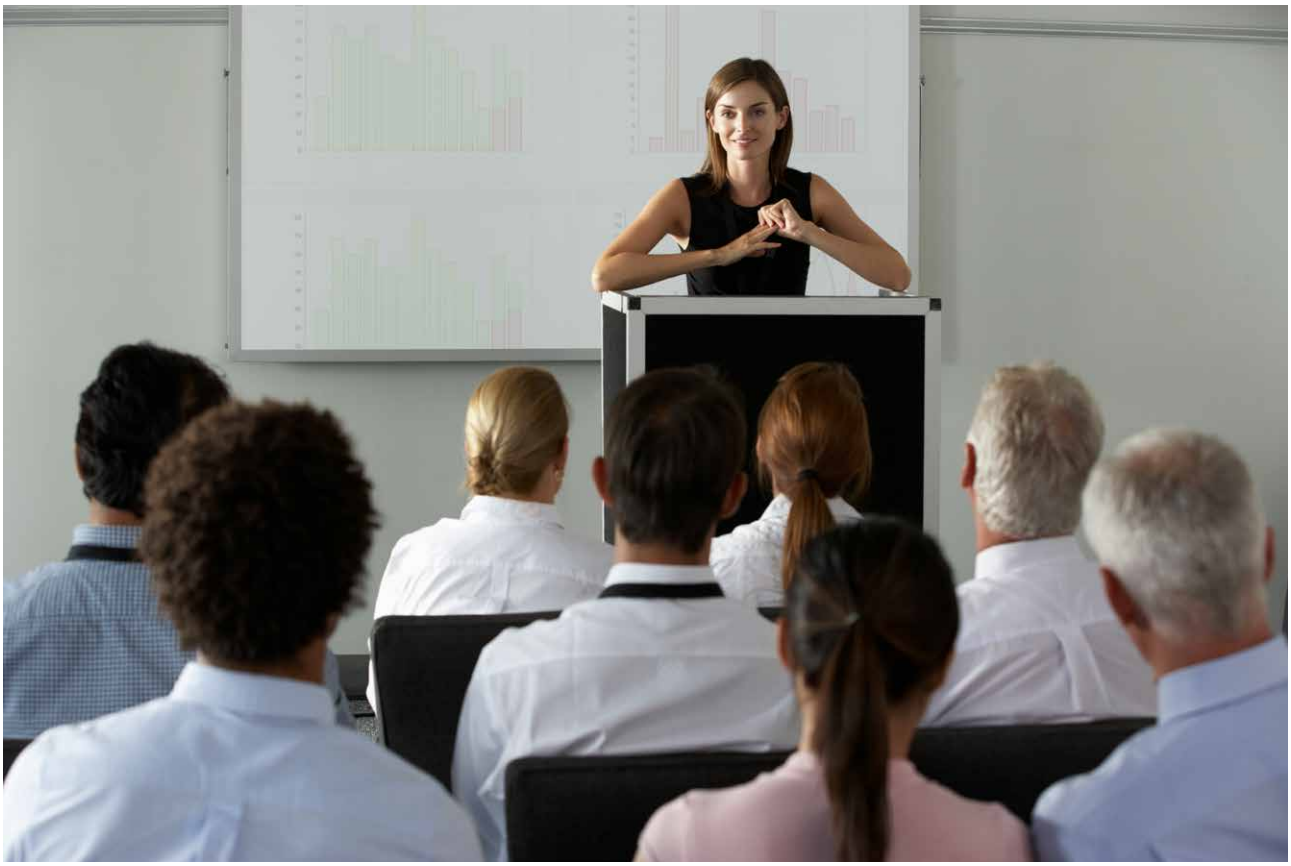
Along with their academic and research endeavours, scientists are often expected to attend conferences and present their work at events hosted by scientific societies. These events bring together practitioners in a specific field to share, learn, and disseminate the latest developments and advancements in the discipline.

By bringing scientists together and supporting their work, scientific societies can be highly influential in the development of specific research fields. For instance, societies determine what research topics are highlighted at events and conferences, providing these areas of research with a greater degree of attention.

Societies can also determine which scientists in their membership are highlighted at the events they host. For example, in hosting events, societies must select scientists from their membership for achievement awards, scientific talks, and guest speaking opportunities.

Encouraging Scientists to Foster Inclusive Environments

In addition to providing opportunities for scientists to present their work and interact with other experts, scientific societies often rely on their members to step up and help to shape their scientific communities in leadership roles. Collectively, these volunteer leaders drive the mission and activities of the society forward by serving on a variety of governing committees and task forces.



In these leadership roles, society members who are trained scientists often take on new roles that connect with the social dynamics of science as a human enterprise. This gives them the power to shape the climate of inclusivity and diversity within the society. These roles include membership recruitment and demographic surveying, designing professional development programming for scientists, and selecting scientific speakers or awardees for conferences and events.

For this reason, society volunteer leaders may receive guidance on how they can best contribute to improving inclusivity in their society and the overall scientific landscape. For instance, they could take part in training or receive resources that outline standard protocols, approaches or strategies to improve inclusivity and minimise bias in their leadership roles. By implementing these strategies, they can help to shape the future of their discipline at large towards being more equitable. Training and resources for society volunteer leaders can only be effective if they reflect what research has shown about the social forces that sculpt science and academia as a human enterprise. In recent years, many scientific societies have started exploring ways in which they could help to increase the efficacy of their diversity, equity, and inclusion efforts by engaging social scientists and other experts in the area of diversity and inclusion, especially scholars who focus on STEM.

Similarly, resources that can help society membership at large to be better equipped to support inclusivity efforts would be most effective if they are based on what scholars have learned from studying inclusive and non-inclusive scientific environments and practices. 'We want to model inclusive practices and steer away from non-inclusive practices,' explains Dr Verónica A. Segarra of Goucher College, a professor who is committed to diversity, equity and inclusion within the STEM community.

Changing How Societies Approach Diversity

Historically, scientific societies have sought to achieve greater diversity in their disciplines and memberships by supporting the professional development of trainees from backgrounds that are underrepresented in STEM. While these efforts and initiatives are important and have successfully contributed to the growth and development of individual scientist trainees, individual-based strategies have failed to result in widespread and systemic change.

In order to achieve widespread change in making STEM disciplines more inclusive, societies should ideally work closely together to learn from each other about challenges and approaches that are effective, implementing evidence-based promising strategies that encourage the pervasive and long-lasting transformation of scientific communities.

Collectively, scientific societies can help to shape numerous different aspects of science, including the overall STEM workforce and the general direction of a given research field. This can be achieved through advocacy and

outreach efforts, as well as by developing and disseminating sustainable inclusive practices and strategies for scientific societies.

In recent years, Dr Segarra has been investigating ways in which scientific societies can join forces to increase diversity and inclusion in STEM. Her work has led to numerous important initiatives, programs, and collaborations.

The Alliance to Catalyze Change for Equity in STEM Success (ACCESS)

In 2017, Dr Segarra and her colleagues established ACCESS: the Alliance to Catalyze Change for Equity in STEM Success. This meta-organisation, supported by the US National Science Foundation (NSF), brings together representatives from the diversity-focused committees of different scientific societies in the life sciences.

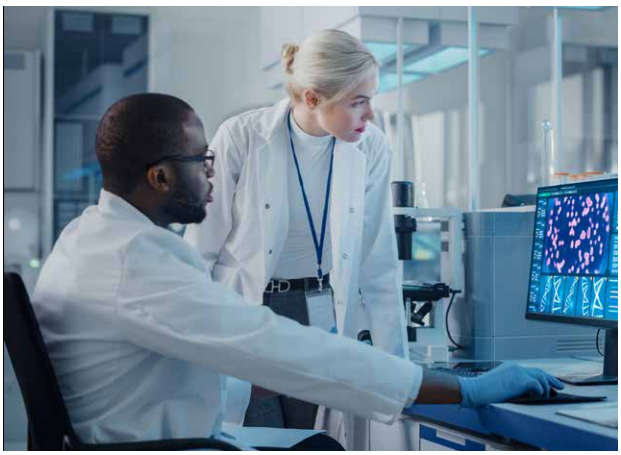
ACCESS societies meet regularly to coordinate and disseminate their efforts to advance inclusive practices within their fields. For example, in 2020, ACCESS examined closely the practices associated with the travel award programs of various scientific societies. These programs offer travel support to scientists from underserved groups or those working at underserved institutions, to allow them to attend conferences and other events organised by scientific societies, which they would otherwise miss out on.

As a result of this work, ACCESS has outlined and published a series of peer-reviewed recommendations for improving society inclusivity through travel award program implementation. Similar recommendations have been published by ACCESS in the areas of scientific speaker selection, program assessment, and undergraduate scientist engagement.

Most recently, ACCESS, in collaboration with others, received funding to expand its reach to additional areas in STEM beyond the life sciences. This new program, called the ACCESS+ initiative, aims to accelerate the adoption of policies and practices that have been developed from years of research on gender-related diversity, equity, and inclusion change strategies, by coordinating and integrating efforts of STEM professional societies. The ACCESS+ initiative includes partner organisations such as the NSF INCLUDES Alliance: National Alliance for Inclusive and Diverse STEM Faculty and the Women in Engineering ProActive Network (WEPAN).

Persistent Challenges Affecting Scientific Societies

In another NSF-funded project, Dr Segarra and her ACCESS colleagues plan to establish a collaborative network of experts that will identify evidence-based strategies for fostering inclusivity and diversity within scientific societies and the STEM community as a whole. Towards this aim, the collaboration plans to generate community standards for effectively



collecting demographic data on society memberships, to better integrate scientists in transitional career stages into society activities, and to diversify the ranks of society leaders.

By fulfilling these three goals, this project aims to overcome persistent challenges that often undermine diversity efforts within scientific societies, and to widely share this information for the benefit of all STEM communities.

Collaborating organisations on this project include the Quality Education for Minorities Network, the NSF INCLUDES Alliance: National Alliance for Inclusive and Diverse STEM Faculty, and the Marine Biological Laboratory at Woods Hole, Massachusetts.

Innovative Ways to Build a Diverse STEM Landscape

Despite many decades of efforts, underrepresentation and exclusion of certain groups in the STEM workforce continues to be a persistent challenge. Therefore, in order to transform the STEM workforce into a diverse and equitable community, we need to find new ways to build upon these past efforts.

'Are we leveraging scientific societies as change agents to effectively create inclusive environments in STEM?' asks Dr Segarra. 'While scientific societies can play a key role in transforming STEM disciplines, widespread, systemic, and long-lasting change can only be achieved through collective efforts and alliances that transcend or go beyond supporting the professional development of individuals who belong to underrepresented groups in STEM.'

The recent work by Dr Segarra is an example of how groups of scientists are experimenting with ways to leverage their scientific societies to have a more profound and collective impact in the interest of diversity and inclusivity in their fields. As they continue working to find new ways in which scientific societies can build a more inclusive STEM workforce, Dr Segarra and her colleagues hope to involve an increasing number of stakeholders, including additional societies and scholars, to further enhance the impact of their initiatives and promote long-term positive change.

Meet the researcher

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Dr Verónica A. Segarra is currently Associate Professor and the Maryland E-Nnovation Endowed Chair in Biological Sciences and Chemistry at Goucher College, a small liberal arts college in Baltimore, MD. She holds a PhD and an MPhil in Molecular Biophysics and Biochemistry from Yale University, as well as a BSc in Biochemistry from the University of Miami. Before she started working at Goucher College, she was an Assistant Professor of Biology and Interim Chair at High Point University, a Visiting Assistant Professor at Rollins College in Florida for one year and a Postdoctoral Associate for Sandra K. Lemmon's Laboratory at the University of Miami Miller School of Medicine. Dr Segarra has received many grants, honours and awards, including the Inaugural Innovation and Creativity in Teaching and the Outstanding Collaborator Awards from High Point University. In addition to her academic and research work, Dr Segarra is part of several committees, councils, and editorial boards. From 2021, she has served as an Editor for *Frontiers in Sociology, Frontiers in STEM Education, eBio*, and *Molecular Biology of the Cell*. In addition to conducting biology research, she has been exploring new frontiers in STEM education, particularly focusing on diversity, minority groups, and on effectively supporting individuals who are pursuing careers in STEM-related fields.

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FUNDING

US National Science Foundation
US National Institutes of Health

ACCESS
Alliance to Catalyze Change for Equity in STEM Success

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