

Reimagining STEMM Graduate Education and Postdoctoral Career Development: A Summit

July 22-23, 2025

National Academies of Sciences Building, Washington, DC
Kavli Auditorium and Online

TUESDAY, JULY 22, 2025 (EDT)

8:00-9:00AM Breakfast

9:00-9:25AM Welcome and Overview of Day One

Speakers:

- **Julie Posselt**, Associate Dean of the Graduate School and Professor of Education - *University of Southern California***
- **Joerg Schlatterer**, Director of the Office of Research Grants - *American Chemical Society***
- **Marcia McNutt**, President - *National Academy of Sciences*
- **Cynthia M. Friend**, President and CEO - *The Kavli Foundation*

9:25-10:15AM Opening Keynote: What is the Current Landscape of Postgraduate STEMM Career Development?

Moderator: **Dan Pomeroy**, Executive Director – *Scientific Citizenship Initiative*

Speaker: **Donna K. Ginther**, Director, Institute for Policy & Social Research - *University of Kansas*

The current approaches to STEMM graduate education and postdoctoral career training are complex and highly ingrained in the STEMM research ecosystem. Before we can imagine new paths forward, we need to understand both where we are and how we got here. This session will provide an overview of postgraduate STEMM career development, including the long-standing economic incentive structures that brought us to the current landscape.

10:15-10:30AM Break

10:30-11:50AM What are Graduate Students Currently Experiencing in the United States?

Moderator: **Priyanka Bushana**, 2025 Mirzayan Science & Technology Policy Fellow - *National Academies*

Speakers:

- **Beatrice "Bia" Caffè**, UAW 4591 president and Graduate Research and Teaching Assistant in Anthropology - *Washington State University*
- **Don Dixon**, Postdoctoral Researcher in Astronomy – *Vanderbilt University*
- **Alyssa Paparella**, Founder of DisabledInSTEM and HHMI Gilliam Fellow in Cancer and Cell Biology - *Baylor College of Medicine*
- **Alex Rich**, Graduate Student - *Yale School of Medicine*

The rigor of graduate education in the United States produces great intellectual growth and, in many cases, significant personal and professional stress. In their pursuit of highly specialized skills, knowledge, and recognition, graduate students often navigate unclear career pathways, unstable funding, uneven access to mentorship, and inconsistent institutional support. Many graduate students also receive low stipends and experience financial burdens that make it difficult to meet basic needs such as housing and healthcare. Recent instabilities in STEMM

research and educational funding will continue to exacerbate these stressors and may diminish the likelihood or ability of current and future graduate students to complete their studies.

Complementing the opening keynote, this session will discuss some of the structural and cultural factors that shape the graduate student experience, including wellbeing and mental health. The panelists will explore ways to reimagine that experience, how unionization and other collective organizing mechanisms have impacted graduate students' working conditions, and ability to pursue institutional change.

11:50AM-12:45PM **Lunch**

12:45-2:00PM **What if We Coordinated Programs and Resources to Improve Graduate Education?**

Moderator: **Lorelle Espinosa**, Program Director for STEM Higher Education - *Alfred P. Sloan Foundation*

Speakers:

- **Julia Kent**, Vice President, Best Practices and Strategic Initiatives - *Council of Graduate Schools*
- **Sara Xayarath Hernandez**, Associate Dean for Inclusion and Student & Faculty Engagement for the Graduate School – *Cornell University*; Liaison Community Coordinator - *Equity in Graduate Education Consortium*
- **Corrie Kuniyoshi**, PI of Impact Indicators and Instruments for IDPs, Senior Portfolio Manager - *American Chemical Society*

Change in U.S. graduate education system will be accomplished by reaching all or most of the system and not just a portion of it. Accordingly, several groups and organizations are leading multi-sector, multi-institutional initiatives to coordinate improvements. Their overall goal is to enhance access to and experiences in graduate education, often through institutional change efforts that include a wide range of parties including academic institutions, the private sector, non-governmental organizations, government agencies, informal science organizations, and more. Some programs also aim to provide resources to ensure that graduate education better aligns with current STEMM workforce needs. However, resources and strategies must be coordinated for efforts to be sustainable and broadly accessible.

This panel will discuss lessons from several successful efforts to coordinate improvement across universities and graduate programs and consider what it would take to consolidate gains from successful innovations in STEMM graduate education.

2:00-2:15PM **Break**

2:15-3:45PM **What if We Consciously Prepared Early Career Scholars for a Variety of Careers?**

Moderator: **Emily Miller**, Vice President of Research and Institutional Policy - *Association of American Universities*

Speakers:

- **Cynthia Fuhrmann**, Principal Investigator of Professional Development Hub and Associate Professor of the RNA Therapeutics Institute - *University of Massachusetts Chan Medical School*
- **Ashley Moses**, Ph.D. Student and Founder of PhD Paths - *Stanford University*
- **Roman Holowinsky**, Associate Professor of Mathematics (on leave) - *The Ohio State University*; Managing Director and Cofounder - *The Erdos Institute*
- **Phil Trella**, Associate Vice Provost and Director of the Office of Graduate and Postdoctoral Affairs - *University of Virginia*

Early-career STEMM professionals are needed in a wide array of careers essential to the scientific enterprise, economy, and society. Most Ph.D.-trained STEMM professionals will leave academia after acquiring their graduate

degrees; however, few are trained for or even exposed to non-academic career options. This session brings together representatives of efforts to support diverse career pathways in STEM and reimagines professional development for STEM trainees by asking: How can we consciously approach full-spectrum professional skill development for graduate students and postdoctoral researchers? What are the barriers to addressing professional development needs? And what tools are currently being employed to meet the professional development needs of trainees?

3:45-5:00PM What if We Learned from Current Graduate Education and Postdoctoral Training Systems outside of the United States?

Moderator: **Rigoberto Hernandez**, Gompf Family Professor in the Department of Chemistry - *Johns Hopkins University*

Speakers:

- **Thomas Busch**, Dean of Graduate School and Professor - *Okinawa Institute of Science and Technology*
- **Florent Bernard**, Counsellor for Research and Innovation - *Delegation of the European Union to the United States*
- **Chris Turner**, Head of Collective Talent Funding – *UKRI*

The time is right for a serious exploration of alternative visions for how to design postgraduate STEM career development. Many of the problems of graduate education and postdoctoral training discussed during this summit are not unique to training within the U.S. However, other countries have developed robust solutions for these problems, are actively working in novel ways to address them, or have designed their systems to reduce the salience of these challenges.

This panel surveys features leaders of, and effective practices employed by, graduate education and postdoctoral training systems outside of the United States. The goal of the discussion is to surface promising practices that could potentially innovate and improve STEM graduate education and postdoctoral training in the United States.

5:00-5:30PM Closing: What if We Developed New Approaches to Financing Graduate Education in the United States?

Speakers:

- **Victor McCrary**, Vice President for Research and Professor of Chemistry - *University of the District of Columbia*; Interim Chair - *National Science Board*
- **Darryll Pines**, President - *University of Maryland, College Park*

5:30PM Adjourn Day One

WEDNESDAY, JULY 23, 2024 (EDT)

8:00-9:00AM Breakfast

9:00-9:10AM Welcome and Overview of Day Two

Speakers:

- **Julie Posselt**, Associate Dean of the Graduate School and Professor of Education - *University of Southern California***
- **Joerg Schlatterer**, Director of the Office of Research Grants - *American Chemical Society***

9:10-10:00AM Keynote: What are the Impacts of the Current Administration Changes on Graduate and Postdoctoral Training in the United States?

Speakers:

- **Bryan Alexander**, Senior Scholar and Adjunct Professor - *Georgetown University*
- **Suzanne Barbour**, Dean of the Graduate School and Vice Provost for Graduate Education - *Duke University*

Policies proposed and implemented by the current administration, as well as new regulatory structures like executive actions, have suddenly and dramatically affected graduate education and postdoctoral training, with more impacts likely to come. During this fireside chat, futurist Bryan Alexander and Dean Suzanne Barbour will review the most salient impacts in the first half of 2025, reimagine how institutions of higher education will engage with the federal government going forward, and anticipate how these evolving relationships will influence graduate students and postdoctoral scholars in the United States.

10:00-10:15AM Break

10:15-11:45AM What if International Students and Postdoctoral Scholars Stopped Coming to the United States?

Moderator: **Chris Glass**, Professor of the Practice - *Boston College*; Affiliated Faculty - *Center for International Higher Education (CIHE)*

Speakers:

- **Michael A. Clemens**, Professor of Economics - *George Mason University*
- **Sonali Majumdar**, Assistant Dean for Professional Development, GradFUTURES - *Princeton University*
- **Allan Goodman**, President Emeritus - *Institute of International Education*
- **Tim Kodalle**, Postdoctoral Fellow - *Berkeley Lab*

The U.S. higher education system has long served as a powerful magnet for international talent, attracting some of the world's brightest minds to contribute to the STEMM enterprise. Consequently, the U.S. STEMM workforce has come to be dependent on the unique skills, perspectives, and knowledge of immigrants. With increasing visa restrictions and declining prospects for permanent residency, however, the U.S. risks losing talent developed by domestic STEMM trainee programs.

This panel reimagines the U.S.'s future STEMM enterprise by asking: What if international students and postdoctoral scholars stopped coming to the United States? How does this contribute to the concept of "global brain circulation"? What could we do to mitigate the risk of this reality? And what are we doing at present to retain U.S.-trained talent?

11:45AM-12:45PM Lunch

12:45-2:00PM What if We Restructured the Postdoctoral Career Stage in the United States?

Moderator: **Stefano Cataldi**, Associate Research Scientist - *Columbia University*

Speakers:

- **Gary McDowell**, CEO and Founder - *Lightoller LLC*
- **Tom Kimbis**, Executive Director and CEO - *National Postdoctoral Association*
- **Elza Rechtman**, Instructor and Executive Board Member— *Mount Sinai and Columbia Postdoctoral Workers Union (UAW Local 4100)*
- **Chanele Polenz**, Chair - *Canadian Association of Postdoctoral Scholars*
- **Keith Micoli**, Associate Dean of Postdoctoral Affairs - *New York University Langone Health*

Postdoctoral positions have become a nearly universal stage on career pathways for STEMM researchers, yet the postdoctoral experience remains ill-defined, weakly structured, and poorly understood. Selection mostly occurs through faculty networks. As a result, while the postdoctoral position is intended to provide advanced training, evaluation, and professional development, postdoctoral roles also can involve low pay, insecure employment, unclear expectations, and few opportunities for career development. Many postdoctoral scholars face structural and personal challenges, including mentorship quality, work-life balance, immigration concerns, and difficulty transitioning to permanent positions. To address these and related concerns, several recent reports, institutional initiatives, and grassroots advocacy movements have suggested actions to improve postdoctoral policies, support systems, and labor conditions.

A successful postdoctoral fellowship may have many outcomes. This panel will reimagine the role of postdoctoral scholars in the United States, with panelists discussing their personal experiences, visions for the future, and ongoing efforts towards meaningful change.

2:00-3:30PM What if Industry Had an Active Role in Supporting Academic Career Development?

Moderator: **Lee Ellen Drechsler**, Senior Vice President - *Procter & Gamble*

Speakers:

- **Kenneth A. Olliff**, Former Senior Vice President for Strategy & Innovation - *Boston University*
- **Ingrid Montes**, Professor of Chemistry - *University of Puerto Rico*
- **Rhonda Sutton**, Assistant Dean for Professional Development, Accelerate to Industry (A2i) - *North Carolina State University*
- **Kristina Thorsell**, *Independent Consultant*

Industry has long depended on academia, benefiting both from nascent innovations born in academic research laboratories and the ability to hire Ph.D.-trained STEMM professionals. Economic instabilities in STEMM funding and attendant challenges of funding Ph.D. students and postdoctoral scholars directly affect this relationship. Although traditional views focus on conflicts of interest and questions about intellectual property management or portray STEMM careers as confined to either industry or academia, designing collaborations with industry in professional development is becoming increasingly essential. Conversations that include and address the concerns of all parties are essential in shaping current and future graduate students and postdoctoral scholars for their careers, especially as a majority of trainees will embark on career paths outside of academia.

This panel aims to reimagine core competencies that could be developed during postgraduate STEMM career stages to best interface with industry, as well as the roles and responsibilities of industry in supporting the development of those competencies. This discussion will cover both the challenges and opportunities associated with models of collaboration and funding.

3:30-4:00PM Closing Remarks

Speakers:

- **Julie Posselt**, Associate Dean of the Graduate School and Professor of Education - *University of Southern California***
- **Joerg Schlatterer**, Director of the Office of Research Grants - *American Chemical Society***

4:00PM Adjourn Day Two

*All times U.S. Eastern

**Co-Chair of the Reimagining STEMM Graduate Education and Postdoctoral Career Development Planning Committee