

# The Future of Science

College of Science  
Thought Leaders Forum

MARCH 7, 2022  
MEMORIAL UNION BALLROOM  
CORVALLIS, OREGON

COLLEGE OF SCIENCE  
EVENT PROGRAM



**Oregon State**  
University



# Welcome

Welcome to the Future of Science Thought Leadership Forum. We are glad you could join for this exciting opportunity to engage together in deliberative dialogue as we contemplate the future of the College of Science.

This forum is an opportunity to add insights from experts from outside Oregon State to the College of Science's 2022-2027 strategic plan, as well as hear from you on the topics our guests will discuss. Our strategic plan will be a collective vision and include elements from our diversity action plan and Oregon State's Strategic Plan 4.0. It will be data-informed, equity-minded and community-engaged.

Thank you for investing in the College of Science's future. Your voice is important and critical to advancing our mission of research, education and inclusive excellence and ensuring a better Future of Science for everyone!

**Roy Haggerty**

Dean, College of Science

**Vrushali Bokil**

Chair, Strategic Planning Committee

Associate Dean for Research and Graduate Studies

# Agenda

## **Morning session**

- 8:00 a.m. Breakfast
- 8:30 a.m. Dean Haggerty introductions of speakers and provost
- 8:45 a.m. Provost Edward Feser welcome
- 9:00 a.m. Laura Greene
- 9:30 a.m. Q&A with Laura Greene
- 9:45 a.m. Break and mingle
- 10:00 a.m. Breakout sessions for COS community
- 11:00 a.m. Rosalyn (Roz) Hobson Hargraves (virtual)
- 11:30 a.m. Q&A with Rosalyn Hargraves (virtual)
- 11:45 a.m. Break and mingle

## **Noon      Lunch**

## **Afternoon session**

- 1:30 p.m. Holden Thorp (virtual)
- 2:00 p.m. Kelvin Droegemeier (virtual)
- 2:30 p.m. Break and mingle
- 2:45 p.m. Q&A with Holden Thorp and Kelvin Droegemeier (virtual)
- 3:15 p.m. Break and mingle
- 3:30 p.m. Breakout sessions for College of Science community
- 4:30 p.m. Strategic planning report out from both sessions
- 5:00 p.m. Happy Hour
- 6:00 p.m. Breakout session for College of Science students
- 7:00 p.m. Event ends





# Laura Greene

Dr. Laura Green is chief scientist at the National High Magnetic Field Laboratory (Florida State University, University of Florida and Los Alamos National Laboratory) and the Marie Krafft Professor of Physics at Florida State University. Dr. Greene is an expert in quantum mechanics known for her discoveries and research in unconventional superconducting materials and high magnetic



fields. She also is a leading advocate for diversity in science and a champion for women in scientific and engineering fields. Dr. Greene is a member of the U.S. National Academy of Sciences and of the President's Council of Advisors on Science & Technology.

**ABSTRACT**

**Future of Materials Research in the U.S. – Domestic and International**

I was a co-chair of the National Academy of Science's "Frontiers of Materials Research, a Decadal Survey" which was designed to enable us to understand, control and expand the material world. On the President's Council of Advisors on Science & Technology, I co-chair an exploratory group entitled "Innovation and Competitiveness" which is no less daunting. There are important overlaps in these two projects that go well beyond specific research directions to be taken.

After a short discussion of the Decadal Survey, I will present ideas that might innovate our national labs and research universities. I will then discuss the importance of regional innovation hubs – all of which would complement each other. In the U.S., it is not just that the funding of basic research as a percentage of the U.S. gross domestic product (GDP) has fallen dramatically, but how we use our federal research dollars will make a big difference. International collaboration must also play a crucial role.



# Rosalyn Hargraves

Dr. Rosalyn (Roz) Hobson Hargraves is division director for the Division of Undergraduate Education in the NSF Directorate for Education and Human Resources, which works to strengthen STEM education at two- and four-year colleges and universities.

Dr. Hargraves is a Professor of Electrical and Computer Engineering at Virginia Commonwealth University (VCU). In addition to STEM education, Dr. Hargraves' research interests also include diversity, equity and inclusion in higher education, machine learning,

biomedical signal and image processing, and the role of science and technology in international development.

Dr. Hargraves has consulted with private industry in the area of machine learning and co-founded a start-up, SPT (Signal Processing Technologies), based upon her research in biomedical image processing. She has been awarded sponsored research grants totaling over \$25M from federal, state, foundation and industrial sources primarily in the area of STEM education and training. Her professional service has included membership on two National Academies Committees, and she currently is elected to serve on the American Council on Education Council of Fellows board, the Bon Secours Richmond Health System Board and as a Richmond Memorial Health Foundation Trustee. She received her Bachelor's, Master's and Doctorate degrees in electrical engineering from the University of Virginia.

#### ABSTRACT

### Advancing Access, Equity, Innovation and Excellence in Undergraduate STEM Education: Programs in the NSF Division of Undergraduate Education

The National Science Foundation Division of Undergraduate Education's mission is to promote excellence in undergraduate science, technology, engineering and mathematics (STEM) education for all students. DUE's current programs constitute a comprehensive approach to strengthening STEM education at two-and four-year colleges and universities by improving curricula, instruction, laboratories, infrastructure, assessment, diversity of students and faculty, and collaborations. An overview of the National Science Foundation's priorities, the proposed new NSF directorate, and all of DUE's programs will be discussed.





# Holden Thorp

Dr. Holden Thorp has been editor-in-chief of the Science family of journals since 2019. He is the Rita Levi-Montalcini Distinguished University Professor at Washington University and holds appointments in chemistry and medicine. He served as the university's provost from 2013 to 2019. He joined Washington University after spending three decades at the

University of North Carolina at Chapel Hill (UNC), where he served as the university's 10th chancellor from 2008 through 2013. He is a fellow of the American Academy of Arts and Sciences, the National Academy of Inventors and the American Association for the Advancement of Science.

Dr. Thorp is the co-author, with Buck Goldstein, of two books on higher education: "Engines of Innovation: The Entrepreneurial University in the Twenty-First Century" and "Our Higher Calling: Rebuilding the Partnership Between America and Its Colleges and Universities," both from UNC Press.

#### ABSTRACT

### The Future of Science is Both Exciting and Uncertain

It's the best of times and the worst of times in science. The best of times because exciting problems like protein folding, pan-coronavirus vaccines, quantum computing and more precise climate modeling are solved or in reach. The worst of times because public skepticism of science continues to increase, and governments are moving to restrict access to higher education and impede the ability of scholars to seek the truth. Balancing all of this will require a savvier approach to communication and more focus on the sociology of science in addition to research.



# Kelvin K. Droegemeier

Dr. Kelvin K. Droegemeier is an American research meteorologist, most recently having served as director of The White House Office of Science and Technology Policy. Dr. Droegemeier is known for his research in predicting the development of extreme weather events, and previously served as Oklahoma Secretary of Science and Technology and the Vice President for Research at the University of Oklahoma. He currently is serving as Regents Professor of Meteorology, Roger and Sherry Teigen Presidential Professor, and Weathernews Chair Emeritus at the University of Oklahoma.



## ABSTRACT

# Peering into the Crystal Ball of America's Research Enterprise: Time to Shake the Etch-a-Sketch

America is blessed with an exceptional and, in many cases, world-leading innovation ecosystem that arose principally following World War II. It consists of a wide array of post-secondary colleges and research universities, career technical schools, federal agencies, which both fund and perform research, federal and national laboratories, non-profit foundations, independent research institutes, research and teaching hospitals, and for-profit corporations.

Countless statistics unequivocally demonstrate the highly productive nature of this enterprise, ranging from the number of Nobel Laureates produced to trillion-dollar companies placing humans in space. Yet these successes come almost in spite of an increasingly self-imposed and stifling regulatory environment, decades-old unresolved challenges involving partnerships among ecosystem sectors, a funding environment increasingly averse to intellectual risk-taking, and models of education and training which, though making progress, are far from achieving the diversification and scale-up required to redress embarrassing underperformance on a global scale and engage all quarters of the nation.

The time, therefore, has come to “shake the Etch-a-Sketch” and be as bold and transformative in our research frameworks and policies as we have been in our ideas to understand the natural world and innovate for the benefit of society. The COVID pandemic is a global use case from which we can draw wisdom. This presentation highlights some possibilities to consider in moving America to an entirely new level of capability across the entire innovation ecosystem.

# Upcoming Events

## International Women's Day

**March 8, 2022, 12:30 – 3 p.m.**

Laura Greene, chief scientist of the National Magnetic Field Laboratory and the Marie Krafft Professor of Physics at Florida State University, will lead a discussion on the state of women in the sciences. Greene is a leading advocate for diversity in science and a champion for women in STEM fields. This event will be held in-person and virtually. Lunch provided.

## Gilfillan Memorial Lecture

**April 2022**

Biologist Michael Freitag will present the 2022 F.A. Gilfillan Memorial Lecture. He was the 2021 recipient of the College of Science's F.A. Gilfillan Memorial Award for Distinguished Scholarship in Science for his outstanding contributions to research in biology. More details to come soon.

## Dam Proud Day

**April 27, 2022**

Dam Proud Day is Oregon State University's annual day of giving. Join other faculty, students, parents, alumni and friends as we support undergraduate research, scholarships and the biochemistry and biophysics department.



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