The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Board on Chemical Sciences and Technology

Committee on

Enhancing the U.S. Chemical Economy through Investment in Fundamental Research in the Chemical Sciences

MEETING AGENDA

February 4-5, 2021

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Members of the public are welcome to attend all open sessions. Closed sessions are for committee members only.

If you would like to join an open session, please email Olivia Torbert, otorbert@nas.edu, to receive a zoom invitation.

February 4, 1:00-6:00 pm EST

CLOSED Session 1:00 - 2:30 pm EST

2:30 **Discussion with Sponsors on Statement of Task**

Click here to view sponsor biographical information.

Michelle Bushey, National Science Foundation - Division of Chemistry

Lin Hi, National Science Foundation - Division of Chemistry

Bruce Garrett, Department of Energy - Office of Science

Timothy Reinhardt, Department of Energy - Office of Fossil Energy

Mary Kirchhoff, American Chemical Society

Roger van Zee, National Institute of Standards and Technology

Carlos Gonzalez, National Institute of Standards and Technology

CLOSED Session 4:00 - 5:00 PM EST

February 5th, 1:00-5:00 pm EST

CLOSED Session 1:00 - 2:00 PM EST

2:00 **Productivity and Funding of Academic Chemistry**

Joshua L. Rosenbloom, University of Iowa

Relevant Articles:

Show me the Money: Federal R & D Support for Academic Chemistry, 1990–2009

The Effects of Research & Development Funding on Scientific Productivity: Academic Chemistry, 1990-2009

2:30 **Overview of the Chemistry Business**

Kevin Swift, American Chemistry Council

Relevant Report:

2020 Guide to the Business of Chemistry

3:00 **Safeguarding the Bioeconomy NASEM Report: Committee Presentation**

Click here to view biographical information

Dr. Thomas M. Connelly, Jr., American Chemical Society

Dr. Mary E. Maxon, Lawrence Berkeley National Laboratory

Dr. Carol Corrado, The Conference Board

Reference Materials:

Report: Safeguarding the Bioeconomy

Report Summary

4:00 **Break** **CLOSED** Session 4:00 - 5:00 PM EST

SPEAKER BIOGRAPHIES

Study Sponsors

Dr. Michelle Bushey is a Program Director in the Division of Chemistry at the National Science Foundation. The Division of Chemistry (CHE) supports innovative research in chemical sciences, integrated with education, through strategic investment in developing a globally engaged U.S. chemistry workforce reflecting the diversity of America. Dr. Bushey earned her PhD in chemistry from University of North Carolina, Chapel Hill

Dr. Lin He is the Deputy Division Director of the Division of Chemistry at the National Science Foundation. The Division of Chemistry (CHE) supports innovative research in chemical sciences, integrated with education, through strategic investment in developing a globally engaged U.S. chemistry workforce reflecting the diversity of America. Dr. He earned her PhD in chemistry from Pennsylvania State University in 2000.

Dr. Bruce Garrett is the Director of the Chemical Sciences, Geosciences, and Biosciences Division in the Office of Basic Energy Sciences (BES) at the Department of Energy. BES' portfolio includes experimental, theoretical, and computational research to provide fundamental understanding of chemical transformations and energy flow in systems relevant to DOE missions. Before joining BES he was Chief Scientist for Chemical Sciences at Pacific Northwest National Laboratory (PNNL). During his 27 years at PNNL he managed organizations ranging from small research groups to the Physical Sciences Division and served as the point of contact for the PNNL's BES Chemical Sciences, Geosciences, and Biosciences programs. Recognition of his scientific contributions includes being named Fellow of the American Physical Society, the American Association for the Advancement of Science, and the Royal Society of Chemistry. Dr. Garrett received Ph.D. in Chemistry from the University of California, Berkeley.

Tim Reinhardt is the Director of the Division of Supply and Delivery in the Office of Oil and Natural Gas within Fossil Energy at the Department of Energy (DOE). Tim previously worked within DOE in the Geothermal Technologies Office as the Program Manager for the Systems Analysis and

Low-Temperature Programs; and also served as the International lead. Mr. Reinhardt holds Master's Degrees from the University of Oklahoma and the University of Texas at Austin.

Dr. Mary Kirchhoff is the Executive Vice President of Scientific Advancement at the American Chemical Society. Dr. Kirchhoff served for nine years on the faculty at Trinity College in Washington, D.C., and three years as an American Association for the Advancement of Science (AAAS) environmental fellow and visiting scientist at the U.S. Environmental Protection Agency. She spent three years with the ACS Green Chemistry Institute before moving to the ACS Education Division, where she served as Director from 2005-2016. Dr. Kirchhoff is a Fellow of AAAS and a member of the Academy's Chemical Sciences Roundtable. Dr. Kirchhoff earned a Ph.D. in organic chemistry from the University of New Hampshire.

Dr. Roger van Zee is the Deputy Division Chief for the Chemical Sciences Division at NIST. He is also the Scientific Program Coordinator for the NIST Facility for Adsorbent Characterization and Test ("FACTLab"). Dr. Roger van Zee joined the National Institute of Standards and Technology (NIST) as a National Research Council Postdoctoral Fellow in 1992. Since then, he has held a number of research and managerial positions at NIST and at other Executive Branch Agencies including establishing the Nanoscale Process Metrology Group at NIST and served as Chair of the Strategic Planning Task Force for the US National Nanotechnology Initiative (NNI).Dr. van Zee earned a PhD in chemical physics from the University of California, Berkeley.

Dr. Carlos Gonzalez is the chief of the Chemical Sciences Division at the National Institute of Standards and Technology with the Department of Congress. Dr. Gonzalez joined NIST in 1997 as a member of the Computational Chemistry Group within the Physical and Chemical Properties Division. Dr. Gonzalez was appointed to the position of Chief, Chemical and Biochemical Reference Data Division in 2008 and began serving in his current position in 2012. Dr. Gonzalez received his Ph.D. in Chemistry from Wayne State University, Detroit, MI.

Productivity and Funding of Academic Chemistry

Dr. Joshua L. Rosenbloom is a Professor of Economics and Chair of the Department of Economics at Iowa State University. He is also a Research associate of the National Bureau of Economic Research (Cambridge, MA). He holds an A.B. degree in History from Oberlin College (1981), and a Ph.D. in Economics from Stanford University (1988). His research interests include the economic history of the United States, labor economics, the economics of science and innovation, and science policy. He is the author of one book and more than 30 peer-reviewed journal articles in Economic History, Labor Economics, and Science Policy. He began his career at the University of Kansas in 1988 and remained on the faculty there until moving to Iowa State University in 2015. During his tenure at the University of Kansas he was Director of the Center for Economic and Business Analysis in the Institute for Policy Research (2001-2006), and Associate Vice Chancellor for Research & Graduate Studies (2006-2012). He has also served as Director of the U.S. National Science Foundation's Science of Science and Innovation Policy (SciSIP) program (2012-2014).

Overview of the Chemistry Business

Dr. Thomas Kevin Swift is Chief Economist and Managing Director at the American Chemistry Council in Washington, DC, where he is responsible for economic and other analyses dealing with the economic/business environment as well as policy issues and the benefits of chemistry. The Council represents the leading companies engaged in the business of chemistry. Council members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. Dr. Swift specializes in making presentations about: leading indicators and business cycle analysis; unconventional oil and gas, energy & the economy; the manufacturing renaissance; tax reform, deregulation & the economy; and the outlook for economy and the chemical industry.

Safeguarding the Bioeconomy NASEM Report

Dr. Thomas M. Connelly, Jr. (NAE) is the Executive Director and CEO of the American Chemical Society. Dr. Connelly previously served as DuPont Company's Executive Vice President, Chief Innovation Officer, and a member of the company's Office of the Chief Executive. In that capacity, he was responsible for Science & Technology and the geographic regions outside the United States, as well as Integrated Operations which includes Operations, Sourcing & Logistics and

Engineering. At DuPont, Dr. Connelly led businesses and R&D organizations, while based in the US, Europe and Asia. Dr. Connelly graduated with highest honors from Princeton University with degrees in Chemical Engineering and Economics. As a Winston Churchill Scholar, he received his doctorate in chemical engineering from the University of Cambridge. He is a Director of Grasim Industries, an Indian listed company. He has served in advisory roles to the U.S. Government and the Republic of Singapore.

Dr. Mary E. Maxon is the Associate Laboratory Director for Biosciences at Berkeley National Laboratory. Dr. Maxon oversees Berkeley Laboratory's Biological Systems and Engineering, Environmental Genomics and Systems Biology, Molecular Biophysics and Integrated Bioimaging Divisions, and the DOE Joint Genome Institute. She earned her B.S. in biology and chemistry from the State University of New York, Albany, and her Ph.D. in molecular cell biology from The University of California, Berkeley. Dr. Maxon has worked in the private sector, both in the biotechnology and pharmaceutical industry, as well as the public sector, highlighted by her tenure as the Assistant Director for Biological Research at the White House Office of Science and Technology Policy (OSTP) in the Executive Office of the President, where she developed the National Bioeconomy Blueprint.

Dr. Carol Corrado is Distinguished Principal Research Fellow at The Conference Board and Senior Policy Scholar at the Center for Business and Public Policy, McDonough School of Business, Georgetown University. Her primary research focus is measuring intangible capital and digital innovation and analyzing their role in the macroeconomy and economic growth. A recent essay on re-imagining GDP that she co-authored won the inaugural Indigo Prize in 2017. Previous awards include the International Association of Research on Income and Wealth's 2010 Kendrick Prize, the American Statistical Association's Julius Shiskin Award for Economic Statistics in 2003 and a Special Achievement Award from the Federal Reserve Board in 1998. Corrado holds a PhD in economics from the University of Pennsylvania and a BS in management science from Carnegie-Mellon University.