**MIT Joint Program on the Science and Policy of Global Change**

# XLVI GLOBAL CHANGE FORUM

## 28–29 March, 2024
## MIT Samberg Conference Center

**50 Memorial Drive, 7th Floor, Building E52**
**The Morris and Sophie Chang Building**
**Sloan School of Management, Cambridge, MA USA**

# SAVE THE DATE:
# 27–28 MARCH, 2025

## GLOBAL CHANGE FORUM XLVII

**Location: MIT Samberg Conference Center
50 Memorial Drive, Cambridge MA**

# A word from the Director:

Hottest day on record. Hottest month on record. Extreme marine heatwaves. Record-low Antarctic sea-ice. While El Niño is a short-term factor in recent record-breaking heat, human-caused climate change is the long-term driver. As global warming edges closer to 1.5°C—the aspirational upper limit set in the Paris Agreement—ushering in more intense and frequent climate extremes much sooner than many expected, accelerated action will be needed to keep the planet from exceeding that threshold. Mobilizing that action will require efficient, effective and politically viable climate policies, coupled with persuasive communications strategies to build support for those policies among a wide range of stakeholders. This urgent need is reflected in this year's Global Change Forum theme—*The heat is on: Accelerating climate action at a time of record-breaking temperatures*.

Over the next two days, we look forward to enlightening presentations and vigorous discussions in six sessions:

• Climate Change Trends

• Physical and Health Impacts

• Economic Impacts

• Current Climate Policies

• Future Climate Policies

• Climate Communication: The Path Forward

I hope that by the end of this conference you will emerge with new, actionable insights that you can apply to help solve critical problems from the organizational to the societal level.

**–Ronald G. Prinn, MIT Joint Program Director**

# Agenda

## Thursday 28 March 2024

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|---|---|
| **8:30** | CHECK-IN AND LIGHT BREAKFAST |

**9:00 Opening Remarks**

**Prof. Ronald G. Prinn** • MIT Joint Program • *Director*

**9:15 Session 1: Climate Change Trends**

**Moderator: Anne Slinn** • MIT Joint Program • *Executive Director for Research*

**Derek Arndt** • National Centers for Environmental Information • *Director*

**Adam Schlosser** • MIT Joint Program • *Deputy Director and Senior Research Scientist*

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| **10:30** | COFFEE BREAK |

**11:00 Session 2: Physical and Health Impacts**

**Moderator: Jennifer Morris** • MIT Joint Program • *Principal Research Scientist*

**Xiang Gao** • MIT Joint Program • *Principal Research Scientist*

**Arlene Fiore** • MIT Department of Earth, Atmospheric and Planetary Sciences • *Professor*

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| **12:15** | LUNCH |

**13:15 Session 3: Economic Impacts**

**Moderator: Angelo Gurgel** • MIT Joint Program • *Research Scientist*

**Jennifer Morris** • MIT Joint Program • *Principal Research Scientist*

**James Rising** • U. of Delaware, School of Marine Science and Policy • *Assistant Professor*

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| **14:45** | COFFEE BREAK |

**15:15 Session 4: Current Climate Policies**

**Moderator: Sergey Paltsev** • MIT Joint Program • *Deputy Director; Sr. Research Scientist*

**Gilbert Metcalf** • MIT Sloan School of Management • *Visiting Professor*

**Bert Saveyn** • European Commission, Office of Chief Economist, Directorate General for Energy • *Team Leader for Energy Economics and Modeling*

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| **16:30** | RECEPTION |

## Thursday 28 March 2024

**17:00  Dinner and Keynote**

**Melissa Hoffer** • State of Massachusetts • *Climate Chief*

## Friday 29 March 2024

**8:00  CHECK-IN AND LIGHT BREAKFAST**

**8:45  Session 5: Future Climate Policies**

**Moderator: Adam Schlosser** • MIT Joint Program • *Deputy Director; Sr. Research Scientist*

**Robert Stavins** • Harvard University, John F. Kennedy School of Government • *Professor*

**Sergey Paltsev** • MIT Joint Program • *Deputy Director and Senior Research Scientist*

**10:00  COFFEE BREAK**

**10:30  Session 6: PANEL: Climate Communication: the Path Forward**

**Moderator: Henry Jacoby** • MIT Joint Program • *Professor Emeritus; Co-Director Emeritus*

**Susanne Moser** • Susanne Moser Research & Consulting • *Director; Principal Researcher*

**Noelle Selin** • MIT Department of Earth, Atmospheric and Planetary Sciences; MIT Institute for Data, Systems and Society • *Professor*

**David Reiner** • University of Cambridge, UK, Judge Business School • *Professor*

**Michelle A. Amazeen** • Boston University, Dept. of Mass Communication, Advertising and Public Relations • *Associate Professor & Director of Communication Research Center*

**12:30  Closing Remarks**

**Prof. Ronald G. Prinn** • MIT Joint Program • *Director*

**12:45  LUNCH**

# Biographies

### Prof. Ronald G. Prinn

**Director, MIT Joint Program on the Science and Policy of Global Change**

**Director, MIT Center for Global Change Science**

Prof. Prinn works with social scientists to link science, economics and policy aspects of global change. He co-led the development of the MIT Integrated Global System Modeling (IGSM) framework, which is used to estimate uncertainty in climate predictions and analyze proposed climate policies. He leads the Advanced Global Atmospheric Gases Experiment, in which the rates of change of the concentrations of the greenhouse and ozone-depleting gases have been measured continuously over the globe for more than 40 years to determine their emissions, lifetimes in the atmosphere, and radiative forcing of climate change. A past Head of the MIT EAPS Department, Prof. Prinn is a Fellow of the AGU and AAAS, a recipient of the AGU's Macelwane Medal, and past Chair of the AAAS Atmospheric and Hydrospheric Sciences. He has twice given invited testimony to Congress on climate change. He was the inaugural Chairman of the Steering Committee of the International Global Atmospheric Chemistry Project, a member of the NAS/NRC Space Science Board, and Chairman of its Committee on Earth Sciences.

## Session 1

### Ms. Anne Slinn, Moderator

**Executive Director for Research, MIT Joint Program on the Science and Policy of Global Change**

Ms. Slinn has over 30 years of experience at MIT facilitating cooperative interdisciplinary research, and multi-institutional and international collaborations that address global challenges at the nexus of the environment, energy and economics. An engineer by training and an alumna of MIT, she serves as Executive Director for Research at the MIT Center for Global Change Science and the MIT Joint Program. She manages a diverse portfolio of sponsored research supported by federal agencies, industry, foreign ministries, foundations and private donors. Her key roles involve alignment of priorities and resources, oversight of finances, administration and communication, and coordination of collaborative efforts.

# Mr. Derek Arndt



**Director, National Centers for Environmental Information (NCEI)**

Mr. Arndt has held multiple positions at NCEI, which maintains many of the world's weather, ocean and geophysical observations, records and data sets, and hosts four International Science Council World Data Centers. His previous NCEI roles include Climate Science and Services Division Chief and head of NCEI's Climate Monitoring team. He recently co-chaired the U.S. Global Change Research Program Indicators Interagency Working Group, and on the Council of the American Meteorological Society. He previously served in several capacities at the Oklahoma Climatological Survey, and is a graduate of the University of Oklahoma's School of Meteorology. His career has emphasized the importance of turning data into information relevant to decision-making. To that end, he and his team have worked diligently to cultivate new relationships and maintain long-standing relationships with a diverse set of partners, from state and Federal emergency management, departments of agriculture, state climatologists, and the community of climate services practitioners.

# Dr. C. Adam Schlosser



**Deputy Director and Senior Research Scientist, MIT Joint Program on the Science and Policy of Global Change**

Dr. Schlosser was previously an Associate Research Scientist at the NASA Goddard Space Flight Center and a research scientist at the Center for Ocean Land Atmosphere Studies. He conducted his postdoctoral work at NOAA's Geophysical Fluid Dynamics Laboratory. His primary interests are the modeling, prediction and risk assessment of natural, managed and built water-energy-land systems using the MIT IGSM framework, which includes model development of the Global Land System and Water Resource System. Dr. Schlosser has also undertaken studies of hydrology, weather and climate and their predictability and limits-to-prediction, and participated in and led international experiments aimed at assessing the performance of Earth-system model simulations and predictions. His current research activities also include: the study of extreme events and associating their potential changes and risks for natural, managed and built environments; water-resource assessments to inform mitigation and adaptation strategies; and renewable energy resource and intermittency assessments.

## Dr. Jennifer Morris, Moderator

**Principal Research Scientist, MIT Joint Program on the Science and Policy of Global Change**

Dr. Morris' research focuses primarily on risk analysis, uncertainty analysis, and decision-making under uncertainty in energy and environmental systems. This work involves quantifying key uncertainties (e.g. changes in world markets, policies, technologies, climate, etc.), and applying different methodological approaches to models in order to formally represent such uncertainties and explore how they impact near-term decisions. A key focus is evaluating risks to different investment options in energy and water and identifying those that are robust to potential risks. Dr. Morris also works on the assessment of energy technologies and energy/climate policies, and contributes to the development of the Joint Program's computable general equilibrium model, the EPPA model. She holds a PhD in Engineering Systems and an MS in Technology and Policy from MIT.

## Dr. Xiang Gao

**Principal Research Scientist, MIT Joint Program on the Science and Policy of Global Change**

Dr. Gao's research focuses on understanding the role of land in shaping weather, climate, hydrology, biogeochemistry and water resources at local to global scales using powerful methodologies such as supercomputing model simulations and satellite remote sensing. This research encompasses a wide range of topics, including the development and application of land-surface models, remote sensing of vegetation biophysical parameters, characterizing climate extremes and their responses to shifts in climate regimes, the global hydrological cycle, arctic permafrost degradation and associated biogeochemistry impacts, and risk-based water resource assessment. She has been actively involved in several national and international projects, including the NASA Earth Observing System (EOS) Moderate Resolution Imaging Spectroradiometer (MODIS), the 2nd Global Soil Wetness Project (GSWP-2), the NASA Energy and Water Cycle Study (NEWS), and Science Utilization of Soil Moisture Active Passive (SUSMAP), and serves as a member of Permafrost Carbon Network.

## Prof. Arlene Fiore

**Professor, MIT Dept. of Earth, Atmospheric, and Planetary Science**

Prof. Fiore studies the two-way interactions between air pollutants and the climate system, at scales ranging from urban to global, and from daily to decades-long. After earning an AB in environmental geoscience and PhD in Earth and planetary sciences at Harvard University, she worked as a research scientist in the NOAA Geophysical Fluid Dynamics Laboratory and on the faculty at Columbia University's Department of Earth and Environmental Sciences and Lamont-Doherty Earth Observatory. She has served on the NAS Board on Atmospheric Sciences and Climate and multiple NCAR advisory panels and committees, and has co-authored reports on air quality and climate for policymakers and government agencies. As a principal investigator and member of the NASA Health and Air Quality Applied Sciences Team, she partners with air and health management groups to address emerging needs with applications of satellite and other Earth science datasets. The American Geophysical Union has recognized her with the James R. Holton Junior Scientist Award and James B. Macelwane Medal.

## Session 3

## Dr. Angelo Gurgel, Moderator

**Research Scientist, MIT Joint Program on the Science and Policy of Global Change**

Dr. Gurgel develops economic modeling and applied research on climate policy, climate change, land-use change, bioenergy, agricultural and environmental economics. In Brazil he served as Professor at the Sao Paulo School of Economics, Fundacao Getulio Vargas (FGV), and the University of Sao Paulo. He coordinated the FGV master´s program on Agribusiness and the FGV Observatory of the Plan on Low-Carbon Emissions in Agriculture, and was a recipient of the Best Policy Analysis Paper of 2012 in *Environmental Science and Technology*. He has served as consultant or advisor in projects for institutions as the World Bank, the Climate and Land Use Alliance, the California Air Resource Board, the Research Association of the Large Scale Experiment of Biosphere-Atmosphere in the Amazon, the Brazilian Development Bank, and the National Industry Confederation of Brazil, among others. He holds a BS in Agricultural Engineering and PhD in Applied Economics from University of Viçosa – Brazil.

## Dr. Jennifer Morris - See Session 2, page 6

## Prof. James Rising

**Assistant Professor, School of Marine Science and Policy, University of Delaware**

Prof. Rising studies the economics of environmental policy, with an emphasis on risks from climate change and human-natural complex systems. His research includes work on marine fisheries, climate justice, the social cost of carbon, tipping points, climate risks for water and agriculture, and the future of coffee. Prior to joining UD, he was a researcher at the Grantham Research Institute at the London School of Economics and Political Science, and held postdoctoral positions at the Energy & Resources Group at University of California, Berkeley, and the Energy Policy Institute at the University of Chicago.

# Session 4

## Dr. Sergey Paltsev, Moderator
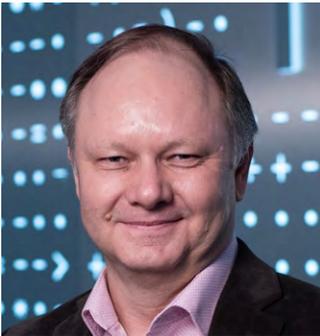
**Deputy Director and Senior Research Scientist, MIT Joint Program on the Science and Policy of Global Change**

Dr. Paltsev is the lead modeler in charge of the MIT Economic Projection and Policy Analysis (EPPA) model of the world economy. He is an author of more than 100 peer-reviewed publications in scientific journals and books in the area of energy economics, climate policy, transport, advanced energy technologies, and international trade. He was a Lead Author of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC), and a recipient of the 2012 Pyke Johnson Award (by the Transportation Research Board of the National Academies, USA, for the best paper in the area of planning and environment).

## Mr. Gilbert Metcalf

**Professor of Economics Emeritus, Tufts University**

**Visiting Professor, MIT Center for Energy and Environmental Policy and MIT Sloan School of Management**

Gilbert E. Metcalf is the John DiBiaggio Professor of Citizenship and Public Service Emeritus at Tufts University. His primary research area is applied public finance with particular interests in taxation, energy, and environmental economics. His current research focuses on policy evaluation and design in the area of energy and climate change. During 2011 and 2012, he served as the Deputy Assistant Secretary for Environment and Energy at the U.S. Department of Treasury, where he was the founding U.S. Board Member for the UN-based Green Climate Fund. He received a BA in Mathematics from Amherst College, an MS in Agricultural and Resource Economics from the University of Massachusetts Amherst, and a PhD in Economics from Harvard University.

## Dr. Bert Saveyn

**Team Leader for Energy Economics and Modeling, Office of Chief Economist, Directorate General for Energy, European Commission**

In his current position, Dr. Saveyn has been closely involved in the recent 2040 Communication, the Green Deal package, and the RePowerEU and energy crisis agenda. Previously, at the Joint Research Centre (JRC) of the European Commission, he led various projects analyzing the economic implications of climate change and energy policies.

## Keynote

## Ms. Melissa Hoffer

**Climate Chief, State of Massachusetts**

The state's first Climate Chief, Ms. Hoffer served as Acting General Counsel and Principal Deputy General Counsel of the EPA during the Biden Administration. Previously, she worked in the Massachusetts Attorney General's Office as Chief of the Environmental Protection Division, and was named Chief of AG Healey's newly formed Energy and Environment Bureau in 2015. Hoffer oversaw the work of the Bureau's attorneys on matters including prosecuting civil and criminal enforcement of environmental laws, proceedings before the DPU, energy policy, and defensive cases. She led the Office's litigation against ExxonMobil for deceiving Massachusetts investors and consumers about the risk climate change poses to Exxon's business and global financial markets, and the impacts of its fossil fuel products on climate change. Previously, Hoffer held senior roles at the Conservation Law Foundation and served as a litigator and environmental lawyer at WilmerHale. She received a JD from Northeastern University School of Law, Certificate in Environmental Management from Tufts University, MEd from the University of Massachusetts, and BA from Hampshire College.

## Session 5

**Prof. Robert Stavins**

**Professor of Energy & Economic Development, John F. Kennedy School of Government, Harvard University**

Prof. Stavins is Director, Harvard Environmental Economics Program; and Director, Harvard Project on Climate Agreements. He is a University Fellow, Resources for the Future; Research Associate, National Bureau of Economic Research; elected Fellow, Association of Environmental and Resource Economics; Member, Board of Directors, Resources for the Future; and Editor, Journal of Wine Economics. He was Chairman, Environmental Economics Advisory Board, US Environmental Protection Agency. He was a Lead Author, Second and Third Assessment Reports, Intergovernmental Panel on Climate Change; and Coordinating Lead Author, Fifth Assessment Report. His research has examined diverse areas of environmental economics and policy, and appeared in more than a hundred articles in academic journals and popular periodicals, plus a dozen books. He holds a BA in philosophy from Northwestern University, an MS in agricultural economics from Cornell, and a PhD in economics from Harvard.

## Session 6 - Panel

**Prof. Henry D. Jacoby, Moderator**

**William F. Pounds Professor of Management, Emeritus, MIT Sloan School of Management**

**Founding Co-Director, Emeritus, MIT Joint Program on the Science and Policy of Global Change**

At MIT Prof. Jacoby has served as Founding Co-Director of the Joint Program, Director of CEEPR, Associate Director of the Energy Laboratory, and Chair of the Faculty. He has also served on the U.S. National Petroleum Council, the Scientific Committee of the International Geosphere-Biosphere Program, and on several National Academy Committees (NACs). Recent NACs include one on Approaches to Updating the Social Cost of Carbon, and another to advise the U.S. Global Change Research Program. Prof. Jacoby holds a BA in Engineering from the University of Texas, Austin, a PhD in Economics from Harvard University, and a Doctorats Honoris Causa from the University of Geneva.

## Dr. Susanne Moser

**Director and Principal Researcher, Susanne Moser Research & Consulting**

**Research Scholar, School of Environmental Studies, Antioch University New England**

A geographer by training (PhD'97, Clark University), Dr. Moser works nationally and internationally as an independent scholar and consultant on adaptation to climate change, science-policy interactions, effective climate change communication, and psycho-social resilience in the face of the traumatic and transformative challenges associated with climate change. She is the Founder of the Adaptive Mind Project, a capacity building and restorative training initiative to build the psychosocial skills needed for these times. She is also the editor of two award-winning edited volumes, one on successful adaptation to climate change; the other on how to communicate climate change. She has served on scientific advisory boards for Future Earth, the International Science Council, and the US National Research Council, and has contributed to the IPCC and US national climate assessments.

## Prof. Noelle Selin

**Professor, MIT Department of Earth, Atmospheric and Planetary Sciences, MIT Institute for Data, Systems and Society**

**Director, MIT Technology and Policy Program**

Prof. Selin's research uses modeling and analysis to inform sustainability decision-making, focusing on issues involving air pollution, climate change and hazardous substances such as mercury. She received her PhD and MA (Earth and Planetary Sciences) and BA (Environmental Science and Public Policy) from Harvard University. Her work has focused on atmospheric chemistry, air pollution, as well as interactions between science and policy in international environmental negotiations. She is the recipient of a US National Science Foundation CAREER award, a Leopold Leadership fellow, Kavli fellow, a member of the Global Young Academy, an American Association for the Advancement of Science Leshner Leadership Institute Fellow, and a Hans Fischer Senior Fellow at the Technical University of Munich Institute for Advanced Study.

## Prof. David Reiner

**Professor of Technology Policy, Judge Business School, and Assistant Director, Energy Policy Research Group, University of Cambridge, UK**

Prof. Reiner is a Research Associate of both the MIT Joint Program on the Science and Policy of Global Change and Center for Energy and Environmental Policy Research. His research focuses on the political economy of net zero and the energy transition, particularly on decarbonizing hard-to-abate sectors and on greenhouse gas removal. He has led public and stakeholder surveys on energy and

climate change in over a dozen European countries as well as in China, India, Brazil, Japan, the US and Australia. He is one of two academic members of the CCUS Council, which is chaired by the UK Energy Minister, and is on the Advisory Board of the £210m UKRI Industrial Decarbonisation Challenge. His degrees include: BSc (McGill University), MA (Princeton University), PhD (MIT).

## Prof. Michelle A. Amazeen



**Associate Professor and Director of the Communication Research Center, Department of Mass Communication, Advertising and Public Relations, Boston University**

Dr. Amazeen examines mediated persuasion and misinformation, exploring the nature and persuasive effects of misinformation and efforts to correct it. She employs a variety of qualitative and quantitative methods to yield results with practical applications for journalists, educators, policymakers and consumers who strive to foster recognition of and resistance to persuasion and misinformation in media. Her work has appeared in publications such as *Communication Monographs; Digital Journalism*; *Journalism; Journalism & Mass Communication Quarterly*; *New Media & Society, and Science Communication*. She is one of 22 prominent scholars from around the globe with expertise in misinformation and its debunking who contributed to The Debunking Handbook 2020. She is currently a co-investigator on the Boston University Climate Disinformation Initiative, with a focus on climate issues in native advertising. Her related book, *Content Confusion: Navigating News Media, Native Advertising, and Policy in an Era of Disinformation* (MIT Press) is due out in 2025.

## Closing Remarks

Prof. Ronald G. Prinn - See Opening Remarks, page 4