NATIONAL ACADEMIES Sciences Engineering Medicine

NATIONAL ACADEMIES ROUNDTABLE ON ARTIFICIAL INTELLIGENCE & CLIMATE CHANGE

Bridging AI & Earth Systems Forecasting Applications

AI for Weather & Climate Forecasting Webinar Series

Artificial intelligence (AI) is rapidly advancing frontiers in weather and climate forecasting, transforming how information is modeled, interpreted, and used to inform decision-making. These advancements open new opportunities for enhancing prediction, expanding forecast usability, and enabling more targeted and equitable responses to climate risks and are built upon foundational techniques such as physics-based simulation and forecasting methods. This webinar series has highlighted technical challenges associated with AI-enhanced weather and earth systems forecasting, facilitated shared understanding about AI for model emulation, and advanced AI for Earth systems and extreme weather forecasting. This final episode will bring together end users to discuss key messages heard throughout prior webinars, focusing on whether AI models can help with issues of fairness and 'democratization' of climate and weather data and the trustworthiness of AI models.

Join the livestream at this link and submit your questions and comments using this link. Speaker materials and a recording of the webinar will be made publicly available on this page.

This is the final episode of a 4-part educational webinar series, AI for Weather & Climate Forecasting, which is a primer to an upcoming workshop on accelerating climate progress with AI (view previous episodes of the webinar series here). The workshop will explore innovative ways AI can enhance and accelerate, climate action with a focus on decision-making and adaptation measures to foster resilience to climate change impacts. Register to attend the workshop in person or virtually at this link. Both the webinar series and workshop are activities of the National Academies Roundtable on Artificial Intelligence & Climate Change. The Roundtable seeks to foster ongoing discussions, shared learning, and nimble coordination around emerging issues related to AI and climate change, including: how AI can combat climate change; the environmental impact of AI itself; and strategies for mitigating the impacts of AI energy consumption and climate effects. See the Roundtable's Statement of Task here.

THURSDAY, JANUARY 8, 2026

2:00 PM (ET)[1] **Welcome**
April Melvin, National Academies Roundtable on Artificial Intelligence & Climate Change

[1] All time in Eastern

2:05 PM **Opening Remarks & Introductions**
David Gagne, National Science Foundation – National Center for Atmospheric Research
Kaiyu Guan, University of Illinois Urbana-Champaign

2:15 PM **Discussion: Bridging AI & Earth Systems Forecasting Applications**
Moderator: Anna Harper, University of Georgia

2:50 PM **Audience Q&A**

3:00 PM **ADJOURN**

Speaker Biographies

Anna Harper, University of Georgia
Dr. Harper is an Associate Professor in Geography and Atmospheric Sciences at the University of Georgia, where she has worked since 2023. Before that, she was a senior lecturer in climate science in the Department of Mathematics at the University of Exeter in the UK, where she contributed to developments in the UK Earth System Model. Her research focuses on terrestrial carbon cycle responses to climate. Through using Earth system models and data from satellite and ground measurements, she aims to better understand how ecosystems respond to a changing environment and human management, and how these responses feed back to affect the climate.

David Gagne, National Science Foundation – National Center for Atmospheric Research
Dr. David John Gagne II is a Machine Learning Scientist II and head of the Machine Integration and Learning for Earth Systems (MILES) group at the NSF National Center for Atmospheric Research (NCAR) in Boulder, Colorado. He has led the development of machine learning systems that enhance understanding and prediction of high impact weather and critical Earth system processes. He received his Ph.D. in meteorology from the University of Oklahoma in 2016 and completed an NCAR ASP Postdoctoral Fellowship before assuming his current role. He is a NSF AI2ES AI Institute leader and a NSF LEAP Science and Technology Center member. He is a WMO Nowcasting and Mesoscale Research Working Group member, chaired the American Meteorological Society Artificial Intelligence Committee, and serves as an editor for the AI for the Earth Systems journal, and has led summer schools, short courses, and hackathons.

Kaiyu Guan, University of Illinois Urbana-Champaign
Dr. Kaiyu Guan is a Levenick Endowned Professor and the Founding Director of Agroecosystem Sustainability Center at the University of Illinois Urbana-Champaign. He studies the underlying processes of plant-water-nutrient interactions for agricultural ecosystems in a changing climate. His team has developed revolutionary sensing, modeling, and AI technologies for monitoring and assessing field-level agricultural productivity and ecosystem service at scale, with the aim of increasing societal resilience and environmental sustainability.

Webinar Planning Team Biographies

Ann Bostrom, University of Washington, National Academies AI & Climate Roundtable Chair
Ann Bostrom is the Weyerhaeuser Endowed Professor in Environmental Policy at the Evans School of Public Policy and Governance, University of Washington. Until 2007 she was Professor of Public Policy and Associate Dean for Research at the Ivan Allen College of Liberal Arts at Georgia Institute of Technology, and co-directed the Decision, Risk, and Management Science Program at the National Science Foundation (NSF) from 1999 to 2001. Bostrom studies how people understand and make decisions under uncertainty about, for example, climate change and artificial intelligence, focusing on risk perceptions, communication, and mental models. Bostrom co-directs the NSF-funded Cascadia Coastlines and Peoples Hazards Research Hub and co-leads risk communication in the NSF Artificial Intelligence (AI) Institute for Research on Trustworthy AI in Weather, Climate and Coastal Oceanography. She is a Fellow and former President of the Society for Risk Analysis, and a Fellow of the American Association for the Advancement of Science. She also serves on the Washington State Academy of Sciences Board of Directors. Bostrom received her Ph.D. in policy analysis from Carnegie Mellon University, M.B.A. from Western Washington University, and B.A. in English from the University of Washington. She co-chaired the National Academies of Sciences, Engineering, and Medicine consensus report on Integrating Social and Behavioral Sciences Within the Weather Enterprise (2017) and contributed to Communicating Science Effectively: A Research Agenda (2016).

Yury Dvorkin, Johns Hopkins University
Yury Dvorkin is an Associate Professor at the Johns Hopkins University, where he is affiliated with the Ralph O'Connor Sustainable Energy Institute and serves as the U.S. Director of the National Science Foundation (NSF) Center on Electric Power Innovation for a Carbon-free Society. Dvorkin develops modeling and algorithmic solutions to integrate clean and smart grid technologies—such as renewable generation, demand response, energy storage, and cyber infrastructure—using multidisciplinary approaches from engineering, operations research, economics, and policy analysis. This research seeks to identify, enable, or compare the most efficient, reliable, and resilient pathways to a low-carbon society and to provide actionable insights for energy and climate planning and policy choices. Dvorkin is the recipient of multiple prestigious research, leadership, and service awards, including the inaugural Scientific Achievement Award by the Clean Energy Institute (2016), NSF CAREER Award (2019), Goddard Faculty Fellow (2019), Discovery Award (2023), Institute of Electrical and Electronics Engineers (IEEE) Power & Energy Society Prize Paper Award (2023), Outstanding Editor Award at the IEEE Transactions on Energy Markets, Policy and Regulation (2024), and Johns Hopkins University Provost's Public Engagement Fellowship (2025). Dr. Dvorkin earned his Ph.D. from the University of Washington in 2016 and, as a Ph.D. intern, conducted research at Los Alamos National Laboratory.

Anna Harper, University of Georgia
Dr. Harper is an Associate Professor in Geography and Atmospheric Sciences at the University of Georgia, where she has worked since 2023. Before that, she was a senior lecturer in climate science in the Department of Mathematics at the University of Exeter in the UK, where she contributed to developments in the UK Earth System Model. Her research focuses on terrestrial carbon cycle responses to climate. Through using Earth system models and data from satellite and ground measurements, she aims to better understand how ecosystems respond to a changing environment and human management, and how these responses feed back to affect the climate.

Jonathan Overpeck, University of Michigan
Professor Jonathan Overpeck is an interdisciplinary climate scientist and the Samuel A. Graham Dean of the School for Environment and Sustainability at the University of Michigan. He has a Ph.D. and master's degree from Brown University and a bachelor's degree from Hamilton College. He has written over 230 published works that have been cited over 60,000 times, including serving as a Coordinating Lead Author for the Nobel Prize winning Intergovernmental Panel on Climate Change (IPCC) 4th Assessment (2007). Other awards include the US Dept. of Commerce Gold Medal, a Guggenheim Fellowship, the Walter Orr Roberts award of the American Meteorological Society, and the Quivira Coalition's Radical Center Award. Overpeck has led two major programs focused on regional climate adaptation and serves on the State of Michigan Governor's Council on Climate Solutions, as well as the City of Ann Arbor, Michigan's Energy Commission. He has appeared and testified before Congress multiple times, is a Fellow of the American Geophysical Union (AGU) and the American Association for the Advancement of Science and is a member of the U.S. National Academy of Sciences.

Stephan Sain, Jupiter Intelligence
Stephan (Steve) Sain is a Senior Principal Data Scientist and Senior Director at Jupiter Intelligence, where he heads the data sciences team and is responsible for operational aspects of the broader Jupiter science organization. Jupiter provides data and analytics services to better predict and manage risks from weather and sea level rise, storm intensification and changing temperatures caused by medium- to long-term climate change. Steve is an experienced data science leader and applied statistician who has long worked at the intersection of climate research, applied statistics, and machine learning, including a focus on spatial methods for large datasets, extremes, uncertainty quantification, and climate risk analytics. From 2006 to 2014, he was the head of the Geophysical Statistics Project and a scientist in the Institute for Mathematics Applied to Geosciences at the National Center for Atmospheric Research in Boulder, CO. Steve is a Fellow of the American Statistical Association (ASA). He is a past recipient of the Distinguished Achievement Award from the American Statistical Association's Section on Statistics and the Environment. Steve also serves as chair for the ASA's newly formed Caucus of Industry Representatives, is a past member of the ASA's committee on climate change policy, is an affiliate faculty in the University of Colorado's Department of Applied Mathematics and is a member of the advisory board for the Institute for Mathematical and Statistical Innovation (IMSI) at the University of Chicago.

Gavin Schmidt, National Aeronautics and Space Administration – Goddard Institute for Space Studies
Dr. Gavin Schmidt is the Director of the National Aeronautics and Space Administration Goddard Institute for Space Studies (NASA GISS) and an Adjunct Senior Researcher at the Columbia University Climate School. His research is focused on the development of large-scale climate models of the Earth System, and their application to climate change in the past, present and possible futures. As the principal investigator for the NASA GISS climate model, he is working to adapt legacy models to new computational environments and to utilize machine learning in model calibration, development and application. He has published more than 160 peer-reviewed articles and the book "Climate Change: Picturing the Science" with Joshua Wolfe in 2009. He is a fellow of the American Geophysical Union (AGU) and the American Association for the Advancement of Science (AAAS), and in 2011 was the inaugural recipient of the AGU Climate Communication Prize. He has a Ph.D. in Applied Mathematics (UCL, 1994) and a B.A. (Hons) (Oxon, 1988) in Mathematics.

Abigail Snyder, Pacific Northwest National Laboratory
Abigail Snyder is an Earth Scientist at the Joint Global Change Research Institute, Pacific Northwest National Laboratory, where she has been for the last eight years. Her research revolves around the coupled human and Earth system, and methods for uncertainty characterization within sectors of that system. She co-leads an experiment of the Global Change Intersectoral Modeling System Scientific Focus Area focused on compounding influences within this system. She has led and contributed to publications focused on the energy, water, land, economic, and climate sectors and their interactions, with a focus on methodology and development. She co-led the software development of the STITCHES emulator for earth system model outputs. She also served on the recently completed Coupled Model Intercomparison 7 (CMIP7) Strategic Ensemble Design Task Team. She holds a Ph.D. in Mathematics from the University of Pittsburgh and completed her postdoctoral research at the Joint Institute.