

Optimizing Research on Experimental Prescribed Fires to Improve Understanding of Wildland Fire and Smoke Behavior

Committee

Dar Roberts

Chair

Dar Roberts is a Distinguished Professor in the Department of Geography at UC Santa Barbara. He joined UC Santa Barbara as an Assistant Professor in 1994, served as departmental Chair from 2009 to 2014, currently serves as an Associate Dean in the Graduate Division and will begin serving as interim Chair of the Geography Department on July 1, 2025. His primary research expertise is remote sensing where he specializes in wildfire, land-use/land-cover change, urban remote sensing, trace gas mapping (primarily methane), and imaging spectroscopy. He is a Fellow of the American Geophysical Union, and Fellow of the American Association for the Advancement of Science. He earned a BA from UC Santa Barbara in Environmental Biology and Geology, a MS from Stanford University in Applied Earth Science, a PhD from the University of Washington in Geological Sciences and served as a postdoc at UW from 1991 to 1993. He chaired the National Academy of Sciences Planning Committee on “Increasing Resilience to Wildland Fire: A Century of Wildland Fire Research” from 2016 to 2017.

Ilkay Altintas

Member

Ilkay Altintas is the Chief Data Science Officer of the San Diego Supercomputer Center (SDSC) as well as a Founding Faculty Fellow of the Halicioglu Data Science Institute at the University of California San Diego. She is also the Division Director of Cyberinfrastructure and Convergence Research (CICORE). Altintas specializes in scientific workflows and systems, leading collaborative teams to deliver impactful results and sustainable solutions through making computational data science and artificial intelligence (AI) work more reusable, programmable, scalable, and reproducible. She is the Founding Director of the Societal Computing and Innovation Lab which also houses the WIFIRE Program on innovation solutions for wildland fire and all-hazards. She is the PI of the NSF National Data Platform and other diverse NSF grants to develop scalable computing, AI and data systems at the digital continuum from edge to HPC. Among the awards she has received are the 2015 Institute of Electrical and Electronic Engineers (IEEE) Technical Committee on Scalable Computing (TCSC) Award for Excellence in Scalable Computing for Early Career Researchers and the 2017 Association for Computing Machinery (ACM) Special Interest Group on High Performance Computing (SIGHPC) Emerging Woman Leader in Technical Computing Award. Altintas serves on the elected Board of Governors for the IEEE Computer Society, and was appointed to the California Wildfire Technology Research and Development Review Advisory Board. Altintas received a B.S. and M.S. in computer engineering from Middle East Technical University and a Ph.D. in computational science from the University of Amsterdam.

Tirtha Banerjee

Member

Tirtha Banerjee is currently an Associate Professor in the Department of Civil and Environmental Engineering at the University of California, Irvine, where he has been a faculty member since 2019. Prior to this, he conducted postdoctoral research at the Karlsruhe Institute of Technology in Germany and Los Alamos National Laboratory as a Chick Keller and subsequently a Director's Postdoctoral Fellow. His primary expertise lies in environmental fluid mechanics, with a focus on turbulent boundary layers, ecosystem-atmosphere interactions, wildfire behavior, and natural hazards. He has conducted extensive research on prescribed fires using modeling, and novel field experiments and leads national and international research consortia focused on prescribed and wildland fires. He is the recipient of the 2022 NSF CAREER Award for his research on canopy turbulence and wildland fire dynamics, and the 2024 American Meteorological Society Outstanding Early Career Award from the Committee on Boundary Layers and Turbulence. He serves on the Science Advisory Panel of the Fire and Forest Resilience Task Force for the State of California and is Vice-President of the ICCLAS Coupled Land-Atmosphere Systems Commission under the International Association of Hydrological Sciences (IAHS). Banerjee received a B.S. in civil engineering from Jadavpur University, India and a Ph.D. in environmental science from Duke University.

He has led a field campaign in Northern California under the iFireNet Project, an international network funded, in part, by the NSF AccelNet Program.

Kelley Barsanti

Member

Kelley Barsanti, Scientist III at the National Center for Atmospheric Research (NCAR), is an expert on emissions and chemistry of organic compounds from wildland fires, with research experience and accomplishments uniquely spanning the measurement-model interface. Prior to NCAR, she was an Associate Professor (with tenure) at the University of California, Riverside. The overarching goal of her work has been to improve predictions of smoke from fires, specifically fine particulate matter (PM_{2.5}), and the effects of smoke on air quality. She has demonstrated a commitment to facilitating greater impact of ongoing wildland fire research efforts. She led the development of NEIVA (Next-generation Emissions Inventory expansion of Akagi). NEIVA is a database that integrates historical and recent observational data and was specifically designed to overcome observed barriers encountered by different user communities. She has received an NSF CAREER award and recently completed a Fulbright Fellowship in New Zealand. Barsanti received a B.A. in environmental biology and environmental studies from the University of Colorado Boulder and an M.S. and Ph.D. in environmental science and engineering from Oregon Health and Science University.

Chad Hoffman

Member

Chad Hoffman is a Professor of Wildland Fire Science and a Co-Director of the Western Forest Fire Research Center at Colorado State University. His primary expertise lies in wildland fire behavior, fuel measurement, and forestry. His research program emphasizes improving our understanding of and ability to predict fire and fuel dynamics to inform land management and prescribed fire practices. Hoffman has led and participated in several multidisciplinary wildland fire measurement campaigns and in addition to his research program he has over 20 years of experience in wildland fire education and training. He has received awards for his dedication and contributions to wildland fire science for both his research and outreach and engagement. He has been recognized as a certified Fire Ecologist by the Association of Fire Ecology since 2011. Hoffman received a B.S. and M.S. in forestry from Northern Arizona University and a Ph.D. in natural resources from University of Idaho.

He has participated in the DOD Wildland Fire Science Initiative and has worked on the development and testing of both FIRETEC and WFDS.

Adam Kochanski

Member

Adam Kochanski is an associate professor at San José State University, where he leads the fire modeling group at the Wildfire Interdisciplinary Research Center. His research focuses on fuel moisture and fire danger assessment, fire-atmosphere interactions, satellite data assimilation, fire behavior, and smoke modeling. He is a co-developer of the coupled fire-atmosphere model WRF-SFIRE, the integrated fire and air quality system WRF-SFIRE-CHEM, and the fire forecasting system WRFx, with extensive experience in fire data assimilation, fuel moisture modeling, and executing numerical simulations of fire and smoke on high-performance computing platforms. Kochanski's research interests focus on improving our understanding of how fires interact with the atmosphere across spatial and temporal scales and how they create their own weather. The overarching goal of his work is to advance fire and smoke forecasting capabilities and implement the latest research into operational practice. His research is centered on enhancing predictive capabilities and building community resilience in the face of wildfires. He is a recipient of the Fulbright Scholarship. Kochanski received an M.Eng chemical and process engineering from the Technical University of Lodz, Poland, and an M.S. and Ph.D. in atmospheric science from the University of Nevada, Reno.

Kochanski is one of the modeling leads for the Fire and Smoke Model Evaluation Experiment (FASMEE), FireFlux II, the California Canyon Fire Experiment, and CALFIDE. In addition, he is a lead developer of WRF-SFIRE, WRF-SFIRE-CHEM, and PyFOFEM models.

Rodman R. Linn

Member

Rodman (Rod) Linn is a Laboratory Fellow and FIRE team leader in the Earth and Environmental Sciences Division at Los Alamos National Laboratory (LANL). He is also a professor in the Halicioglu Data Science Institute at the University of California, San Diego (Joint UCSD/LANL appointment) and serves as the Associate Director for Fire Science for the WIFIRE lab at UC San Diego. Linn leads LANL efforts to use next-generation process-based wildfire models for the study of fundamental wildfire behavior, evaluation of prescribed fire tactics, understanding influences of complex environmental conditions on fire behavior, and wildfire's interaction with other landscape disturbances such as insects or drought. He was the principal investigator for LANL's R&D 100 winning process-based coupled fire/atmosphere model, FIRETEC, and lead developer of the LANL's R&D 100 winning fast-running coupled fire-atmosphere model QUIC-Fire. Linn received a B.S. in mechanical engineering from New Mexico State University, an M.S. in mechanical engineering from the University of Illinois Urbana-Champaign, and a Ph.D. in mechanical engineering from New Mexico State University.

Linn was a Phase I Science Team lead for the Fire and Smoke Model Evaluation Experiment (FASMEE).

Marcela Loría-Salazar

Member

Marcela Loría-Salazar is an Assistant Professor in the School of Meteorology at the University of Oklahoma and a Fellow at the Cooperative Institute for Severe and High-Impact Weather Research and Operations (CIWRO). Her research focuses on understanding atmospheric processes affecting air composition, including emissions from urban areas, wildfires, prescribed burns, agricultural activities, and dust. She integrates aerosol and gas measurements, satellite data, weather observations, numerical models, deep learning, and big data assimilation to enhance air quality forecasting and exposure assessments. Additionally, she has extensive experience in field campaigns and instrument development. She contributes to major research efforts such as NASA's PACE Mission Early Adopter Program, NOAA's Pathfinders Initiative, CIWRO, and SPARTAN Global Network. Her work has earned her numerous accomplishments, including the NASA Earth and Space Science Fellowship and awards from the Universities of Nevada, Reno, and Oklahoma. Loría-Salazar received a B.S. in meteorology from Universidad de Costa Rica and an M.S. and Ph.D. in atmospheric sciences from the University of Nevada, Reno.

M. Talat Odman

Member

Talat Odman is a Regents' Researcher and Principal Research Engineer in the School of Civil and Environmental Engineering at the Georgia Institute of Technology. He has more than 30 years of experience in atmospheric chemistry, air pollution meteorology, and air quality modeling, with a focus since 2008 on the air quality and health impacts of wildland fire smoke. His research, supported by agencies including CDC, DoD, EPA, HEI, NASA, and the U.S. Forest Service, has led to advancements in modeling smoke plumes and understanding their transport and effects. Odman served as a contributor to the scientific assessment Wildland Fire Smoke in the United States. He is a member of the American Geophysical Union (AGU) and the American Meteorological Society (AMS), and serves on the editorial board of Atmospheric Pollution Research. Odman received a B.S. in mechanical engineering from Bogaziçi University, Turkey, an M.S. in mechanical engineering from the Florida Institute of Technology, and a Ph.D. in mechanical engineering from Carnegie Mellon University.

Amanda Rau

Member

Amanda Rau is the statewide prescribed fire coordinator for the Oregon Department of Forestry. She previously served as fire manager and burn boss for The Nature Conservancy in Oregon and Washington and as an assistant professor of practice with Oregon State University Extension's Fire Program, focusing on regional wildland fire resilience. Her expertise spans wildland fire management, fire ecology, prescribed fire planning and implementation, and pyro-silviculture. She has worked for the U.S. Forest Service and Bureau of Land Management, with field experience in fire suppression, geospatial fire behavior and effects modeling, and collaborative fire management. She is a co-founder and two-time chair of the Oregon Prescribed Fire Council, supporting policy and capacity-building efforts to expand the use of beneficial fire. She is a member of Xi Sigma Pi, the national forestry honor society, and has received recognition for her leadership in prescribed fire and community-based fire management. Rau received a B.A. in philosophy from the University of Oregon and a Master's in natural resources with a focus on fire ecology and management from the University of Idaho.

Phil Rigdon

Member

Phil Rigdon is an enrolled member of the Yakama Nation and grew up on the Yakama Reservation in Southcentral Washington State. He has been the Superintendent of Yakama Nation's Natural Resources Department since May 2005 and has worked for the Tribe since June 1989. He represents the Yakama Nation on the Intertribal Timber Council, Yakima Basin Integrated Plan Executive Committee, the Washington State's Columbia River Policy Advisory Group, Tapash Sustainable Forest Collaborative, the University of Washington Ecolab, and the Hanford Natural Resource Trustee Council. He is also on Yale School of Environment Alumni Board. Rigdon received a B.S. in forest management from the University of Washington and a Master's of forestry from Yale School of Forestry and Environmental Studies.

Albert Simeoni

Member

Albert Simeoni is a Professor of Fire Protection Engineering at Worcester Polytechnic Institute in Massachusetts. He previously held academic leadership positions in fire research at the University of Edinburgh and the University of Corsica. He has over 25 years of experience in developing experimental, analytical, and numerical techniques to better understand fire and wildfire dynamics. He has studied topics such as wildland fire spread, fire impact on people and structures, as well as the fire characteristics and smoke generation during prescribed fires. He has also spent over 10 years volunteering as a firefighter in France, including in wildland firefighting. Simeoni is the recipient of the Rasbash Medal for eminence in the field of Fire Safety Engineering, from the Institution of Fire Engineers and of the Guise Medal for eminent achievement in the advancement of the science and technology of Fire Protection Engineering from the SFPE Research Foundation. Simeoni received an undergraduate degree in physics from the University of Corsica, France, an M.Eng. in mechanical engineering and a M.Sc. in physics from the University of Aix-Marseille, France, and a Ph.D. in mechanical engineering from the University of Corsica, France.

He has led: four campaigns of large-scale static fires at Savannah River National Lab with the University of Georgia; the California Canyon Fire Experiment, with Adam Kochanski (committee member) from San Jose State University; several large-scale experimental campaigns in the New Jersey Pine Barrens with the U.S. Forest Service; two field campaigns with Tall Timbers; and finally, one campaign of a large-scale burn at Konza Prairie Biological Station with the U.S. Environmental Protection Agency.

Derek Tesser

Member

Derek Tesser is a Research Scientist at Saint Louis University's Remote Sensing Lab. He previously served as inaugural faculty at the City University of New York, where he developed environmental science curricula and led study abroad programs and field data collection efforts across diverse ecoregions. His research focuses on using satellite and unmanned aerial vehicle (UAV) imagery, including radar, lidar, and optical/IR data to study terrestrial ecosystem structure, land cover change, and ecosystem functioning for biodiversity and conservation applications.. Current projects include mapping boreal forest disturbance from logging and fire, assessing prescribed burns and ungulate grazing for grassland restoration, and global pasture mapping with the Climate TRACE coalition to support greenhouse gas emission estimates. Tesser completed research internships with NASA's Jet Propulsion Laboratory for the ECOSTRESS mission, studying plant water use in forest and agricultural systems. He has participated in multiple NASA wetland campaigns, including calibration and validation efforts in the Amazon for the upcoming NISAR mission. Previously, he was a participant in the Keck Institute for Space Studies (Caltech) program "Unlocking a New Era in Biodiversity Science: Linking Integrated Space-Based and In-Situ Observations," contributing to the Ecosystem Structure and Function working groups. Tesser received an M.S. in biology from New York University and a Ph.D. in Earth and environmental sciences from the City University of New York.

J. Morgan Varner, III

Member

J. Morgan Varner, III is the Director of Research and a Senior Scientist at Tall Timbers Research Station in Tallahassee, Florida, where he has been since 2019. Prior to Tall Timbers, he was Team Leader and Biological Scientist at the U.S. Department of Agriculture Forest Service Pacific Wildland Fire Science Laboratory in Seattle. For the previous 12 years, he was a professor of fire ecology at Virginia Tech, Mississippi State University, and Humboldt State University. Morgan serves on the editorial boards of Fire Ecology and the International Journal of Wildland Fire. His expertise is in fire ecology, fire behavior, and the science and management of wildland fires. He received a B.S. in forest resources-ecosystem management from the University of Idaho, an M.S. in forestry from Auburn University, and a Ph.D. in interdisciplinary ecology from the University of Florida.

He has led multiple fire research field campaigns in the United States, including the Fire Effects discipline of the Fire and Smoke Model Evaluation Experiment. He has provided US Senate testimony on wildland fire and was a Science Team Lead on Phase II on the Fire and Smoke Model Evaluation Experiment (FASMEE). He also served as scientific support for the Fuel Moisture Content Data from the 2024 Department of Defense Wildland Fire Science Initiative Fort Stewart Campaign, with Chad Hoffman (committee member) as the PI.

Constance Karras

Staff Officer