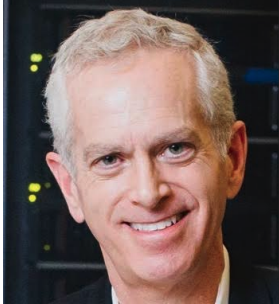


# APS/Optica report on Methane Emissions from Oil and Gas Operations

## Committee members



**Williams Collins, Ph.D.**  
**(co-chair)**

Lawrence Berkeley  
National Laboratory,  
University of California  
Berkeley

William Collins is an internationally recognized expert in climate modeling and climate change science. His personal research concerns the interactions among greenhouse gases and aerosols, the coupled climate system, and global environmental change.

Dr. Collins is a Fellow of the American Association for the Advancement of Science, the American Physical Society, and the American Geophysical Union. He was awarded the AGU's Tyndall History of Global Environmental Change Lectureship in 2019. He was a Lead Author on the Fourth, Fifth and Sixth Assessments of the Intergovernmental Panel on Climate Change.

Before joining Berkeley and Berkeley Lab, Dr. Collins was a senior scientist at the National Center for Atmospheric Research and served as Chair of the Scientific Steering Committee for the DOE/NSF Community Climate System Model project



**Raymond Orbach, Ph.D.**  
**(co-chair)**

University of Texas at  
Austin

Raymond Lee Orbach is currently a professor of the department of Mechanical Engineering at the University of Texas Austin. Prior to joining UT Austin, he served as the first Under Secretary for Science at the U.S. Department of Energy (DOE) from 2006 to 2009 and as Director of the DOE Office of Science from 2002 to 2006 and as Chancellor of the University of California (UC) from 1992 to 2002.

Dr. Orbach began his academic career as a postdoctoral fellow at Oxford University in 1960 and became an assistant professor of applied physics at Harvard University in 1961. He later joined

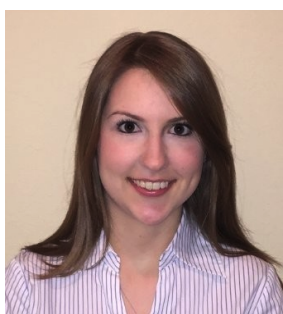
the faculty of the University of California, Los Angeles (UCLA) in 1963, and served as the Provost of the College of Letters and Science at UCLA from 1982 to 1992.

Dr. Orbach's research in theoretical and experimental physics has resulted in the publication of more than 240 scientific articles and being awarded numerous honors. He is a fellow of the American Physical Society and the American Association for the Advancement of Science, and has held numerous visiting professorships at universities around the world.



**Jeff Peischl, Ph.D.**  
CIRES and  
NOAA Chemical Sciences  
Laboratory

Jeff Peischl is an atmospheric scientist with the Cooperative Institute for Research in Environmental Sciences at the University of Colorado Boulder and an affiliate with the NOAA Chemical Sciences Laboratory in Boulder, Colorado. He has measured methane, ethane, carbon dioxide, and other greenhouse gases from various platforms, including aircraft, mobile laboratories, and ground sites. He is an author or coauthor on over 100 peer-reviewed papers, including several which quantify methane and other emissions from oil and natural gas producing regions of the United States.



**Michelle Bailey, Ph.D.**  
National Institute of  
Standards and Technology

Michelle Bailey is a Research Chemist at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland. Her research focuses on the development and implementation of optical diagnostic techniques for atmospheric trace gas analysis. Dr. Bailey's current work explores the use of mid-infrared quantum cascade lasers and optical frequency combs for precision spectroscopy in static and dynamic chemical environments. Prior to joining NIST, Dr. Bailey championed three field campaigns in Fairbanks, Alaska to investigate carbon feedbacks above thawing permafrost using open-path spectroscopy.



**Ian Coddington, Ph.D.**  
National Institute of  
Standards and Technology

Ian Coddington is currently a project leader in the Communications Technology Laboratory at the National Institute of Standards and Technology (NIST). His work has focused on the development of applications for novel frequency comb lasers and he has pioneered dual-comb techniques for greenhouse gas spectroscopy focusing heavily on methane. In his time at NIST Dr. Coddington has received a 2011 Silver medal from the Department of Commerce, a 2012 Presidential Early Career Award for Scientists and Engineers (PECASE) and the Arthur S. Flemming Award. He was most recently awarded the 2019 Colorado Governor's Award and the 2020 Department of Commerce Gold Medal for his work with the University of Colorado on low-cost detection and quantification of fugitive emissions from oil and gas infrastructure.



**Anuradha  
Radhakrishnan**  
The University of Texas at  
Austin

Anuradha Radhakrishnan is a PhD candidate in the Hildebrand department of petroleum and geosystems engineering at the University of Texas at Austin. She obtained her Bachelors' degree in Chemical Engineering from Birla Institute of Technology and Science in India. Her research interests are in the areas of natural gas flaring and foam flow in porous media. Prior to graduate school, she was a process engineer at Sulzer Chemtech.



**Sébastien Biraud, Ph.D.**  
Lawrence Berkeley  
National Laboratory

Sébastien Biraud is a biogeochemist leading the Climate Sciences Department in the Climate and Ecosystem Sciences Division at the Lawrence Berkeley National Laboratory. Sébastien is an internationally recognized expert in the field of atmospheric greenhouse gases (GHG) observations to support research on carbon cycle, satellite validation, and source attribution. His work relies heavily on the development of measurement capabilities to measure carbon exchange between the land and the atmosphere, and monitor methane fugitive emissions. These measurements and analysis activities include: (1) developing eddy covariance based systems; (2) building and testing continuous high-accuracy and high precision GHG observations system; (3) integration of GHG observation systems on manned aircraft, unmanned aerial systems, and tall towers.



**David DiCarlo, Ph.D.**  
The University of Texas at  
Austin

David DiCarlo's research is focused on applying advanced experimental techniques to understanding fluid flow in hydrocarbon reservoirs. In particular, judicious use of CT scanning provides in-situ phase saturations which can then be converted into permeabilities and relative permeabilities. These can be obtained on a much shorter time scale and over a wider range of saturations than traditional steady-state methods. Topics relevant to enhanced oil recovery such as three-phase flow (water, oil, and gas), surfactant imbibition, compositional displacements, flow stability, and the effect of nanoparticles in porous media are studied using these methods.



**David Schimel, Ph.D.**  
Jet Propulsion Laboratory

David Schimel is a Senior Research Scientist and Technical Group Supervisor for Carbon and Ecosystems at the Jet Propulsion Lab, California Institute of Technology, in Pasadena California. Prior to that he served as founding Principal Investigator and Chief Scientist for the National Ecological Observatory, Senior Scientist at the National Center for Atmospheric Research and Founding Director of the Max-Planck-Institute for Biogeochemistry in Jena, Germany. Schimel is the author of several books and over 200 research papers in ecosystem and climate science, with a focus on the global carbon cycle.

He is a fellow of the American Geophysical Union and the Ecological Society of America and remains a member of the Max-Planck Society.