

The 9th Annual Ecological Sciences and Engineering Symposium



Inequality in Complex Systems: Characterizing Global Disparities



September 21, 2015
Purdue University
West Lafayette, IN

Inequality: An Introduction

Inequality exists in many different forms and systems, including access to resources, social equity, and even ecology. The inequality gap in many of these systems has appeared to widen in recent years, such as in the distribution of wealth. Why does inequality exist, and how should we even define these disparities across different areas of study? Is such inequality inherent in these systems? Will these systems run properly without some level of inequality, and what level do societies deem acceptable? These are just some of the questions we will attempt to answer at the 2015 Ecological Sciences and Engineering Symposium, "Inequality in Complex Systems: Characterizing Global Disparities".

~~~

The symposium will bring together respected scientists, professionals, and leaders to discuss inequality from a complex systems approach. Such an approach analyzes the many components of a system and how they interact and give rise to the collective behaviors and properties of the system, as well as how the system itself interacts and forms relationships with the environment and other systems. Complex systems are inherently interdisciplinary, bringing together many fields of study to understand and research the diverse components of these systems.

~~~

By the end of the symposium, participants will have an expanded understanding of defining inequality, how it exists in both human and natural systems, and how to use this knowledge to look for solutions in the future. The discussions aim to inspire participants to use a complex systems approach in their own research and to better understand the world around them.

Symposium Organizers

Symposium Co-Chairs

Charlotte Lee
Zach Reaver

Fundraising Chairs

Ben Gottesman
Taïsha Venort

Speaker Chair

Sai Prasanth
Marcia Croft

Marketing Chairs

Holly Hauenstein
Rachel Sparks

Posters Chairs

Ehsan Vahidi
Chris Wilbanks

3MT Chairs

Colleen Moloney
Meghan Moser

Logistics Chair

Jake Widner

Catering Chair

Maria Uribe

Symposium Advisor

Christal Musser

Thank you to the following sponsors

Brian Lamb School of Communication
Burton D. Morgan Center for Entrepreneurship
Center for the Environment
Computer Information Technology
Department of Agricultural & Biological Engineering
Department of Agricultural Economics
Department of Agronomy
Department of Anthropology
Department of Botany and Plant Pathology
Department of Chemistry
Department of Curriculum and Instruction
Department of Forestry and Natural Resources
Department of Mathematics
Department of Philosophy
Department of Physics and Astronomy
Department of Political Science
Discovery Learning Research Center
Discovery Park
Earth, Atmospheric and Planetary Sciences
Energy and Construction
Environmental and Ecological Engineering
Executive Vice President for Research
Nutrition Science
Office of Interdisciplinary Graduate Programs
Office of University Sustainability
Purdue University Libraries
School of Aeronautics and Astronautics
School of Health Sciences
Technology Leadership and Innovation

Symposium Information



*All events will be held in the Purdue Memorial Union (PMU)

*Event parking is available at the Grant Street Parking Garage (PGG), directly across the street from the Purdue Memorial Union

Garage Rates:

0 – 30 minutes	\$1.00
30 – 60 minutes	\$3.00
Each Additional Hour	\$1.00
Maximum per Day	\$10.00

Schedule of Events

Time	Event	Location (PMU)
9:30 am – 10:00 am	Registration and Poster Setup	South Ballroom
10:00 am – 11:20 am	Panel 1 <i>“Defining Inequality and its Role in Complex Systems”</i>	North Ballroom
10:00 am – 12:20 pm	Poster Session (Judging: 11:30 am – 12:20 pm)	South Ballroom
12:30 pm – 2:00 pm	Panel 2 & Luncheon <i>“Practical Strategies to Address Inequality in a Changing World”</i>	North Ballroom
2:15 pm – 3:30 pm	Case Study Workshop <i>“Creating Holistic Solutions to Wicked Problems”</i>	West Faculty Lounge
3:45 pm – 5:00 pm	3MT Competition	North Ballroom
5:00 pm – 6:00 pm	Networking and Awards Reception	South Ballroom
6:15 pm – 7:30 pm	<u>Keynote Address</u> Ms. Mia Henry Executive Director for the ARCUS Center for Social Justice Leadership <i>“Love with Power: Simple Transformative Practices for Social Justice Leadership”</i>	North Ballroom

Featured Speakers



Keynote Speaker: Ms. Mia Henry

Kalamazoo College

Executive Director of the ARCUS Center for Social Justice Leadership

Ms. Mia Henry is the Executive Director and the newest staff member of the Arcus Center for Social Justice Leadership. Mia joined the team with over 15 years of experience in nonprofit management, training facilitation, intergenerational community organizing, and civic and history education. Mia was the founding director of the Chicago Freedom School (CFS), a nonprofit organization that supports youth-led social change and youth-adult partnerships in community organizing. Since her work with CFS, Mia has been a consultant nationally with Safe Places for the Advancement of Community and Equity (SPACES), and in Chicago with the Chicago History Museum, Chicago Public Schools, the University of Chicago Hospital, and the University of Chicago Oriental Institute. Mia is the owner and operator of *Freedom Lifted*, a small business dedicated to providing civil rights tours. She is also the founder of *Reclaiming South Shore for All*, a diverse, grassroots group of residents committed to mobilizing the South Shore (Chicago) community and institutionalizing systems that promote peace, youth leadership, and political accountability. She has been a visiting lecturer at the University of Illinois at Chicago and Harold Washington College, as well as a high school history teacher and International Baccalaureate (IB) program coordinator for Chicago Public Schools. Mia is deeply passionate about social movement history, positive youth development, and civic engagement through an anti-oppression lens. She serves on the Boards of Directors for the Community Justice for Youth Institute and the Worker's Center for Racial Justice. Mia earned her B.S. from Rutgers University and her M.S.Ed. from the University of Pennsylvania.



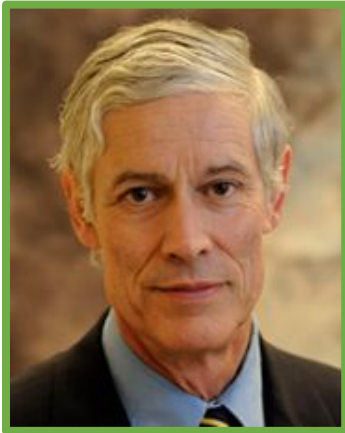
Panelist: Dr. Marlo David

Purdue University

Assistant Professor of English, Women's Gender, and Sexuality Studies

Marlo D. David received her PhD in English from the University of Florida in 2009. Her research has focused on contemporary African-American cultural studies as well as feminist gender and sexuality studies. Marlo's interdisciplinary research traces the ways black writers, artists, and performers respond to inter- and intra-racial representations of blackness and contemporary American politics in the post-Civil Rights era. Her work offers ways of interpreting African-American literature, performance, and popular culture that emphasize the multiplicities of black identities and challenge stereotypes that stigmatize black people, particularly black women and girls.

Featured Speakers



Panelist: Dr. Otto C. Doering III

Purdue University
Professor of Agricultural Economics

Professor Doering has teaching, research and outreach extension responsibilities in the Department of Agricultural Economics. He is a public policy specialist on economic issues affecting agriculture, natural resources, the environment, and energy. He has served the U.S. Department of Agriculture (USDA) working on the 1977 and 1990 Farm Bills. In 1997 he was the Principal Advisor to USDA's Natural Resources Conservation Service (NRCS) for implementing the 1996 Farm Bill and served NRCS again in 2005. From 1985 to 1990 he was director of Indiana's State Utility Forecasting Group. In 1999 he was the economic assessment team leader for the White House National Hypoxia Assessment of the dead zone in the Gulf of Mexico. Doering has served on five National Research Council Committees working on Mississippi River water quality as well as on other water and regulatory issues. He has been a member of the National Academies' Water Science and Technology Board, also served on the U.S Environmental Protection Agency's Science Advisory Board, and chaired the Science Advisory Board's Integrated Nitrogen Committee. He is a member of the Department of Interior's Invasive Species Advisory Committee. From 2009 to 2014 he directed Purdue's Climate Change Research Center.

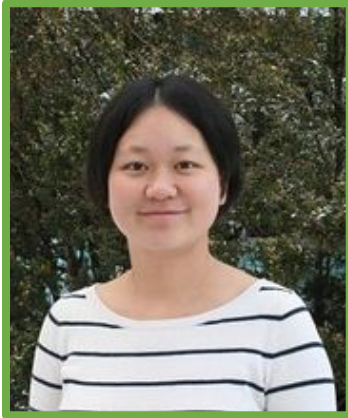


Panelist: Dr. Jeffrey Dukes

Purdue University
Professor of Forestry and Natural Resources and Biological Sciences

Jeff Dukes and his research group seek to address environmental challenges through ecological research and outreach. Their research currently focuses on three themes: understanding how ecosystems respond to climate and atmospheric change, understanding and minimizing the impacts of invasive species on ecosystems, and exploring the ecological consequences of switching our energy supply from fossil fuels to biofuels. Dukes has a particular interest in understanding how changes in climate and the atmosphere will affect the success and impact of invasive species.

Featured Speakers



Panelist: Dr. Zhao Ma

Purdue University

Assistant Professor of Sustainable Natural Resources Social Sciences

Dr. Ma is an Assistant Professor of Sustainable Natural Resource Social Science in the Department of Forestry and Natural Resources at Purdue University. She holds a Ph.D. in Natural Resources Science and Management from the University of Minnesota, and a M.A. in Sustainable International Development from Brandeis University. Her research program examines how individuals and organizations make environmental and natural resource decisions within the context of social-ecological change. Her previous and ongoing research projects

have focused on issues related to forest management, sustainable farming, climate change perception and adaptation, soil and water conservation, and wildlife-human interactions. She works both in the U.S. and internationally. Dr. Ma is part of Purdue's Building Sustainable Communities initiative. She is also an elected council member for the International Association for Society and Natural Resources (IASNR).



Panelist: Dr. Kimberly Marion-Suiseeya

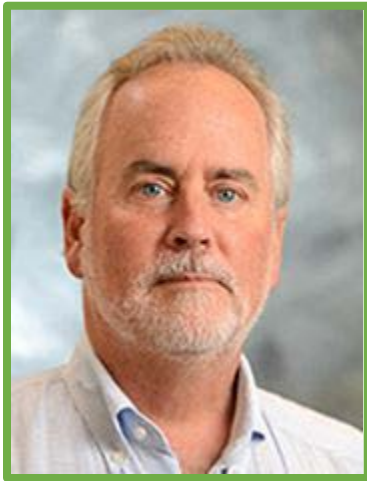
Purdue University

Assistant Professor of Environmental Justice and Community Resilience

Dr. Kimberly R. Marion Suiseeya joins Purdue as an Assistant Professor of Political Science and is part of Purdue's Building Sustainable Communities initiative. Dr. Marion Suiseeya received her PhD in Environment in 2014 from Duke University. Prior to her doctoral studies, Dr. Marion Suiseeya was a conservation and development practitioner for nearly a decade with stints in the US, Guyana, Thailand, and Laos. She also holds a B.A. in International

Relations and German Studies from Scripps College and a M.A. in International Environmental Policy from the Monterey Institute of International Studies. Dr. Marion Suiseeya's two main areas of research are Global Environmental Politics and Political Ecology. Her current project focuses on the institutional dynamics, cross scale linkages, and justice implications of global forest governance and its subsequent impacts on forest-dependent communities primarily in developing countries. More generally, her research interests include global environmental justice, rights and equity in conservation, environment and development in Southeast Asia, and institutions for global environmental governance. She is especially interested in exploring multidisciplinary and collaborative research approaches to address today's complex environmental challenges.

Featured Speakers



Panelist: Dr. Dominique Y van der Mensbrugge

Purdue University

Research Professor of Agricultural Economics, Director of GTAP

Dominique Y van der Mensbrugge is Research Professor and Director of the Center for Global Trade Analysis (GTAP) at Purdue University. Prior to joining Purdue, he worked at a trio of international agencies—Senior Economist and Team Leader of the Global Perspectives Studies Team at the Food and Agriculture Organization of the United Nations (FAO), Lead Economist in the Development Prospects Group at the World Bank and Senior Economist at the Organization for Economic Co-operation and Development (OECD). The focus of his work during his career has been on long-term structural change of the global economy and the analysis of global economic policy issues—including agricultural policies, regional and multilateral trade agreements, demographics and international migration, the Millennium Development Goals, and climate change. His work has appeared frequently in various economic journals and the agencies' flagship reports and he is one of the world's experts on global computable general equilibrium modeling. He holds both Belgian and U.S. citizenship, received his undergraduate degree in mathematics at the Université Catholique de Louvain in Belgium and a PhD in economics from the University of California, Berkeley.



Panelist: Dr. Kihong Park

Purdue University

Associate Professor of Computer Sciences

Professor Park's research centers on design and control of high-speed multimedia networks including deployable IP QoS, scalable network security, and robust distributed systems. He has published in major networking venues including ACM SIGCOMM, ACM SIGMETRICS, IEEE ICNP, and IEEE INFOCOM, and has edited two books "Self-Similar Network Traffic and Performance Evaluation" (Wiley-Interscience 2000) and "The Internet as a Large-Scale Complex System" (Oxford University Press 2005) with Walter Willinger at AT&T Research. His doctoral thesis, "Ergodicity and mixing rate of one-dimensional cellular automata" (advisor: Peter Gacs), concerned a problem in probability theory going back to John von Neumann, with applications to fault-tolerance in large-scale distributed systems. Professor Park was a recipient of the NSF CAREER Award, a Fellow-at-Large of the Santa Fe Institute, a Presidential University Fellow at Boston University, and served on several international program committees and government panels. He was chair of the NSF/SFI Workshop "The Internet as a Large-Scale Complex System," held at the Santa Fe Institute in March 2001. He served on the editorial boards of Computer Networks and IEEE Communications Letters. His research has been supported by grants from government and industry including ARO, DARPA, ETRI, Intel, NSF, NSRI, SFI, Sprint, and Xerox.

Featured Speakers



Panelist: Dr. Suresh Rao

Purdue University

Distinguished Professor of Civil Engineering and Agronomy

Dr. Rao's inter-disciplinary research and graduate education programs in environmental/ecological sciences and engineering have covered diverse research interests that have spanned from lab-scale, process-level studies.

Current research and educational interests are focused on: (1) multi-scale modeling and analysis of landscape hydrologic and biogeochemical process linkages across human-impact gradients, including intensively managed croplands, urban catchments, and wetlandscapes, with pristine catchments serving as the reference; (2) resilience-based analysis of coupled natural and engineered complex systems, including food-bioenergy-water sustainability issues. Past projects have involved development and use of models for research purposes and for decision making, with applications in catchment-scale water-quality analyses, and aquifer-scale studies on industrial land uses. Assessments, groundwater vulnerability, contaminated site remediation, and watershed management.



Panelist: Dr. Satish Ukkusuri

Purdue University

Professor of Civil Engineering

Dr. Ukkusuri is recognized nationally and internationally in the area of transportation network modeling and disaster management. He leads the Interdisciplinary Transportation Modeling and Analytics Lab at Purdue. His current areas of interest include: complex network modeling, coupled systems modeling, network resilience, big data analytics for transportation systems, dynamic traffic modeling, innovative signal control algorithms, connected vehicle environment, behavioral issues in natural hazards such as hurricanes, evacuation modeling, modeling transportation sustainability policies such as cap and trade, emissions pricing etc, sustainable freight logistics and safety modeling. His research emphasizes the importance of interdisciplinary notions that exist in multiple disciplines to produce solutions to the complex and multifaceted problems in infrastructure networks. His research derives knowledge from social sciences and computational sciences to create meaningful solutions for problems in transportation modeling, disaster management and freight logistics. He blends the development of new science based approaches with practical applications and implementation. He has published more than 180 peer reviewed journal and conference papers in the above topics. Dr. Ukkusuri's work has been funded by various grants from the National Science Foundation, the U.S. Department of Transportation, New York Metropolitan Transportation Council (NYMTC), State Departments of Transportation including INDOT, NYSDOT, NJDOT and NYCDOT, Global Policy Research Institute and Purdue Research Foundation.

