



**HAROLD AND INGE MARCUS  
DEPARTMENT OF INDUSTRIAL AND  
MANUFACTURING ENGINEERING**

# Operations Research Colloquium



## **Klaus Keller**

Professor, Geosciences  
Center for Climate Risk  
Management  
Penn State

**Tuesday  
February 5, 2018**

**4:50-5:50 p.m.  
102 Leonhard Building**

**Refreshments  
4:35 p.m.**

### **Identifying Robust Strategies to Manage Deeply Uncertain Climate Risks**

Climate change drives considerable risks. Designing strategies to manage these risks poses nontrivial challenges. For one, the hazard projections are deeply uncertain. Furthermore, we may lack actionable early warning signs to inform adaptive decision-making. In addition, stakeholders and decision-makers have diverse and often conflicting objectives. Last, but not least, the dynamics of the coupled natural human systems are highly complex and nonlinear. Using the example of coastal flood risk management, this presentation reviews approaches to (i) pinpoint the sources of decision-relevant uncertainties, (ii) refine the characterization of these uncertainties, and (iii) identify robust adaptive strategies.

### **About the Speaker**

Klaus Keller is a professor of geosciences at Penn State where he also directs the Center for Climate Risk Management. Before joining Penn State, he worked as a research scientist and lecturer at Princeton University and as an engineer in Germany. Professor Keller graduated from Princeton with a Ph.D. in civil and environmental engineering. He received master's degrees from M.I.T. and Princeton as well as an engineer's degree from the Technische Universität Berlin. His research addresses two interrelated questions. First, how can we mechanistically understand past and potentially predict future changes in the Earth system? Second, how can we use this information to design sustainable, scientifically sound, technologically feasible, economically efficient, and ethically defensible risk management strategies? He analyzes these questions by mission-oriented basic research covering a wide range of disciplines such as Earth system science, economics, engineering, philosophy, decision science, and statistics. He contributed to reports from the Intergovernmental Panel on Climate Change, co-edited an open source textbook, and published more than 100 peer-reviewed studies.

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