VANDERBILT
School *of* Engineering

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

Special Seminar

Friday,

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12:30 pm

FGH 298

"ADAPTING COMMUNITIES & THE PLANET TO GLOBAL CHANGE WITH NOVEL PHYSICS-AI-HUMAN SYSTEMS"

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ABSTRACT

The presentation will start with an overview of the convergence of complexities in natural, human-engineered, and social systems that must be understood, and harnessed where possible, to augment our ability to adapt to global change at scales ranging from communities and cities to nations and our shared planet. The challenges and opportunities of innovative principles, novel technologies, and new data-driven sciences, such as urban bonds, safe-to-fail design, nature-based green infrastructure, generative machine learning, and physics-data-human integrated systems, will be briefly discussed. The presentation will then focus on a couple of case studies, one focused on explainable and physics-guided machine learning in water, weather and climate, and the other on data-driven sciences and network-based recovery in lifeline and ecological networks. The conclusion will present a set of slides recently presented to the Governor of Massachusetts and the Mayor of Boston on Artificial Intelligence and climate resilience, and end with a brief description of a personal journey of 26 years spanning the private industry including startups, government research in national labs and with federal agencies, and in academia, often in collaboration with startups, nonprofits, and community leaders across the globe.

BIOGRAPHY

Auroop Ratan Ganguly is a distinguished professor of Civil and Environmental Engineering at Northeastern University (NU) in Boston, MA, and a joint chief scientist at the US DOE's Pacific Northwest National Laboratory in Richland, WA, where his interdisciplinary research areas includes resilience to compound extremes and adaptation to global change. He is the PI of the Sustainability and Data Sciences Laboratory (SDS Lab), the lead for the Dialogue of Civilizations study-abroad program of Climate Change and Emerging Economies, and the Director of AI for Climate and Sustainability (AI4CaS) at NU, where he has been for the last twelve years. His research has been published in journals such as Nature and PNAS, won awards at ACM KDD and SIAM, been funded by NSF, NASA, DOE, DHS, DOD, and other organizations, and he or his work have been quoted in the mainstream media such as Newsweek, the New York Times, and the Wall Street Journal. Ganguly is a Fellow of the American Society of Civil Engineers, a Distinguished Member of the Association for Computing Machinery, and has a PhD from the Massachusetts Institute of Technology in Cambridge, MA.