Critical Challenges and Funding Opportunities in Infrastructure Systems, Smart Communities, and Disasters for Climate Change Adaption

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Abstract: Driven by a changing climate, the frequency and force of extreme events such as storms, wildfires, floods, droughts, and heat waves have been increasing and new diseases are emerging. At the same time, many of nation's critical infrastructures are well beyond their service life while more people choose to live in places susceptible to natural hazards. This complex and compounding interaction of engineering, social, environmental, and climatic processes plays out over large spatial and temporal scales but remains poorly understood.

In this talk, Dr. Daan Liang begins with an overview of fundamental research supported by his core Humans, Disaster, and Built Environment (HDBE) program. Program portfolio, funding mechanisms, and past awards are presented. He then outlines several cross-cutting opportunities he has been actively engaged with, such as Smart and Connected Communities (S&CC), and Civic Innovation Challenge (CIVIC). Original and innovative ideas, whether advancing intellectual frontiers or effecting positive changes in communities, are all encouraged.

Bio: Dr. Daan Liang is the Program Director for the Humans, Disasters, and Built Environment program at the National Science Foundation. The program supports fundamental, multidisciplinary research on the interactions between humans and the built environment within and among communities exposed to natural, technological, and other types of hazards and disasters. His portfolio also includes cross-cutting disaster-related solicitations and DCLs such as Smart and Connected Communities, the CIVIC Innovation Challenge, and Innovative and Inclusive Wildland Fire Science. In addition, Dr. Liang represents the NSF on interagency working groups for the National Windstorm Impact Reduction Program, Subcommittee on Resilience Science and Technology, and Science for Disaster Reduction. Dr. Liang serves on the National Academies' Roundtable on Risk and Resilience of Extreme Events (also known as the 'Resilient America Roundtable') as an ex officio member. In 2023, he assisted US Embassy Singapore on disaster resilience and Critical and Emerging Technology issues as an Embassy Science Fellow.

Previously, Dr. Liang was a Professor in the Department of Civil, Construction, and Environmental Engineering and the Director of Center for Sustainable Infrastructure (CSI) at the University of Alabama. Dr. Liang received his bachelor's degree in engineering management from Tianjin University, China in 1997 and both his MS (1999) and PhD (2001) in civil engineering from University of Buffalo, New York. He is a licensed Professional Engineer in Texas.