

# iFAST: The International Forum on Advanced Environmental Sciences and Technology

*A series of distinguished seminars by eminent scientists*

**8 a.m. CDT, 9 a.m. EDT, 1 p.m. GMT, 9 p.m. China**  
**Wednesday, April 17, 2024**



**JIANGUO (JACK) LIU**  
MICHIGAN STATE  
UNIVERSITY

[https://www.canr.msu.edu/people/jianguo\\_jack\\_liu](https://www.canr.msu.edu/people/jianguo_jack_liu)

Jianguo “Jack” Liu is the Rachel Carson Chair in Sustainability, University Distinguished Professor, and founding director of the Center for Systems Integration and Sustainability at Michigan State University. He has been with MSU since 1995, when he completed his postdoctoral study at Harvard University. He was also a visiting scholar at Harvard, Princeton and Stanford. Liu is particularly keen to connect seemingly unconnected issues and takes a holistic approach to addressing complex human-environmental challenges through systems integration, which means he integrates multiple disciplines such as ecology, social sciences and advanced technology. His research has been published in such journals as *Nature* and *Science* and has been widely covered by the international news media. Liu is a global Highly Cited Researcher (according to Clarivate Analytics) and former president of the North American Regional Association, International Association for Landscape Ecology. He has served on various international and national committees, panels and editorial boards of international such journals as *Science*. His work has been recognized by many prestigious awards, such as the Eminent Ecologist Award of the Ecological Society of America and the Gunnerus Award in Sustainability Science from the Royal Norwegian Society of Sciences and Letters and the Norwegian University of Science and Technology. He is an elected member of the American Philosophical Society, the American Academy of Arts and Sciences and the Royal Norwegian Society of Sciences and Letters.

## **Metacoupling: A New Interdisciplinary Frontier for Global Sustainability**

**Abstract:** The world is facing numerous environmental and socioeconomic problems. They include biodiversity loss, climate change, deterioration of ecosystem services, disasters, food insecurity, land degradation, pollution, and water shortages. To solve these and other problems, the United Nations aims to achieve 17 Sustainable Development Goals by 2030 everywhere around the world. A key question is how to achieve these Sustainable Development Goals everywhere. Sustainability science, an interdisciplinary science that seeks to understand human-nature interactions behind the problems, is supposed to provide guidance for sustainable development. Sustainability science is traditionally place-based, with a focus largely on specific places separately. However, the world has been increasingly interconnected among different places due to trade, disease spread, migration, species invasion, tourism, energy flows, information flows, flows of ecosystem services and other processes. To address such socioeconomic and environmental interactions and their impacts across space, it is essential to expand the place-based sustainability science through the integrated framework of metacoupling -- human-nature interactions within a system and across adjacent and distant systems. A system refers to a coupled human and natural system, which can be a place such as a country, city, or watershed, where human and natural components interact. Although the metacoupling framework is relatively new, it has been successfully applied worldwide. This seminar will introduce the framework, provide examples of applying the framework, and highlight challenges and opportunities for applying the framework to achieve sustainability everywhere and solve various problems across local to global levels.



DODGE FAMILY COLLEGE OF ARTS AND SCIENCES  
**INSTITUTE FOR ENVIRONMENTAL GENOMICS**  
The UNIVERSITY of OKLAHOMA



**中南大學**  
CENTRAL SOUTH UNIVERSITY

**Zoom webinar ID: 934 8142 2012 ([zoom.us/j/93481422012](https://zoom.us/j/93481422012))**

**More details and previous iFAST seminar videos are available on [www.ou.edu/ieg/seminars](http://www.ou.edu/ieg/seminars).**

**Organizing Committee Chair: Jizhong Zhou (University of Oklahoma, USA; [www.ou.edu/ieg](http://www.ou.edu/ieg))**  
**Xueduan Liu (Central South University, China)**

The University of Oklahoma is an equal opportunity institution. [www.ou.edu/eoo](http://www.ou.edu/eoo)