

Title **Analytics on Sustainable Human Building Ecosystem
 – A New Approach to Understand Barriers to
 Energy Efficient Buildings**

Speaker Prof. Yong X. Tao
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Date & Time Friday, October 11, 2013 4:00p.m.

Place I²CNER Hall, Ito campus, Kyushu University

Abstract Reducing waste energy consumption by making buildings more energy efficient has been touted as one of low-hanging-fruit solutions towards carbon-neutral energy societies. Yet, despite significant progress in research and technology development, adoptions of energy efficient measures in buildings are still limited. This talk explores a new interdisciplinary area, "Sustainable Human-Building Ecosystem (SHBE)," that integrates human behavioral science, social and economic sciences in tandem with sciences of building design, engineering, and metrology for data validation of building energy consumption and occupant comforts. The developed collaboration strategies and standardized data platform could lead to significant reductions of the uncertainty in predicting human adaptation to energy efficiency and sustainability of building ecosystems, which will also address fundamental questions such as "what are the benefits of sustainable building investment to people at a personal, business, or urban planning level?" A recently formed SHBE Research Coordination Network (RCN) will be introduced. This RCN aims to foster a new understanding of the complex interactions among the key elements of human-building ecosystems and to work towards a set of new theories for integration of predictive models to explore the following hypothesis: Integrating occupant behaviors with built environment performances validated from large field data sets can lead to significant reductions of the uncertainty in predictive models for human adaptation to energy efficiency and sustainability of building ecosystems. Examples of such modeling work include building physical system and environment modeling; human behavior modeling; social/policy impact modeling; dynamic life cycle assessment (LCA) and business ecosystem modeling; and model integration and validation.

About the Speaker

Dr. Yong X. Tao is ASME Fellow and Editor-in-Chief of Heat Transfer Research with more than 24 years of research and teaching experience. Prior to joining University of North Texas, he was the Associate Dean of the College of Engineering and Computing at Florida International University in Miami, and a Professor of Mechanical and Materials Engineering. As an internationally known researcher in fundamentals of thermal sciences, refrigeration system performance, and renewable energy applications in buildings, he was also Director of the Building Energy, Environment, and Conservation Systems Lab (BEECS) and Multi-Phase Thermal Engineering Lab (MPTE) at FIU.

Since 2005, he has focused on various net-zero energy building demonstration projects including an American House in Beijing, China, during the 2008 Olympics. On July 16th, 2009, Dr. Tao hosted a visit from US Secretary of Commerce Gary Locke and Secretary of Energy Steven Chu in the American House, and was praised by both Secretaries as playing "vital role in building better collaboration between the United States and China in the area of energy-efficient buildings." Recently, he leads a research coordination network (RCN) on predictive modeling of sustainable human building ecosystem (SHBE).

Host: Professor Yasuyuki Takata

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