

The Croucher Foundation Advanced Study Institute on  
**Global Water Security: Integrated Modeling and Adaptive Management**

January 8-11, 2019

The Hong Kong University of Science and Technology

***First Announcement***

Climate change, population growth and urbanization have led to grand challenges of water security and environmental degradation in many coastal cities including Hong Kong. The purpose of this ASI is twofold: (i) to review the state of the art research in several related areas of global water security and enhance inter-disciplinary awareness; (ii) to develop better engineering design and planning to enhance urban resilience against climate change.

While climate modeling and downscaling of the atmospheric data to regional hydrological scales have made much progress over the past decade, the linkage of atmospheric modeling to hydrologic modeling (catchment scale) and hydro-environmental modeling (river, estuary scale) is still in its early stages of development. There is an urgent need to review the state of the art in linking climate and hydrological modeling, to understand the use and limitations of regional climate models in hydraulic modeling for forecasting flood levels and risks, and improving urban drainage design. In addition, the use of hourly rainfall predictions to improve environmental forecasts (e.g. beach water quality) will help engender research discussions relevant to smart cities.

Improving the efficiency of water use is one way of achieving water security. New techniques of continuous monitoring and diagnosis of water consumption and pipeline faults (including leaks) via remote means and the use of inverse hydrodynamic modeling and artificial intelligence methods are under active development. A timely review of frontier developments and experiences on smart water grids would help stimulate local research for smart water management. In addition, while climate change impact in terms of changing availability of water corresponding to alternative futures are assessed, the feedbacks with energy, water quality and ecology should be accounted for in global water security.

The goal of this inter-disciplinary meeting is to update local engineers and scientists on recent developments in integrative approaches to understanding global water security. Three inter-related areas will be covered and integrated: (i) climate change induced impacts on rainfall and floods; (ii) smart water management to enhance efficiency and conservation; and (iii) systems modeling of water-energy-food nexus for linkage with water resources management and policy.



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## **Key Themes**

- Climate Change and Urban Flood Risk
- Water Security: enhancing efficiency in smart city and alternative sources
- Water Resources Management - Interdisciplinary Issues

## **Lecturers**

- Professor Klaus Fraedrich, Meteorological Institute, University of Hamburg
- Professor Yaping Shao, Institute of Geophysics and Meteorology, University of Cologne, Germany
- Professor Jim Hall, School of Geography and the Environment, University of Oxford, UK
- Professor Wang Guangqian, Department of Hydraulic Engineering, Tsinghua University, China
- Professor Peter Goodwin, President, University of Maryland Center for Environmental Science, USA and former Chief Scientist for California Delta Science
- Professor Zoran Kapelan, Professor of Urban Water Infrastructure, Delft University of Technology, Netherlands
- Professor Slobodan Simonovic, University of Western Ontario, Canada
- Professor Roger Falconer, School of Engineering, University of Cardiff, UK
- Professor Holm Tiessen, Inter-American Institute for Global Change Research, Brazil

## **Course Director**

Prof. Joseph Hun-Wei Lee (HKUST)

## **ASI Organisation**

The ASI is intended to be a high-level teaching activity where the selected topics are treated in depth by lecturers of international standing, and new advances on the subject. There will be lectures followed by case studies and group discussions. A poster session will run throughout the ASI, and field visit to related laboratories / research sites are being planned. The ASI is primarily aimed for established scientist and researchers, and a limited number of postdoctoral fellows and doctoral students actively working on related research.

## **Applications/Inquiries**

To maximize interaction between lecturers and course participants, the meeting is limited to 60 participants. Applicants should complete the attached form (please attach a one page CV stating the reasons for wishing to attend this ASI) and return to Course Director or ASI Secretariat on or before October 15, 2018.

For queries please contact the ASI Secretariat at email: [asi2019@ust.hk](mailto:asi2019@ust.hk)