大连理工大学
DALIAN UNIVERSITY OF TECHNOLOGY

海岸和近海工程国家重点实验室
STATE KEY LABORATORY OF
COASTAL AND OFFSHORE ENGINEERING

Academic Lecture II

- **Theme:** **Air Entrainment and Turbulence Characteristics in Breaking Waves**

- **Speaker:** **Prof. Pengzhi Lin, Sichuan University**

- **Time and Venue:** **2:00-4:00 pm, July 4 2019, Meeting Room A301, SLCOE**

Abstract:

The wave breaking in the surf zone generates strong turbulence and traps a large amount of air bubbles into water. The entrained air bubbles collide, merge, and collapse, with the bubble sizes ranging from tens of microns to centimeters. The bubble groups interact with the surrounding turbulent flow by exchanging energy and modifying turbulence transport characteristics. In this study, we will introduce our recent progresses on air entrainment and turbulence transport under breaking waves. The laboratory experiments were conducted to capture the flow field, air concentration and bubble group movement. The numerical model based on mixture-fluid dynamic was developed to simulate the wave breaking processes accompanied by strong air entrainment and turbulence generation. Comparisons are made between numerical results and experimental data to further explore the revised turbulence energy cascade properties in the turbulent flow containing air bubbles.

Biography:

Prof. Pengzhi Lin obtained his doctoral degree from Cornell University in 1998. He worked as a postdoctoral fellow at Cornell University and Hong Kong Polytechnic University between 1998 and 2000. From 2000 to 2007, he worked as an Assistant Professor and Associate Professor at National University of Singapore. Now he is a professor at State Key Laboratory of Hydraulics and Mountain River Engineering, Sichuan University. His research interests include hydraulic, coastal and ocean engineering. He is specialized in computational hydrodynamics and its applications in various water engineering related problems. He is the author of the book “Numerical Modeling of Water Waves” and over 80 peer-reviewed journal papers, with a total citation of around 5000 times. He is currently the Chief Editor of Applied Ocean Research and the Associate Editor for Journal of Hydro-Environment Research (IAHR), Journal of Hydraulic Engineering (ASCE), and Journal of Ocean Engineering and Marine Energy. He is also a council member of IAHR.