2009 Mechanical Engineering Special Seminar

The Department of Mechanical Engineering is pleased to host

Jannette Frandsen

Fluid-Structure Systems

Denmark

"Kinetic Modeling of Water Waves"

October 30, 2009 | DEWALT Seminar Room, 2164 Glenn Martin Hall | 10:00 am

Abstract: The common theme of this research is to address the principle challenge and scientific issue in simulation of moving interfaces, especially free surface water waves, high Reynolds number flows and the fluid interaction with fixed and moving objects. Many large flexible structures exhibit unacceptable movement in water waves and wind fields. The fluid processes and the interaction between structure and fluid are typically nonlinear.

Development of numerical models to accurately capture nonlinearities at the free surface is important in advancing research in ocean engineering and related sciences. This talk introduces and focuses on an alternative method to traditional numerical modeling, rooted in the Lattice Boltzmann equations, to examine the underlying physics of breaking waves, and bluff-body boundary layers. Highlight of achievements and work in progress will be demonstrated through a variety of test cases including the treatment of shocks (bores) and long wave run-up.

Biography: Jannette Frandsen received her B.Sc. from the Technical University of Denmark, M.Sc. from Imperial College London and the doctorate at Cambridge. She was appointed a Departmental Lecturership at Oxford and concurrently held a Fellowship at Oriel College. She has also taught and undertaken research in USA, U.K. and Australia. She was awarded the US NSF CAREER Award in 2004. She has been well funded in particular in the USA. Her teaching and research interests are in the areas of fluid dynamics, nonlinear free-surface water waves, bluff-body aerodynamics and fluid-structure interactions. She has more than 50 publications and has given about 100 talks worldwide including 30 invited presentations.

Underpinning her academic experience, Dr. Frandsen spends several years working in industry. In 1988, she joined Hoejgaard and Schultz, Denmark, working on structural mechanics problem. Later, she was appointed a structural mechanics position at Kvaerner Earl & Wright where she got involved with conceptual and detailed analysis/design of fixed and floating offshore platforms. Hereafter, she worked for Tarmac Black and Veatch and Dar-Al-Handasah (U.K.) where she undertook analysis and design of bridges, harbor and military structures. She has also worked on joint venture, offshore marine structural projects, in Norway, Singapore and Australia. Currently, she serves as a consultant, in Europe, on industry related applications in ocean/coastal engrg. and wind energy.

For more information, please visit: www.enme.umd.edu

Dr. Frandsen will be hosted by Professor Jim Duncan of Mechanical Engineering