



**UNIVERSITY OF MICHIGAN
COLLEGE OF ENGINEERING**

Department of Naval Architecture and Marine Engineering

cordially invites you to attend

***THE CAPTAIN RALPH R. AND FLORENCE
PEACHMAN LECTURE***

presented by

Dick K.P. Yue, Sc.D.

*Philip J. Solondz Professor of Engineering
Mechanical and Ocean Engineering
Massachusetts Institute of Technology*

***“Large –Scale Ocean Wave Simulations for Ship
Operations and Motions Analysis”***

Thursday, October 29, 2009

4 pm

Gerald R. Ford Presidential Library and Museum*

****Reception immediately following***

Please RSVP to Kay Drake kdrake@umich.edu or (734) 936-7636

Abstract: Recent advances in the understanding and modeling of nonlinear wave evolution, in computational algorithms, in capabilities of modern high-performance computing platforms, and in sensing technology providing high-resolution whole-field measurements, have opened new possibilities for the use of large-scale direct ocean wavefield simulations to inform and support ship operations and motions analysis. Unlike traditional description based on linear statistics and spectral information, these simulations provide phased-resolved description and forecast of nonlinear ocean wavefields, obtaining detailed information for the surface elevation, velocity and pressure fields. Large-scale simulations based on specification of the design sea state or on direct wave (and wind) measurements have now been performed for domains of $O(10^{3-4})$ km². These simulations have been used to provide guidance and optimization for ship operations and path selection. Ensembles of such wavefield datasets have also been instrumental to understanding the mechanisms and quantifying the probability for the occurrence of rogue waves in the ocean.

