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Dick K.-P. Yue

*Philip J. Solondz Professor of Engineering
Professor of Mechanical and Ocean Engineering
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People

FACULTY
EMERITUS FACULTY
ADMIN STAFF
TEACHING STAFF
LECTURERS
RESEARCH STAFF
TECHNICAL STAFF
SUPPORT STAFF
POSTDOCS
VISITORS
FACULTY CLOUD

Administrative Contact:

Maria Riefstahl
Room 5-228
Phone: 617-253-4330
Email: maria@mit.edu

Education:

Sc.D. 1980. Theoretical and computational wave hydrodynamics. M.I.T.
S.M. 1976. Coastal engineering and wave hydromechanics. Civil & Environmental Engineering. M.I.T.
S.B. 1974. Structural and continuum mechanics. Civil & Environmental Engineering. M.I.T.

MIT Faculty Appointments:

Jan 1983: Assistant Professor
Jul 1984 - June 1986: Henry L. Doherty Assistant Professor
Jul 1987: Associate Professor
Jul 1989: Associate Professor with Tenure
Jul 1994 - present: Professor with Tenure
Sep 1999 - Dec 2007: Associate Dean of Engineering
Jul 2007 - present: Philip J. Solondz Professor of Engineering

Other Related Experience:

1973-1973: Engineering Computer Int'l (EIC) Staff Consultant
1980-1983: Science Applications International Corp. (SAIC) Senior Research Scientist

Consulting Record:

Advanced Marine Technology (AMT), Cambridge, MA
Aker Engineering as., Oslo, NORWAY
Cambridge Advanced Technology and Simulation (CATS), Cambridge, MA
Chevron Corporation, Offshore and Frontier Technology, San Ramon, CA
Chevron Oil Field Research Company, La Habra, CA.
Conoco, Inc., Houston, TX
Exxon Production Research Company, Houston, TX.

Select Research Interests: <http://web.mit.edu/vfrl/www/>

Select Referred Journal Publications of D. K.-P. Yue (2009 -)

1. " Bragg resonance of waves in a two-layer fluid propagating over bottom ripples. Part I. Perturbation analysis," *Journal of Fluid Mechanics*, **624**: 191-224 (2009) (with Alam, R. & Liu, Y.).
2. " Bragg resonance of waves in a two-layer fluid propagating over bottom ripples. Part II. Numerical simulation," *Journal of Fluid Mechanics*, **624**: 225-253 (2009) (with Alam, R. & Liu, Y.).
3. " Waves due to an oscillating and translating disturbance in a two-layer density stratified fluid," *Journal of Engineering Mathematics*, **65**: 179-200 (2009) (with Alam, R. & Liu, Y.).
4. " Investigation of Coupled Air-Water Turbulent Boundary Layers Using Direct Numerical Simulations," *Physics of Fluids* , **21**: 062108:1-19 (2009) (with Liu, S. et al).
5. " Cavity Dynamics in Water Entry at Low Froude Numbers," *Journal of Fluid Mechanics*, **641**: 441-461 (2009) (with Yan, H. et al).
6. "Fully-Nonlinear Computation of Water Surface Impact of Axisymmetric Bodies," *New Trends in Fluid Mechanics Research* , **5**: 292-295 (2009) (with Yan, H. & Liu, Y).
7. " Oblique sub- and super-harmonic Bragg resonance of surface waves by bottom ripples," *Journal of Fluid Mechanics*, **643**: 437-447 (2010) (with Alam, R. & Liu, Y.).
8. " Conservative Volume-of-Fluid Method for Free-Surface Simulations on Cartesian Grids," *Journal of Computational Physics*, **229**: 2853-2865 (2010). (with Weymouth, G.).
9. " Hydrodynamics of cell-cell mechanical signaling in the initial stages of aggregation," *Physical Review E*, **81**: 041920-1:16 (2010). Also, *Virtual Journal of Nanoscale Science & Technology*, **21** (19) (2010) (with Bouffanais, R.).
10. " Hydrodynamic object recognition using pressure sensing," *Proceedings of the of the Royal Society London A*, **467**: 19-38 (2011) (with Bouffanais, R. & Weymouth, G.).
11. " Transport of passive scalar in turbulent shear flow under a clean or surfactant-contaminated free surface," *Journal of Fluid Mechanics*, **670**: 527-557 (2011) (with Khakpour, H.R. & Shen, L.).
12. " Resonant wave signature of an oscillating and translating disturbance in a two-layer density stratified fluid," *Journal of Fluid Mechanics*, **675**: 477– 494 (2011) (with Alam, R. & Liu, Y.).
13. " Boundary Data Immersion Method for Cartesian-Grid Simulations of Fluid-Body Interaction Problems," *Journal of Computational Physics*, **230**: 6233-6247 (2011) (with Weymouth, G.).
14. " A model for the probability density function of downwelling irradiance under ocean waves," *Optics Express*, **19**: 17528– 17538 (2011). Also, *Virtual Journal for Biomedical Optics (VJBO)*, **6** (9) (2011) (with Shen, M. & Xu, Z.)
15. " Attenuation of short surface waves by the sea floor via nonlinear sub-harmonic interaction," *Journal of Fluid Mechanics*, **689**: 529– 540 (2011) (with Alam, R. & Liu, Y.).
16. " Recent advances in the study of optical variability in the near-surface and upper ocean," *Journal of Geophysical Research, Oceans*, **116**: (2011) (with Dickey, T. et al).
17. " Patterns and Statistics of In-Water Polarization under Conditions of Linear and Nonlinear Ocean Surface Waves," *Journal of Geophysical Research, Oceans*, **116**: (2011) (with Xu, Z. et al).

18. " Radiative Transfer in Ocean Turbulence and Its Effect on Underwater Light Field," *Journal of Geophysical Research, Oceans*, **116**: (2011) (with Xu, Z. et al).
19. " Boundary-Element Method for the Prediction of Performance of Flapping Foils with Leading Edge Separation," *Journal of Fluid Mechanics*, **698**: 446– 467 (2012) (with Pan, Y. et al).
20. " Optimal shape and motion of undulatory swimming organisms," *Proceedings of the of the Royal Society London B*, **279**:3065-3074 (2012) (with Tokic, G.).
21. " Physics-Based Learning Models for Ship Hydrodynamics," *Journal of Ship Research*, **57(1)**:1-12 (2013) (with Weymouth, G.).
22. " Air Entrainment and Multiphase Turbulence in the Bubbly Wake of a Transom Stern," *International Shipbuilding Progress*, (to appear) (with Hendrickson, K. et al).
23. " Rogue wave occurrence and dynamics by direct simulations of nonlinear wavefield evolution," *Journal of Fluid Mechanics*, **720**: 357-392 (2013) (with Xiao, W. et al).
24. " Physical limits on cellular directional mechanosensing," *Physical Review E*, **87**, **5** (2013) (with Bouffanais, R. & Sun, J.).
25. " SPH for incompressible free-surface flows. Part I: Error analysis of the basic assumptions," *Computers & Fluids*, (in press) (with Kiara, A. & Hendrickson, K.).
26. " SPH for incompressible free-surface flows. Part II: Performance of a modified SPH method," *Computers & Fluids*, (in press) (with Kiara, A. & Hendrickson, K.).

Scientific & Professional Societies:

American Physical Society: Life member

Society of Naval Architects and Marine Engineers: Life member

Honors & Awards

Peachman Distinguished Lecturer, University of Michigan, Ann Arbor (2009)

Gordon Y. Billard Award for Special Service of Outstanding Merit to MIT (2008)

Philip J. Solondz Chair Professorship of Engineering (2007 – present)

MIT Class of 1960 Innovation in Education Award and Fellowship (2006 – 2008)

Visiting Professor, Norwegian University of Science & Tech (2002 – present)

Visiting Professor, Stanford University (1996 – 1997)

Visiting Professor, National Taiwan University (1996 – 1997)

Visiting Scientist, Academia Sinica (1996 – 1997)

ABS J.Linnard Prize for best paper in the Transactions of SNAME (1996)

Visiting Professor, National Technical University of Athens (1995)

Guest Investigator, Woods Hole Oceanographic Institution (1993 – present)

Visiting Associate Professor, Scripps Institute of Oceanography (1989 – 1990)

Japanese Government Foreign Specialist Research Award (1987)

Henry L. Doherty Chair Professorship (1984 – 1986)

Arthur T. Ippen Fellow (1976)

Institutional and Professional Service in the last five years:

Director of International Programs, MIT School of Engineering

Director Singapore-MIT Alliance (SMA)

Associate Director, Singapore-MIT Alliance for Research & Technology (SMART)

Associate Dean of Engineering, MIT School of Engineering

Director, MIT School of Engineering Professional Education Programs (PEP)

Faculty Director, MIT School of Engr. Undergraduate Practice Opportunities Program (UPOP)

Director, MIT Vortical Flow Research Laboratory (VFRL)

Associate Director, MIT Ocean Engineering Testing Tank Facility

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