

## Professor Ronald W. Yeung, Ph.D.

### Curriculum Vitae

#### Education

University of California, Berkeley: Ph.D. in Engineering	December 1973
University of California, Berkeley: M.S. (Naval Architecture)	June 1970
University of California, Berkeley: B.S.* (Mechanical Engineering), * University Gold Medalist	June 1968

#### Positions Held

Inaugural Faculty Holder of the <a href="#">American Bureau of Shipping Endowed Chair</a> in Ocean Engineering	2012 -
Distinguished Professor, University of California at Berkeley	1994 - present
Professor of Hydromechanics & Ocean Engineering, University of Calif. at Berkeley	1982 - present
Alexander v. Humboldt Professor, Gerhard Mercator University of Duisburg, Germany	Fall 1998
Visiting Professor, Center of Excellence for Ship and Offshore Structures (CESOS), Norwegian University of Science and Technology, Trondheim, Norway.	Spring, 2007
Chair, Naval Arch. & Offshore Engineering, University of California at Berkeley	1989 - 1997
Visiting Professor, Kyushu Institute of Applied Mechanics, Kyushu University, Japan	April 1998
Humboldt Professor, Institut für Schiffbau, University of Hamburg, W. Germany	1988 - Jan 1989
Fulbright-Hayes Senior Scholar, University of Adelaide, S. Australia	Jan - May 1981
Associate Professor of Naval Architecture (with tenure), Mass. Inst. of Tech., MA	1980 - 1982
Assistant / Associate Professor of Naval Architecture, Mass. Inst. of Tech., MA	1974 -78 / 1978-80
Research Associate, Dept. of Ocean Engineering, Mass. Inst. of Tech., MA	1973 - 1974
Instructor, University of California Los Angeles Extension, Los Angeles, CA	1971 - 1971
Naval Architect, Litton Ship Systems, Culver City, CA	1970 - 1971

#### Awards & Honors

- OOAE-ASME Lifetime Achievement Award (LTA): "In grateful recognition of significant lifetime contribution to hydromechanics and ocean engineering of a distinguished scholar" @ OMAE2016–Busan, S. Korea, 6/21/16*  
*Captain Ralph R. & Florence Peachman Lecturer, University of Michigan, April 13, 2016*  
 Honoree: *OMAE-2012 Special Symposium in Honor of Ronald W. Yeung on Offshore and Ship Hydrodynamics, July 1-6, 2012, Rio de Janeiro, Brazil.*
- Honorary Professor, Conferred May 12, 2010, Harbin Engineering University, Harbin China.
- SOBENA International Researcher Award 2008, Sociedade Brasileira de Engenharia Naval ("SOBENA"), Brazilian Society of Marine Engineers, Rio de Janeiro.*
- Pi Tau Sigma 2006 Professor of the Year for Excellence in Teaching, Pi Tau Sigma National Honor Society of Mechanical Engineering, Pi-Omega Chapter, University of California at Berkeley.*
- Bill Zimmie Award and Lecturer, 2006 of The University of Michigan, Ann Arbor for Support of Marine Education.*
- Kenneth Davidson Gold Medalist, Society of Naval Architects and Marine Engineers, for Lifetime Outstanding Scientific Accomplishment in Marine Research, October 2004.*
- Georg Weinblum Lecturer, Schiffbautechnische Gesellschaft - Institut für Schiffbau (Germany) & Society of Naval Architect and Marine Engineers - Naval Studies Board of National Academy of Sciences, 2002-2003.*
- Elected Fellow, Society of Naval Architects and Marine Engineers, April 1998.*
- U.S. Distinguished Scientist Award, Alexander von Humboldt Foundation, Germany, 1988 & 1998.*
- Fulbright-Hayes Senior Scholar, University of Adelaide, South Australia, 1981.
- Selected listee: *Who's Who in the World, Who's Who in America, Who's Who in Science & Engineering, American Men & Women of Science, Who's Who in Technology, Who's Who Among Asian Americans.*
- Best Paper Award, Ocean Renewable Energy Symposium 2009, with Y.-L. Young & M. R. Motley, American Society of Mechanical Engineers (ASME), 28<sup>th</sup> International Conference of Offshore Mechanics & Arctic Engineering, Honolulu, USA.*
- Best Paper Award, J.V. Wehausen Symposium of Ship Waves, Hydrodynamics and Ocean Engineering, 2002, with Dr. J. A. Hamilton, 21st International Conference of Offshore Mechanics & Arctic Engineering, Oslo, Norway.*

*Outstanding Paper Award for Originality and Significance, 1992, with Dr. C.-F. Wu, American Society of Mechanical Engineers - Offshore Mechanics & Arctic Engineering Division, for paper entitled: "Viscosity Effects on Radiation Hydrodynamics of Two-dimensional Cylinders".*

*Supervisor of the following fourteen Best Student Paper / Best Student Project Awards:*

Mr. Dongchi Yu & Mr. Pierre Lecoindre, *Graduate Paper Honor Prize, 2016, Society of Naval Architects & Marine Engineers for paper entitled "Numerical and Experimental Analysis of Wave-Resistance Reduction of Asymmetric Di-Hull Systems by Exploiting Interference Effects", presented Mar 16, '16.*

Mr. Nathan Tom, Recipient of 2013 OMAE *Subrata Chakrabarti - Young Professional (All-Conference) Award* for his presentation and technical contribution of Paper #OMAEE2013-11247: "Non-Linear Model Predictive Control Applied to a Generic Ocean-Wave Energy Extractor," Nantes, France.

Mr. Lu Wang, *Graduate Paper Honor Prize, 2016, Society of Naval Architects & Marine Engineers for paper entitled "Nonlinear Waves Generated by a Moving Pressure Patch in Arbitrary Water Depth and the Implied Zero-Wave-Resistance (ZWR) Conditions", presented Mar 19, 2014, also published in SNAME Annual Transactions, 2014, pp. 334-350.*

Mr. Christophe Cochet, *Graduate Paper Prize, 2012, Society of Naval Architects & Marine Engineers for paper entitled "Hydrodynamic Performance of a Compound Cylinder Extracting Ocean-Wave Energy", presented Feb 22, 2012, also published in SNAME Annual Transactions, 2012, pp. 395-415*

Mr. Jonathan Elkin, *Graduate Paper Honor Prize, 2008, Society of Naval Architects & Marine Engineers for paper entitled "Hydrodynamic Peculiarities of Catamaran-Like Hull Sections."*

Mr. Robert Seah, *Graduate Paper Honor Prize, 2006, Society of Naval Architects & Marine Engineers (SNAME), for paper entitled "Resonant Modes of Rectangular Twin Hulls"*

Mr. Gregoire Poupard and Mr. Jean O. Toilliez, *Graduate Paper Honor Prize, 2004, Society of Naval Architects & Marine Engineers for paper entitled "Fast Evaluators for Optimal Multi-hull Configurations."*

Mr. Yiannis Constantinides, *Graduate Paper Honor Prize, 2002, Society of Naval Architects & Marine Engineers for paper entitled "Vortex-Induced Vibrations of Cylinders with Fins."*

Mr. Dominique Roddier & Mr. Shihwei Liao, *Graduate Paper Honor Prize, 1999, Society of Naval Architects & Marine Engineers, for paper entitled "Simulation of Breaking Waves – Theory and Experiments."*

Mr. Anthony Fotsch, *Graduate Paper Honor Prize, 1998, Society of Naval Architects & Marine Engineers for paper entitled "Inertia and Damping of Plates and Blocks in Finite-Depth Water."*

Mr. Shiwei Liao & Mr. Dominique Roddier, *Best Graduate Student Project Award, 1998, American Society of Mechanical Engineers, Ocean Engineering Division, for project and paper entitled "Generation of Plunging Breakers - Laboratory and Numerical Simulation."*

Mr. Andrew Hamilton, *Graduate Paper Honor Prize, 1995, Society of Naval Architects & Marine Engineers, for paper entitled "Shell Function Methodology for Unsteady Hydrodynamics".*

Mr. Xing Yu, *Best Graduate Student Project Award, 1993, American Society of Mechanical Engineers, Ocean Engineering Division, for project entitled "Interaction of Transient Waves with a Circular Structure".*

Mr. Craig Jimenez, *Best Graduate-Student Paper Award, 1988, Society of Naval Architects & Marine Engineers, for paper entitled "Hydrodynamics of Sail Boards".*

## Professional Activities

Chair, First Chilean Wave & Tidal Energy Workshop, Valdivia, Chile, October 29-31, 2014.

Conference Chair, ASME 33rd International Conference on Ocean, Offshore and Arctic Engineering (OMAEE2014), San Francisco, CA (1,400 attendees)

Member, International Advisory Panel for Numerical Tank Project, Harbin Engineering University, China, 2013-2014.

Member, Committee on Naval Engineering in the 21<sup>st</sup> Century, Transportation Research Board of the National Academies, 2009-2011.

National Advisory Board Member of: Univ. of Michigan, Naval Architecture and Marine Engineering (1997-); Center for Ocean Engineering, Mass. Inst. of Technology (2008-).

Member, External Review Board (2005-06) - Delft University of Technology, Marine Technology Program.

Member of: American Society of Engineering Education, Naval Architects & Marine Engineers (SNAME), Society of Naval Architects of Japan, *Tau Beta Pi, Pi Tau Sigma, Phi Beta Kappa.*

Scholarship Committee & Education Committee of SNAME; Academic Liaison & Executive Committee of Northern California Section of SNAME.

Member of Advisory Board: *Journal of Ocean Engineering and Marine Energy* (2014-), *Journal of Hydrodynamics* (2014-); Editorial Board Member: *International Journal for Computers and Fluids* (1983-), *Journal of Marine Sciences & Technology* (2005-), *Ocean Engineering Journal* (2005-2016), *Brazilian Journal of Marine Systems & Ocean Technology* (2006-), *Journal of Ship Research* (1975-1996), *Journal of Engineering Mathematics* (1986-2008).

Teaches undergraduate and graduate courses in naval architecture, ocean engineering, marine hydrodynamics, fluid mechanics, and computational methodology.

Current research interests: Ship and offshore hydromechanics, ship-shore interaction, numerical fluid mechanics, mathematical modeling, surface-waves phenomena, vortical flows, roll-motion damping, "green ship" by design, moon-pool resonance, alternative renewable marine energy. Research for publications have been sponsored by the National Science Foundation, Sea Grant Program of NOAA, Office of Naval Research, the U.S. Navy, KAUST, and marine industry.

Reviewer for: *J. Fluid Mech.*, *J. Ship Res.*, *Appl. Ocean Res.*, *J. Engrg. Math*, *Int'l J. of Computers & Fluids*, *J. Comput. Physics*, *ASME J. - OMAE*, *Int'l J. of Offshore & Polar Engrg.*, *Wave Motion*, *Int'l J. Numer. Meth. in Fluids*, *J. of Marine Sciences & Technology*, *Ocean Engineering Journal*, *J. of Marine System and Ocean Technology*, *J. Renewable Energy*, *J. Applied Energy*, *National Science Foundation*, *California Inst. of Energy Research*, *Naval Studies Board*, *Australian Research Council*.

Expert witness: ship-ship interaction hydrodynamics. Principal of "Ronald W. Yeung, Consulting Naval Architect & Ocean Engineer" - provides services for marine and coastal related technical issues, various private firms and government agencies.

## Fund-Raising

One of two principal faculty members to solicit an American Bureau of Shipping Endowment of \$4.5 million for Ocean Engineering at UC Berkeley.

Initiated and mobilized the establishment of the John V. Wehausen Memorial Graduate Scholarship in 2006, present value of endowment ~\$200K.

## Selected Key Publications

Yeung, R. W., "Sinkage and Trim in First-Order Thin-Ship Theory", *Journal of Ship Research*, vol. 16, no. 1, pp. 47-59, March 1972.

Yeung, R. W., "A Singularity-Distribution Method for Free-Surface Flow Problems with an Oscillating Body", Report NA73-6, College of Engineering, University of California, Berkeley, 124 pp., August 1973.

Cummings, D., Yeung, R. W., Kern, E., and Shursky, S., "Mathematical Model of an Air-Cushion Vehicle", Tech. Report 73-C-0138-1, Naval Training Equipment Center, Orlando, Florida, Dec. 1973.

Sibul, O. J., Yeung, R. W., Scragg C., and Webster W. C., "Prediction of Sinkage and Trim for Ships", Report NA74-1, College of Engineering, University of California, Berkeley, CA, January, 1974.

Yeung, R. W and Bai, K. J., " Numerical Solutions to Free-Surface Flow Problems", *Proceedings*, 10th Symp. on Naval Hydrodynamics, Cambridge, MA, pp. 609-646, 1974.

Yeung, R. W., "A Hybrid Integral-Equation Method for Time-Harmonic Free-Surface Flows", *Proceedings*, 1st International Conference on Numerical Ship Hydrodynamics, Gaithersburg, Maryland, pp. 581-607, Oct, 1975.

Yeung, R. W., "Surface Waves due to a Maneuvering Air-Cushion Vehicle", *Journal of Ship Research*, vol. 19, no. 4, pp. 581-607, 1975.

Yeung, R. W., "Documentation of Four Ocean-related Computer Modules", Report MITSG 76-18, MIT Sea Grant Program, Mass Inst. of Tech., Cambridge, MA, 67 pp, November, 1976.

Yeung, R. W., and Hwang, W. Y., "Nearfield Hydrodynamic Interactions of Ships in Shallow Water", *Journal of Hydronautics*, vol 11, no. 4, pp. 128-135, 1977.

Yeung, R. W., "On the Interaction of Slender Ships in Shallow Water", *Journal of Fluid Mechanics*, vol. 85, part 1, pp. 143-159, 1978.

Yeung, R. W., and Bouger, Y. C., "A Hybrid Integral-Equation Method for Two-Dimensional Ship Waves", *Proceedings*, 2nd Int'l Conf. on Numerical Ship Hydrodynamics, Berkeley, CA, pp. 160-175, September, 1979.

- Yeung, R. W., "Applications of Slender Body Theory to Ships Moving in Restricted Shallow Water", *Proceedings, Int'l Symp. on Aspects of Navigability*, Delft, The Netherlands, vol. 3, Paper 28, April, 1978.
- Yeung, R. W. and Y. C. Bouger, "A Hybrid Integral-Equation Method for Two-Dimensional Ship Waves", *International Journal for Numerical. Methods in Engineering*, vol 14, pp. 317-336, 1979.
- Yeung, R. W. and Tan, W. T., "Hydrodynamic Interaction of Ships with Obstacles in Shallow Water", *Journal of Ship Research*, vol. 24, no. 1, pp. 50-59, 1980.
- Yeung, R. W., "Added Mass and Damping of a Vertical Cylinder in Finite-Depth Waters", *Applied Ocean Research*, vol. 3, no. 3, pp. 119-133, 1981.
- Yeung, R. W., "Numerical Methods in Free-Surface Flows", Report Y81-01, Dept. of Applied Mathematics, University of Adelaide, Adelaide, South Australia, April, 1981.
- Yeung, R. W. and S. H. Kim, "Radiation Forces on Ships with Forward Speeds", *Proceedings, 3rd International Conference on Numerical Ship Hydrodynamics*, Paris, France, pp. 499-515, June, 1981.
- Yeung, R. W., "The Transient Heaving Motion of Floating Cylinders", *Journal of Engineering Mathematics*, vol. 16, no. 2, pp. 97-119, 1982.
- Yeung, R. W., "Numerical Methods in Free-Surface Flows", *Annual Review of Fluid Mechanics*, vol. 14, pp. 395-442, 1982.
- Tuck, E. O., Yeung, R. W., and Helfgott, A., "Cambered (Heart) Valve Leaflets that Maximize Initial Rate of Closure", *Journal of Fluid Mechanics*, vol. 121, pp. 517-529, 1982.
- Yeung, R. W., *The International Workshop on Ship and Platform Motions*, editor., Univ. of Calif. Press, October 1983, 605 p.
- Yeung, R. W., and Kim, S. H., "A New Development in the Theory of Oscillating and Translating Slender Ships", *Proceedings, 15th Symp. on Naval Hydrodyn.*, Hamburg, W. Germany, pp. 195-212, 1984.
- Mei, C. C., Yeung, R. W., and K.-F. Liu "Lifting of a Large Object from a Seabed", *Journal of Fluid Mechanics*, vol. 152, pp. 203-215, 1985.
- Yeung, R. W., "A Comparative Evaluation of Numerical Methods in Free-Surface Flows", Invited review, *Proceedings, IUTAM Symp. on Hydrodynamics of Utilization of Ocean-Wave Energy*, Lisbon, Portugal, pp. 325-356, July 1985.
- Grosenbaugh, M. A. and Yeung, R. W., "Flow Structure Near a Ship Bow - an Experimental Investigation", Rept. NA85-1, Dept. of Naval Arch. & Offshore Engineering, University of California, Berkeley, CA, October 1985.
- Liou, G-S., Penzien, J., and Yeung, R. W., "Response of Tension-Leg Platforms to Vertical Seismic Excitations", Rept. UCB/EERC-85-14, Earthquake Engineering Research Center, Univ. of California, Berkeley, CA, December 1985.
- Liou, G-S., Penzien, J., and Yeung, R. W., "Dynamic Response of Tension Leg Platforms to Seismic Excitations", *Proceedings, 5th International Offshore Mechanics & Arctic Engineering Conference*, Tokyo, Japan, 1986.
- Wu, C-F. and Yeung, R. W., "Nonlinear Wave-Body Motion in a Closed Domain", *Proceedings, 2nd Int'l. Workshop on Water Waves & Floating Bodies*, Univ. of Bristol, England, February 1987.
- Liou, G-S., Penzien, J., and Yeung, R. W., "Response of Tension Leg Platforms to Vertical Seismic Excitations", with *Earthquake Engineering and Structural Dynamics*, vol. 16, pp. 157-182, 1988.
- Grosenbaugh, M. A. and Yeung, R. W., "Nonlinear Free-surface Flows at a Two-dimensional Bow", , *Proceedings, 3rd International Workshop on Water Waves & Floating Bodies*, Woods Hole, MA, April 1988.
- Grosenbaugh, M. A. and Yeung, R. W., "Nonlinear Bow Flows: An Experimental and Theoretical Investigations", *Proceedings, 17th Symp. on Naval Hydrodynamics*, Den Haag, The Netherlands, 1988.
- Ananthakrishnan P. and Yeung, R. W., "Solution of Nonlinear Water-wave and Wave-body Interaction Problems using a new Boundary-fitted Coordinate Method", *Proceedings, 4<sup>th</sup> International Workshop on Water Waves & Floating Bodies*, Øystese, Norway, May 1989.
- Yeung, R. W. and Sphaier, S. H., "Wave-Interference Effects on a Truncated Cylinder in a Channel", *Journal of Engineering Mathematics*, vol. 23, pp. 95-117, 1989.

- Grosenbaugh M. A. and Yeung, R. W., "Flow Structure near the Bow of a Two-Dimensional Body", *Journal of Ship Research*, vol 33, no. 4, pp. 269-283, 1989.
- Wu C.-F. and Yeung, R. W., "Nonlinear Wave-Body Motions in a Closed Domain", with C-F. Wu, *International Journal of Computers & Fluids*, vol. 17, no. 2, pp. 351-370, 1989.
- Yeung, R. W. and Sphaier, S. H., "Wave-Interference Effects on a Floating Body in a Towing Tank", with S. H. Sphaier, *Proceedings, 4th International Symposium on Practical Design of Ships & Mobile Units*, Varna, Bulgaria, Paper 95, October 1989.
- Grosenbaugh M. A. and Yeung, R. W., "Nonlinear Free-surface Flows at a Two-dimensional Bow", *Journal of Fluid Mechanics*, vol. 209, pp. 57-75, 1989.
- Yeung, R. W. and Wu C.-F., "Über nichtlineare Wellenbewegung in einem geschlossenen Gebiet", *Jahrbuch der Schiffbau-technischen Gesellschaft*, Band 83, pp. 29-41, 1989.
- Vaidhyanathan M. and Yeung, R. W., "Wave Diffraction over Submerged Obstacles", *Proceedings, 5th International Workshop on Water Waves & Floating Bodies*, Manchester, England, March 1990.
- Ananthakrishnan P. and Yeung, R. W., "Large-Amplitude Oscillation of Two-dimensional bodies in a Viscous Fluid with a Free Surface," *Proceedings, 6th International Workshop on Water Waves & Floating Bodies*, Woods Hole, MA, April 1991.
- Yeung, R. W., "Nonlinear Bow and Stern Waves - Inviscid and Viscous Solutions", Chapter 26 in *Mathematical Approaches in Hydrodynamics*, SIAM Publisher, Philadelphia, PA, May, 1991.
- Yeung, R. W. and Wu, C-F. "Viscosity Effects on the Radiation Hydrodynamics of Two-dimensional Cylinders," *Proceedings, 10th International Offshore Mechanics & Arctic Engineering Conference*, Stavanger, Norway, 1991.
- Yeung, R. W. and Chau, F. P., "Motion of a Barge in Regular and Irregular Waves", Report NAOE 91-1, Dept of Naval Architecture & Offshore Engineering, Univ. of California, Berkeley, June 1991.
- Yeung, R. W. and Wu, C-F., "Viscosity Effects on the Radiation Hydrodynamics of Horizontal Cylinders", *Journal of Offshore Mechanics & Arctic Engineering*, vol. 113, pp. 334-343, 1991.
- Yeung, R. W. and Ananthakrishnan, P., "Oscillation of a Floating Body in a Viscous Fluid", with, *Journal of Engineering Mathematics*, vol. 26, pp. 211-230, 1992.
- Vaidhyanathan, M. and Yeung, R. W., "Non-linear Interaction of Water Waves with Submerged Obstacles", *International Journal for Numerical Methods in Fluids*, vol. 14, pp. 1111-1130, 1992.
- Ananthakrishnan P. and Yeung, R. W., "Oscillation of a Slightly Submerged Cylinder in a Viscous Fluid", *Proceedings, 7th Int. Workshop on Water Waves & Floating Bodies*, Val de Reuil, France, May 1992.
- Yeung, R. W. and Vaidhyanathan, M., "Unsteady Separated Flows About Blunt Bodies", *Proceedings, 2nd International Offshore & Polar Engineering Conference*, San Francisco, June 1992.
- Vaidhyanathan, M. and Yeung, R. W., "Nonlinear Diffraction of Surface Waves over a Submerged Cylinder", *Proceedings, 5th Asian Congress of Fluid Mechanics*, Taejon, S. Korea, August 1992.
- Yeung, R. W. and Ananthakrishnan, P., "Vortical Flows With and Without a Surface-Piercing Body", *Proceedings, 19th Symposium on Naval Hydrodynamics*, Seoul, S. Korea, August 1992.
- Yeung, R. W., Sphaier, S. H., and M. Vaidhyanathan, "Unsteady Flows About Bluff Cylinders", *International Journal of Offshore & Polar Engineering*, vol. 3, no. 2, pp. 81-92, 1993.
- Cermelli, C. and Yeung, R. W., "Shell Functions: A Global Method for Computing Time-Dependent Free-surface Flows", with C. Cermelli, *Proceedings, 8th Int. Workshop on Water Waves & Floating Bodies*, St. Johns, Newfoundland, Canada, May 1993.
- Yeung, R. W. and Vaidhyanathan, M., "Flow Past Oscillating Cylinders", with M. Vaidhyanathan, *Proceedings, 12th International Offshore Mechanics & Arctic Engineering (OMAE) Conference*, Glasgow, Scotland, June, 1993; also *ASME Journal of Offshore Mechanics and Arctic Engineering*, v. 115, no. 4, pp. 197-205, 1993.
- Yu, X., Ananthakrishnan, P., and Yeung, R. W., "Interaction of Transient Waves with a Circular Surface-Piercing Structure", Report NAOE 93-1, Naval Architecture & Offshore Engineering, University of California, Berkeley, August 1993.
- Yu, X. and Yeung, R. W., "Transient Waves Near a Circular Cylinder in Closed and Open Domains", *Proceedings, 9th International Workshop on Water Waves and Floating Bodies*, Kuju, Japan, April 1994.

- Ananthkrishnan P. and Yeung, R. W., "Free-Surface and Submerged-Body Interactions in a Viscous Fluid", *Symposium on Vorticity and Free-Surface Interactions*, 12th US. National Congress of Applied Mechanics, Seattle, Washington, June 1994.
- Vaidhyanathan, M. and Yeung, R. W., "Wave Effects on Separated Flow about Bodies in a Free Surface", *Symposium on Vorticity and Free-Surface Interactions*, 12th U.S. National Congress of Applied Mechanics, Seattle, Washington, June 1994.
- Ananthkrishnan P. and Yeung, R. W., "Nonlinear Interaction of a Vortex Pair with Clean and Surfactant-covered Free Surfaces", *Wave Motion*, vol. 19, pp. 343-365, 1994.
- Yeung, R. W. and Yu, X., "Three-Dimensional Flow Around a Surface-Piercing Body", with X. Yu, *Proceedings*, 20th Symposium on Naval Hydrodynamics, Santa Barbara, CA, August 1994.
- Yeung, R. W. and Vaidhyanathan, M., "Highly Separated Flows Near a Free Surface", *Proceedings*, International Conference on Hydrodynamics, Wuxi, China, October 1994.
- Yu, X. and Yeung, R. W., "Interaction of Transient Waves with a Circular Surface-Piercing Body", *ASME Journal of Fluid Engineering*, vol. 11, no. 9, 382-388, 1995.
- Yu, X. and Yeung, R. W., "Unsteady Waves Near a Circular Cylinder in a Viscous Fluid", *Proceedings*, 10th International Workshop on Water Waves and Floating Bodies, Oxford, England, April 1995.
- Yeung, R. W. and Yu, X., "Wave-Structure Interaction in a Viscous Fluid", *Proceedings*, 14th International Offshore Mechanics & Arctic Engineering (OMAE) Conference, Copenhagen, Denmark, June 1995.
- Yeung, R.W., "3-D Interaction of Surface Waves with a Cylinder in a Viscous Fluid", *Proceedings*, International Congress of Industrial and Applied Mathematics - 96, Hamburg, Germany, July 1995.
- Yeung, R. W., Cermelli C. and Liao, S.-W. "Vorticity Fields Due to Rolling Bodies in a Free Surface - Experiment and Theory", *Proceedings*, 21st Symposium on Naval Hydrodynamics, Trondheim, Norway, June 1996.
- Hamilton, J. A. and Yeung, R. W., "Shell-Function Solutions for Three-Dimensional Nonlinear Body-Motion Problems", *Schiffstechnik*, Band 44, No. 1, pp. 62-70, 1997.
- Yeung, R. W. and Ananthkrishnan, P., "Viscosity and Surface-Tension Effects on Wave Generation by Translating Bodies", *Journal of Engineering Mathematics*, vol. 32, pp. 257-280, 1997.
- Nguyen, T. C. and Yeung, R. W., "Steady Waves Systems in a Two-Layer Fluid of Finite Depth", *Proceedings*, 12th International Workshop on Water Waves and Floating Bodies, Marseille, France, March 1997.
- Yeung, R. W. and Cermelli, C., "Vortical Flow Generated by a Rolling Plate in a Free Surface", in *Advances in Fluid Mechanics*, Chapter 1, Computational Mechanics Publisher, pp. 1-35, 1998.
- Yeung, R. W., Liao, S.-W. and Roddier D., "On Roll Hydrodynamics of Rectangular Cylinders", *Proceedings*, 8th International Conference of Society of Offshore and Polar Engineers, vol. III, pp 445-453, Montreal, 1998.
- Nguyen, T. C. and Yeung, R. W., "Radiation and Diffraction of Waves in a Two-Layer Fluid", *Proceedings*, 22nd Symposium on Naval Hydrodynamics, Washington, DC, August 1998.
- Yeung, R. W. and Kim, J. W., "Structural Drag and Deformation of a Moving Load on a Floating Plate", *Proceedings*, 2nd International Conference on Hydroelasticity in Marine Technology, Fukuoka, Japan, pp. 77-88, December 1998.
- Yeung, R. W., Liao S.-W., and D. Roddier, D., "Hydrodynamic Coefficients of Rolling Rectangular Cylinders", *International Journal of Offshore and Polar Engineers*, vol. 9, no. 4., pp. 241-250, 1998.
- Yeung, R. W. and Nguyen, T. C., "Waves Generated by a Moving Source in a Two-Layer Ocean of Finite Depth", *Journal of Engineering Mathematics*, vol. 35, no. 1-2, pp. 85-107, 1999.
- Yeung, R. W., "Special Issue on Ocean Mechanics - and a Dedication to Sir James Lighthill", *Journal of Engineering Mathematics*, vol. 35, no. 1-2, pp. 1-4, 1999.
- Yeung, R. W., *Special Issue on Ocean Mechanics*, Journal of Engineering Mathematics, Editor, with J. N. Newman, Vol. 35, no. 1-2, 250 p, 1999.
- Liao, S.-W. and Roddier, D. and Yeung, R. W., "Interaction of Regular and Extreme Waves with Submerged Cylinders", *Proceedings*, 14th International Workshop of Water Waves and Floating Bodies, Port Huron, Michigan, April 1999.

- Yeung, R. W. and Liao, S.-W., "Time-Domain Solution of Freely-Floating Cylinders in a Viscous Fluid", with S.-W. Liao, *Proceedings*, 9th International Conference of Society of Offshore and Polar Engineers, vol. III, pp. 454-462, Brest, France, May 1999.
- Hamilton, J. A. and Yeung, R. W., "Nonlinear Motion of a Submerged Body in Waves", *Proceedings*, 15th International Workshop of Water Waves and Floating Bodies, Caesarea, Israel, February 2000.
- Yeung, R. W., Roddier D., and S.-W. Liao S.-W., "On Freely-Floating Cylinders Fitted with Bilge Keels", *Proceedings*, 10th International Conference of Society of Offshore and Polar Engineers, Seattle, USA, May 2000.
- Yeung, R. W., Roddier, D., Alessandrini, B., Gentaz, L. V., and. Liao S.-W., "On Roll Hydrodynamics of Cylinders Fitted with Bilge Keels", *Proceedings*, 23rd Symposium on Naval Hydrodynamics, Val de Reuil, France, September 2000.
- Yeung, R. W. and Kim, J. W., "Effects of a Translating Load on a Floating Plate – Structural Drag and Plate Deformation", *Journal of Fluids and Structures*, vol. 14, pp. 993-1011, 2000.
- Yeung, R. W. and Liao, S.W., "Investigation of the Mathieu Instability of Roll Motion by a Time-Domain Viscous-Fluid Method", *Proceedings*, 16th Int'l Workshop of Water Waves and Floating Bodies, Hiroshima, Japan, April 2001.
- Yeung, R. W. and Yu, X., "Three-Dimensional Free-Surface Flow with Viscosity – A Spectral Solution", with X. Yu, *Hydrodynamics in Ship and Ocean Engineering*, Special Volume in Honor of M. Ohkusu, RIAM, Kyushu University Publisher, Fukuoka, Japan, April 2001, pp. 87-115.
- Yeung, R. W., Seah R. K.M., and Constantinides, Y., "Roll Damping of Ship Sections with Bilge Keels", Report # OEGG02-1, Ocean Engineering Graduate Group, University of California at Berkeley, iii+50pp. February 2002.
- Yeung, R. W., Seah R. K.M., and Celano T., "The Roll Decay of Floating Cylinders with Bilge Keels", *Proceedings*, 17th International Workshop of Water Waves and Floating Bodies, Cambridge, England, April 2002.
- Yeung, R. W. and Hamilton, J. A., "A Perfectly Transparent Spectral Shell for Unsteady Wave-Body Interaction", *Proceedings* of 21<sup>st</sup> International Conference on Offshore Mechanics and Arctic Engineering, Oslo, Norway, June 2002.
- Yeung, R. W. "Fluid Dynamics of Finned Bodies - From VIV to FPSO", Plenary Lecture, *Proceedings*, 12th Conference of the International Society of Offshore and Polar Engineers, ISOPE 2002, Kitakyushu, Japan, Vol. 2, pp 1-11, May 2002.
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## Doctoral Dissertation Supervision & Titles

- Romeo H. Bruce, "Dynamics, Simulation and Control of Surface-Effect Ship in Heave, Surge, and Pitch", Ph.D. 1977. Dr. Bruce is a staff member of the Research & Development Department of the Navy of the Philippines, Manila.
- Ki-Han Kim, "Optimal Ship Forms for Minimum Bow Waves, Ph.D. 1977. Dr. Kim is a Program Manager of the Office of Naval Research, Arlington, VA.
- Paul D. Scavounos, "On the Diffraction of Free-Surface Waves by a Slender Ship", Ph.D. 1981. Dr. Scavounos is a Professor of ocean engineering at the Massachusetts Institute of Technology, Cambridge, Massachusetts.
- Sea-Heon Kim, "Slender Ships with Forward Speed - a New Approach and a New Theory", Ph.D. 1982. Dr. Kim is a consultant in San Jose, California.
- Ming-Yao, Lee, "Unsteady Fluid-Structure Interaction in Water of Finite Depth", Ph.D. 1985. Dr. Lee is a Program Leader at Chevron Energy Technology Co., Houston, Texas.
- Mark Grosenbaugh, "Nonlinear Flow at the Bow of a Ship - an Experimental and Theoretical Investigation", Ph.D. 1987. Dr. Grosenbaugh was a senior scientist at the Woods Hole Oceanographic Institution (Deep Submergence Group), Woods Hole, Massachusetts, before his passing in August 2012.
- Petri Valanto, "Experimental and Theoretical Investigation of the Ice-breaking Cycle, in Two Dimensions", Ph.D. 1989. Dr. Valanto is a Director at the Hamburg Schiffbau Versuch Anstalt (HSVA), Hamburg, Germany.
- Chun-fa Wu, "Wave-Viscosity Interaction for Bodies in a Free Surface", Ph.D. 1990. Dr. Wu is a principal of Sea Engineering and Vice-President of Intersea WorleyParsons Inc., Houston, Texas.
- P. Ananthakrishnan, "Nonlinear Flows about a Translating Surface-Piercing Body - Effects of Viscosity", Ph.D. 1991. Dr. Ananthakrishnan is an adjunct professor at Florida Atlantic University, Department of Ocean Engineering, Boca Raton, Florida, and a professor at the Indian Institute of Technology, Madras, India.
- M. Vaidyanathan, "Separated Flows Near a Free Surface", Ph.D. 1993. Dr. Vaidyanathan is a consultant at Energy & Environmental Economics in San Francisco, California.
- Scott Coakley, "A Uniform Bi-Cubic Surface Spline Method for Free-Surface Flows", Ph.D. 1995. Dr. Coakley is a staff scientist at Exponent Failure Analysis Associates, Mountain View, California.
- Christian Cermelli, "Vortical Flows Generated by a Rolling Plate in a Free Surface", Ph.D. 1995. Dr. Cermelli is an owner and president of Marine Innovation and Technology, San Francisco, California and Marseilles, France
- Xing Yu, "Free-Surface Flow Around a Vertical Strut in a Real Fluid", Ph.D. 1996. Dr. Yu is the owner of the Computer & Power Automation, Shanghai, China.
- Thai Nguyen, "Three-Dimensional Green's Functions for in a Two-Layer Fluid of Finite Depth", Ph.D. 1998. Dr. Nguyen is a senior staff researcher at the Coastal Systems of Naval Surface Weapon Center of the U.S. Navy, Panama City, Florida.

- Dominique Roddier, "Hydrodynamics of Rolling Cylinder With and Without Bilge Keels", Ph.D. 2000. Dr. Roddier is CTO of Principle Power Inc., Emeryville, California, well known for his "WindFloat" floating offshore wind-turbine development.
- Shihwei Liao, "Development & Applications of the Free-Surface Random Vortex Method (FSRVM)", Ph.D. 2000. Dr. Liao was senior naval architect at Conoco-Phillips, Houston, Texas, before his passing in December 2009.
- J. Andrew Hamilton, "Viscous and Inviscid Matching for Wave-Body Interaction Problems", Ph.D. 2002. Dr. Hamilton is a staff research scientist at the Monterey Bay Aquarium Research Institute, Monterey, California.
- Robert K. M. Seah, "The SS-FSRVM Computational Model for Three-Dimensional Ship Flows with Viscosity", Ph.D. 2007. Dr. Seah is a senior staff researcher at Chevron Energy Technology Corporation, Houston, Texas.
- Hui Wan, "Interactions of Multiple Bodies in a Free Surface with Consideration of Cross Flow", Ph.D. 2008. Dr. Wan is a CFD staff specialist in fluid-dynamics simulation at the Air Force Research Laboratory (AFRL) of the Wright-Patterson Air Force Base, Dayton, Ohio.
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- Yichen Jiang, "Three-Dimensional Computational Modeling of Multi-DOF Ship Motion in a Viscous Fluid", Ph.D. 2014. Prof. Jiang is an associate professor at Dalian University of Technology, China, after 2 years of post-doc at the Marine Mechanics Laboratory of Univ. Calif. at Berkeley.
- Samuel A. Kanner, "Design, Analysis, Hybrid Testing and Power Optimization of a Semi-Submersible Platform with Counter-Rotating Vertical-Axis Wind Turbines," Ph.D. 2015. Dr. Kanner is now a staff member of Principle Power Inc., Emeryville, CA.
- Lu Wang, "High-Performance Discrete-Vortex Algorithms for Unsteady Viscous-Fluid Flows near Moving Boundaries," Ph.D. 2016. Dr. Wang is planning to be a Post-doctoral Fellow at UC-Berkeley
- Farshad Madhi, "Operational Control and Survivability Enhancement of Asymmetric Wave-Energy Converters", Ph.D. 2016. Dr. Madhi is a practicing Consultant in the State of California.
- Daewoong Son, "Performance Evaluation and Optimization of a Dual Coaxial-Cylinder System as an Ocean-Wave Energy Converter", Ph.D. 2016. Dr. Son is now a staff scientist at *RE-Vision*, Consulting Company for Renewable Energy, Sacramento, CA.

*R. W. Yeung has also supervised more than 80 Master of Science and Master of Engineering theses and mentored another 2 dozens visiting students and scholars. Further details are available upon request.*

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**Current Entities with Research Collaboration:** University of Michigan, Tianjin University (China), Technical University of Denmark (Denmark), Cheng Kung University (Taiwan), University Austral of Chile, Valdivia, (Chile), Harbin Engineering University (China), Dalian Maritime University (Dalian, China), University of Ireland, Galway (Ireland), Shanghai Jiao Tong University (China), University of Strathclyde (Scotland)

## Research Highlights and Original Contributions

- *Sinkage and trim of realistic ship hulls* - the first theoretical prediction in literature (1972);
- *Simple-Source (Rankine) Integral-Equation Formulation* for free-surface flows - original developer of method (1973);
- *Maneuvering surface-effects ships (SES) or ACV* - Cushion-chamber evolution modeling, developed for pilot-training simulator (1975);
- *Ship-to-ship interaction, Ship-to-coastline interaction* - Asymptotic hydrodynamics theory developed for such interaction in shallow water (1978-1980);
- *Transient free-surface Green function* -computations for freely floating bodies (1981);
- *Frequency-dependent behavior of hydrodynamic properties* of vertical cylinders in finite-depth water - Graphic data for offshore use (1981);
- *Free-surface flow computational methodologies review* (1982);

- *High-speed slender hulls* - developed new quasi-3D theory by using time-domain cross-plane solution to evaluate forward-speed hydrodynamic coefficients of ships (1981-84);
- *Tank-wall interference* - provided analytical explanation of cross-mode resonance and their effects on testing bodies in a tow tank (1982);
- *Shell-function method for time-dependent flows* - published an original theory on "compute-once and used for all" methodology for wave-structure interaction (1985);
- *Bow-wave oscillations* - experimental discovery of phenomena of unsteady, oscillatory bow waves in steady ship motion (1988);
- *2-D bow and stern flows* - boundary-fitted coordinates Navier-Stokes solutions to examine viscous effects (1990);
- *Frequency-domain viscous free-surface Green function* - derived and applied new Green function to examine diffusion effects of viscosity (1990);
- *Separated flow about bluff bodies* - vortex methods development (1992) with effects of surface waves modeled (1994);
- *Three-dimensional wave-structure interaction* - developed new free-surface spectral method to understand 3-D separate flows (1994-96);
- *Nonlinear floating-body motion* - developed the free-surface random vortex method (FSRVM) for modeling viscous flow with waves (1996-99);
- *Vortex-induced vibration (VIV) and viscous roll damping* - new prediction tool developed based on FSRVM (1998-2000);
- *Stratified flow hydrodynamics* - 3-D Green function for a two-layer fluid in steady motion (1998) and time-harmonic wavy motion (1999);
- *Hydroelastic interaction of floating plates with water* - Aircrafts take-off from floating runways: developed and computed hydro-elastic deformation and wave drag of moving wheels over thin plate (2000);
- *Roll hydrodynamics of cylinders with bilge keels* (1999-2002) - Examined inertia and damping properties of submerged and floating cylinders in a viscous fluid and developed modeling method for study nonlinear 3 degree-of-freedom motion;
- *Fluid dynamics of finned bodies* - plenary review of subject from VIV to FPSO (Floating-Production Storage System) (2002);
- *Shell function methodology for viscous and inviscid flows* - developed a new formulation to treat the coupling of viscous and inviscid flow in free-surface flow computations (2000-2002);
- *Multi-hull Configuration Design Optimization* - extended a classical wave-resistance theory to model multi-hull interference effects and studied complementary parametric optimization algorithms, established internet access for design code (2004-present);
- *Slender-Ship Theory with Vortical-Flow Effects* - developed an analytical framework to allow two-dimensional viscous-fluid modeling be applied to a three-dimensional hull in forward motion, enabling damping effects due to separated flows be predicted (2006-present);
- *Ocean-Wave Energy Extraction* - developed a global analysis of a point-absorber device utilizing a rectilinear electro-magnetic generator, modeling critical parameters of the system (2007-present);
- *Body-shape control for viscous damping* - conducted design and theoretical study of floating-body shapes to control viscous damping of devices so as to improve hydrodynamic and electro-mechanical performance (2009-present);
- *Permanent Magnetic Linear Generator Optimal Control* - theoretical and experimental study of energy-extraction system using nonlinear model predictive control on motion and electrical output in irregular waves for wave-energy device (2011-present);
- *Hypersingular Integral-Equation Methods* - theoretical study of hydrodynamics of thin-sheet body in waves, primarily interested in ocean-structures resonance modes (2013-present).
- *Vertical-Axis Offshore Wind Turbines* - Hybrid modeling of wind-wave loads in a slowly-yaw motion environment (2014-present).
- *Fast Multi-body Wave-Body Interaction Computations* - Analytical and Rapid procedure of modeling order of ten or more cylindrical structures in a wave-farm environment, using semi-analytical method for solution (2014-present).
- *"The Berkeley Wedge: A high-Performance Energy-Capturing Floating Breakwater"* - Development of theory and verification of a new concept of an almost 100% wave-energy capture, with no leeway

disturbance downstream of incident waves. Filed and approved as USPTO Patent #9,416,766: <http://pdfpiw.uspto.gov/.piw?Docid=09416766> (2012-2016)

- *Moon-pool Resonance with a Two-layer Fluid* – Investigate the possibility of transferring resonance motion energy to extreme moon-pool behavior (2015-present).
- *Prediction of Roll Motion Decay for Ship Hulls* – Slender-Ship formulation for computing 3-D Hulls in beam and head seas to acquire damping behavior in the presence of bilge keels (2015-present).
- *Nonlinear Model-Predictive Control for Ocean Wave Energy Extraction* – Development of hardware and software methodology for point-absorber device in theoretical and laboratory scales (2015-Present)
- *High-Performance Discrete-Vortex Computational Method Micro-Scale Flows at Lower Reynolds number.* – High performance method on desk-top scale computations to investigate micro-scale behavior of flapping wings at the edge of platform and micro-scale Bach-type Savonius Turbines (2015-Present)



Prof. Ronald W. Yeung  
(August 2011)