Paul A. Milewski
Born: October 8, 1966
Curriculum Vitæ

Department of Mathematics
University of Wisconsin–Madison
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Research Interests

Analytical and numerical studies of wave propagation, fluid dynamics and geophysical flows.
Mathematical modeling in Biology.

Education

Massachusetts Institute of Technology **Cambridge, Massachusetts.**
Ph.D. in Applied Mathematics, August 1993. Advisor: David Benney.

Boston University **Boston, Massachusetts.**
Master of Science in Aerospace Engineering, 1989.

Bachelor of Science in Aerospace Engineering, Summa cum Laude, 1988.

Professional Experience

École Normale Supérieure, **Cachan, France.**
2008–2009 Professeur Invité.

University of Wisconsin, Department of Mathematics **Madison, Wisconsin.**
2003–present Professor.
1999–2003 Associate Professor.
1995–1999 Assistant Professor.

University of Victoria, Department of Mathematics, **Victoria, BC, Canada.**
2001–2002 Visiting Professor.

Stanford University, Department of Mathematics **Stanford, California.**
1993–1995 Gabor Szegö Assistant Professor.

Woods Hole Oceanographic Institute **Woods Hole, Massachusetts.**
Summer 1991 Research Fellow in Geophysical Fluid Dynamics.

Academic Honors

Vilas Associate. 2007-08.

Alfred P. Sloan Research Fellow. 1997.

Lilly Teaching Fellow. 1997.

Stanford University *Harold M. Bacon Mathematics Teaching Award.* 1994.

Academic Activities

Director of *Applied Mathematics, Engineering and Physics (AMEP)* undergraduate degree program. (1997–)

Faculty member of *BACTER Institute* in computational biology. (2004–)

Principal Investigator and Coordinator of *VIGRE* program. (2004–)

Leader of CRG on Complex Geophysical Fluid Dynamics. UBC and PIMS. (2008)

Junior Staff Supervisor, Department of Mathematics, UW-Madison. (2004–2008)

Editorial Responsibilities and Conference Organization

Conference Organizer and Editor of Proceedings.	AMS-IMS-SIAM Conference, Mt. Holyoke, USA 2000
Conference Organizer.	Waves in the Atmosphere and Ocean, SFU, Canada 2008
Conference Organizer.	Waves in Fluids II, Paraty, Brazil 2008
Associate Editor.	Communications in Mathematical Sciences
Associate Editor.	Journal of Computational and Applied Mathematics

Selected Recent Invitations

Frontiers in Applied and Computational Mathematics, NJIT. May 06
Waves in Fluids Workshop, Instituto de Fisica Teorica, São Paulo, Brazil. June 2006
Chinese University of Hong Kong Applied Mathematics Colloquium. June 2006
Oberwolfach, Workshop on Atmosphere–Ocean Modelling. August 2006 (also 2002)
University of Michigan Applied Mathematics Colloquium. September 2006
University of North Carolina Applied Mathematics Colloquium. October 2006
Oberwolfach, Workshop on Mathematical Theory of Water Waves. November 2006
Simon Fraser University, Vancouver, Canada. Applied Mathematics Colloquium, November 2006
University of Victoria, Victoria, Canada. Applied Mathematics Colloquium, November 2006 (also 2001)
SANUM Annual Meeting - Plenary Speaker, University of Stellenbosch, South Africa. April 2007 (also 2006).
Colloquia - Peking University and Tsinghua University, Beijing, China. May 2007.
ICIAM07 - Zurich, Switzerland. July 2007.
Instituto de Matemática Pura e Aplicada (IMPA), PDE Workshop. August 2007 (also 2005, 2003, 2001)
Biophysics Workshop, Buzios, Brazil. August 2007.
Colloquium and Scientific Computing Seminar, University of British Columbia, February 2008.
Second Canada-France Congress, Montreal, Canada, June 2008
Nonlinear Waves: Theory and Applications, Beijing, China, June 2008
SIAM Nonlinear Waves and Coherent Structures, Rome, Italy, July 2008 (also 2006, 2002)
Workshop on Stability of Mechanical Systems, Barcelona, Spain, December 2008.
Séminaire CMLA, École Normale Supérieure de Cachan, France, December 2008
Invited Course "Introduction to Geophysical Waves", IMPA, Rio de Janeiro, Brazil, February 2009
Invited Course "Waves in Fluids", AIMS, Muizenberg, South Africa, March 2009

Publications

[1] Milewski, P. A.(1991) Ray theory of water waves on a current. *Woods Hole Oceanog. Inst. Tech. Rept., WHOI 92-16*, pp. 214–222.

[2] Milewski, P. A.(1992) Oscillating tails in the perturbed Korteweg–de Vries equation. *Stud. Appl. Math.*, **90**, pp. 87–90.

[3] Milewski, P. A., Benney, D. J. (1995) Resonant interactions between vortical flows and water waves. Part I. Deep water. *Stud. Appl. Math.*, **94**, pp. 131–167.

[4] Milewski, P. A. (1995) Resonant interactions between vortical flows and water waves. Part II. Shallow water. *Stud. Appl. Math.*, **94**, pp. 225–256.

[5] Milewski, P. A., Keller J. B. (1996) Three dimensional water waves. *Stud. Appl. Math.*, **37**, pp. 149–166.

[6] Milewski, P. A. (1998) A formulation for water waves over topography.
Stud. Appl. Math., **100**, pp. 95–106.

[7] Milewski, P. A., Vanden–Broeck, J.–M., Keller, J. B. (1998) Singularities on free surface flows.
Stud. Appl. Math., **100**, pp. 245–267

[8] Milewski, P. A. (1998) Long wave interaction over variable topography. *Physica D*, **123**, pp. 36–47.

[9] Milewski, P. A., Vanden–Broeck, J.–M. (1999) Time dependent gravity–capillary flows past an obstacle.
Wave Motion, **29**, pp. 63–79.

[10] Kuske R., Milewski, P. A. (1999) Modulated two–dimensional patterns in reaction–diffusion systems.
European. Jour. Appl. Math., **10**,pp. 157–184.

[11] Milewski, P. A., Tabak, E. G. (1999) A pseudo–spectral procedure for the solution of nonlinear wave equations with examples from free–surface flows. *SIAM J. Sci. Comp.*, **21**, pp. 1102–1114.

[12] Milewski, P. A., Tabak, E. G. (1999) A reduced model for nonlinear dispersive waves in a rotating environment. *Geoph. and Astroph. Fluid Mech.*, **90**, pp.139–159.

[13] Keller, J. B., Milewski, P. A., Vanden–Broeck J.–M. (2000) Wetting and merging driven by surface tension. *Eur. Jour. Mech. B. Fluids*, **19**, pp. 451–502.

[14] Berger, K., Milewski, P. A. (2000) The generation and evolution of lump solitary waves in surface-tension-dominated flows. *SIAM J. Appl. Math.*, **61**, pp. 731–750

[15] Milewski, P. A., Smith, L., Tabak, E. G., Waleffe, F. (Editors) Advances in Wave Interaction and Turbulence. *Contemporary Mathematics vol. 283*, American Mathematics Society. 2001.

[16] Milewski, P. A., Tabak, E. G., Vanden Eijnden, E. (2002) Resonant wave interaction with random forcing and dissipation, *Stud. Appl. Math.*, **108**, pp. 123–144.

[17] Berger, K., Milewski, P. A., Simulation of wave interactions and turbulence in one-dimensional water waves. (2003) *SIAM J. Appl. Math.*, **63**, 4, pp. 1121-1140.

[18] Milewski, P. A., Vanden–Broeck J.–M., Keller, J. B. (2002), Breaking and merging of liquid sheets and filaments. *J. Eng. Math.*, **42(3)**, pp. 283-290;

[19] Choi, J., Milewski, P. A. (2003) Long nonlinear waves in resonance with topography.
Stud. in Appl. Math. **110**, pp. 21–48.

[20] Milewski, P. A., (2004) The forced Korteweg–de Vries equation as a model for waves generated by topography. *CUBO* **6**, 4, pp. 33-51.

[21] Milewski, P. A., Tabak, E. G., Turner, C., Rosales, R. R., Menzaque, F. (2004) Nonlinear Stability of Two-Layer Flows *Comm. Math. Sci.* **2**, 3, pp. 427–442.

[22] Milewski, P. A. (2005) Three-dimensional localized solitary gravity-capillary waves.
Comm. Math. Sci. **3**, 1, pp. 89–99.

[23] Ziebarth, N., Heideman, P., Shapiro, R., Stoddart, S., Hsiao, C., Stephenson, G., Milewski, P. A., Ives, A. (2005) Evolution of periodicity in periodical cicadas *Ecology*, **86(12)**, pp. 3200-3211.

[24] DeVille, R. E. L., Milewski, P. A., Pignol, R., Tabak, E., Vanden-Eijnden, E. (2006)

Non-equilibrium statistics of a reduced model for energy transfer in waves. *Comm. on Pure and Applied Math.*, **59**, pp. 1–23.

[25] Jacobsen, T., Milewski, P. A., Tabak, E. (2008) Mixing closures for conservation laws in stratified flows. *Stud. in Appl. Math.* **121**, pp. 89–116.

[26] Raupp, M., Silva Dias, P., Tabak, E., Milewski, P. A. (2008) Nonlinear wave interactions and their potential role on tropics-extratropics connection. To Appear. *J. Atmos. Sci.*

[27] Chumakova, L., Menzaque, F., Milewski, P. A., Rosales, R. R., Tabak, E. G., Turner C. (2007) Stability properties and nonlinear mappings of two- and three-layer stratified flows. To appear *Stud. in Appl. Math.*

[28] Chumakova, L., Menzaque, F., Milewski, P. A., Rosales, R. R., Tabak, E. G., Turner C. (2007) Shear instability for stratified hydrostatic flows. To appear. *Comm. on Pure and Applied Math.*

[29] Milewski, P. A., Yang, X. (2008) A simple model for biological aggregation with asymmetric sensing. *Comm. Math. Sci.*. **6**, pp. 397-416.

[30] Akers, B., Milewski, P. A. (2008) Model equations for gravity-capillary waves in deep water. *Stud. in Appl. Math.* **121**, pp. 49–69.

[31] Akers, B., Milewski, P. A. (2008) A stability result for solitary waves in nonlinear dispersive equations. *Comm. Math. Sci.*. **6**, pp. 791-797.

[32] Akers, B., Milewski, P. A. (2008) A model equation for wavepacket solitary waves arising from capillary-gravity flows. To appear *Stud. in Appl. Math.*

[33] Akers, B., Milewski, P. A. (2008) Dynamics of three dimensional gravity-capillary solitary waves in deep water. *Preprint.*

[34] Simons, J., Milewski, P. A. (2008) *R. sphaeroides* and *E. coli*: a Mathematical Model of Chemotactic Response to l-aspartate. *Preprint.*

Grants

National Science Foundation DMS 9401405 (PI-Joseph Keller) (1994–1997)
National Science Foundation DMS 9704606, (1997–2000)
National Science Foundation DMS 0071939, (2000–2003)
NIGMS GM67244-01 (Modelling Biological Processes), (2001–2007)
National Science Foundation DMS 0306444, (2003–2006)
National Science Foundation DMS 0337500 (Undergraduate Research in Mathematical Biology), (2004–2006)
National Science Foundation VIGRE 0354112 (Mathematics Department Infrastructure Grant), (2004–2009)
National Science Foundation DMS 0604635, (2006–2009)

Graduate Students and Postdoctoral Fellows

Kurt Berger (PhD, August 2000). Oblon, Spivak, McLellend, Maier, & Neustadt, Alexandria, Va.
Jongho Choi (PhD, August 2001). Aquila Enargy, Kansas City, Ms.
Christopher Raymond (VIGRE Postdoctoral Fellow, 1999-2002). Assistant Professor, NJIT.
Benjamin Akers (August 2008) Department of Mathematics, UIC
Julie Simons current student.
Daniela Banu current student.

Recent Collaborators

David Ambrose (Clemson)
Pedro Silva Dias (USP, Brazil)
David Edwards (Delaware)
Anthony Ives (Madison)
Joseph Keller (Stanford University)
Rachel Kuske (University of British Columbia)
Ruben Rosales (Massachusetts Institute of Technology)
Esteban Tabak (Courant Institute)
Jean-Marc Vanden-Broeck (University College, London)
Eric Vanden-Eijnden (Courant Institute)