CURRICULUM VITAE: JON WILKENING

1051 Evans Hall — Tel. 510.643.7990
Department of Mathematics — Fax. 510.642.8204
University of California, Berkeley — wilken@math.berkeley.edu
Berkeley, CA 94720-3840 — http://math.berkeley.edu/~wilken

EDUCATION

University of California, Berkeley — Berkeley, 2002
Ph. D. in Mathematics
Advisor: Prof. James Sethian
Dissertation: *Mathematical Analysis and Numerical Simulation of Electromigration*

University of Arizona — Tucson, 1996
B.S. in Engineering Physics, Summa Cum Laude with Honors

FELLOWSHIPS AND AWARDS

National Science Foundation Faculty Early Career Development Award (CAREER)	2010-2015
Frederick A. Howes Scholar in Computational Science	2003
Department of Energy Computational Science Graduate Fellowship	1997–2001
National Science Foundation Graduate Research Fellowship	(declined in favor of CSGF, 1997)
Flinn Foundation Scholarship	1992–1996

APPOINTMENTS

University of California, Berkeley, *Professor*	2016–present
University of California, Berkeley, *Associate Professor*	2011–2016
Courant Institute of Mathematical Sciences, *Visiting Professor*	2013–2014
University of California, Berkeley, *Assistant Professor*	2005–2011
Courant Institute of Mathematical Sciences, *Courant Instructor, Research Postdoc*	2002–2005
Lawrence Berkeley National Laboratory, *Research Assistant*	1997–2002
Los Alamos National Laboratory, *Research Assistant*	Summer, 1999
University of California, Berkeley, *Graduate Student Instructor*	1996, 2001
University of Arizona, *Teaching Assistant*	1996
Arizona Research Laboratories, Surface Sciences Division, *Research Assistant*	1994

RESEARCH INTERESTS

Broadly:
Numerical Analysis, Computational Physics, Partial Differential Equations, High Performance Computing

Specifically:
Nonlinear waves, vortex sheets, water waves, mode-locked lasers, solitons, quasi-periodic solutions
Orthogonal polynomials, singular Sturm-Liouville theory, spectral methods, Kimura diffusion
Plasma oscillations, Landau damping, Volterra equations, exponential time differencing schemes
Boundary value problems, adjoint methods, shape optimization, PDE-constrained optimization
Dirichlet to Neumann operators in solid and fluid mechanics, semigroup theory, grain-boundary diffusion
Numerical optimization, optimal transportation, high order time-stepping, spectral deferred correction
Least squares finite elements, singular basis functions, interface problems in elasticity
Perturbation methods, lubrication theory, stable representations of corner singularities
Numerical linear algebra, multigrid, canonical forms of matrices, Jordan chains
Generalized Gaussian quadrature rules, free space Poisson problems, micromagnetics

PUBLICATIONS

D. Ambrose, R. Camassa, J.L. Marzuola, R.M. McLaughlin, Q. Robinson and J. Wilkening, Numerical algoriths for water waves with background flow over obstacles and topography, (2021) *preprint: arXiv:2108.01786*

J. Wilkening, Traveling-standing water waves, *Fluids*, 6 (2021) 187:1–35.

J. Wilkening and X. Zhao, Spatially quasi-periodic water waves of infinite depth, *J. Nonlinear Sci.*, 31 (2021) 52:1–43.

J. Wilkening and X. Zhao, Quasi-periodic travelling gravity-capillary waves, *J. Fluid Mech.*, 915 (2021) A7:1–35.

F. A. Grunbaum, L. Velazquez and J. Wilkening, Occupation time for classical and quantum walks, *From Operator Theory to Orthogonal Polynomials, Combinatorics and Number Theory*, Editors: Fritz Gesztesy and Andrei Martinez-Finkelshtein. Birkhauser (2021).

J. Wilkening, Harmonic stability of standing water waves, *Quarterly of Appl. Math.*, 78/2 (2020) 219–260.

C. L. Epstein and J. Wilkening, Some analytic results for Kimura diffusion operators, *Acta Math Vietnam*, 45 (2020). 171–181.

C. H. Aurther, R. Granero-Belinchón, S. Shkoller and J. Wilkening, Rigorous asymptotic models of water waves, *Water Waves*, 1/1 (2019) 71–130.

S. Qadeer and J. Wilkening, Computing the Dirichlet–Neumann operator on a cylinder, *SIAM J. Numer. Anal.*, 57/3 (2019) 1183–1204.

E. Kim and J. Wilkening, Convergence of a mass-lumped finite element method for the Landau-Lifshitz equation, *Quarterly of Appl. Math.*, 76/2 (2018) 383–405.

C. L. Epstein and J. Wilkening, Eigenfunctions and the Dirichlet problem for the Classical Kimura Diffusion Operator, *SIAM J. Appl. Math*, 77/1, (2017) 51–81.

M. J. Zahr, P.-O. Persson and J. Wilkening, A fully discrete adjoint method for optimization of flow problems on deforming domains with time-periodicity constraints, *Computers and Fluids*, 139 (2016) 130–147.

O. Trichtchenko, B. Deconinck and J. Wilkening, The instability of Wilton ripples, *Wave Motion*, 66 (2016) 147-155.

A. Lieb, C. H. Rycroft and J. Wilkening, Optimizing intermittent water supply in urban pipe distribution networks, *SIAM J. Appl. Math.*, 76/4 (2016) 1492–1514.

J. Wilkening, A. Cerfon and M. Landreman, Accurate spectral numerical schemes for kinetic equations with energy diffusion, *J. Comput. Phys.*, 294 (2015), 58–77.

J. Wilkening and A. Cerfon, A spectral transform method for singular Sturm-Liouville problems with applications to energy diffusion in plasma physics, *SIAM J. Appl. Math.*, 75/2 (2015), 350–392.

J. Birrell, J. Wilkening and J. Rafelski, Boltzmann equation solver adapted to emergent chemical non-equilibrium, J. Comput. Phys., 281 (2015) 896–916.

X. Tu, M. Morzfeld, J. Wilkening and A. Chorin, Parameter estimation by implicit sampling, *Comm. App. Math. and Comp. Sci.*, 10/2 (2015), 205–225. DOI 10.2140/camcos.2015.10.205.

J. Wilkening and V. Vasan, Comparison of five methods of computing the Dirichlet-Neumann operator for the water wave problem, *Contemp. Math.*, 635 (2015), 175–210.

J. Wilkening, Relative-periodic elastic collisions of water waves, *Contemp. Math.*, 635 (2015) 109–129.

S. Govindjee, T. Potter and J. Wilkening, Dynamic stability of spinning viscoelastic cylinders at finite deformation, *Int. J. Solids Struct.*, 51 (2014) 3589–3603.

S. Govindjee, T. Potter and J. Wilkening, Cyclic steady states of treaded rolling bodies, *Int. J. Numer. Meth. Engng.*, 99 (2014), 203–220.

D. M. Ambrose and J. Wilkening, Dependence of time-periodic vortex sheets with surface tension on mean vortex sheet strength, Procedia IUTAM 11 (2014), 15–22.

PUBLICATIONS (CONTINUED)

J. Bourgain, F. A. Grunbaum, L. Velazquez and J. Wilkening, Quantum recurrence of a subspace and operator-valued Schur functions, *Comm. Math. Phys.*, 329 (2014), 1031–1067.

C. H. Rycroft and J. Wilkening, Computation of three-dimensional standing water waves, *J. Comput. Phys.*, 255 (2013), 612–638.

J. Wilkening and J. Yu, Overdetermined shooting methods for computing standing water waves with spectral accuracy, *Comput. Sci. Disc.*, 5 (2012), 014017.

M. O. Williams, E. Shlizerman, J. Wilkening and J. N. Kutz, The low dimensionality of time-periodic standing waves in water of finite and infinite depth, *SIAM J. Appl. Dyn. Syst.*, 11/3 (2012), 1033–1061.

D. M. Ambrose and J. Wilkening. Computation of time-periodic solutions of nonlinear systems of partial differential equations. Proceedings of Hyperbolic Problems: Theory, Numerics, and Applications. Beijing, China, 2010. Higher Education Press, pp. 273–280, (2012).

J. Wilkening, Breakdown of self-similarity at the crests of large amplitude standing water waves, *Phys. Rev. Lett.*, 107 (2011), 184501.

M. O. Williams, J. Wilkening, E. Shlizerman and J. N. Kutz, Continuation of periodic solutions in the waveguide array mode-locked laser, *Physica D*, 240/22 (2011), pp. 1791–1804.

L. C. Lee, S. J. S. Morris and J. Wilkening, Stress concentrations, diffusionally-accommodated grain boundary sliding and the viscoelasticity of polycrystals, *Proc. Royal Soc. A*, 467 (2011), pp. 1624–1644.

Jon Wilkening and Jia Yu, A local construction of the Smith normal form of a matrix polynomial, *J. Symbolic Comput.*, 46 (2011), pp. 1–22.

D. M. Ambrose and J. Wilkening, Computation of symmetric, time-periodic solutions of the vortex sheet with surface tension, *Proc. Natl. Acad. Sci.*, 107/8 (2010), pp. 3361-3366.

L. C. Lee, S. J. S. Morris, J. Wilkening and T. I. Zohdi, Effects of stress concentrations on the attenuation by diffusionally assisted grain boundary sliding, Proceedings of 16th US National Congress of Theoretical and Applied Mechanics, 2010, State College, PA.

Michael Westdickenberg and Jon Wilkening, Variational particle scheme for the porous medium equation and for the system of isentropic Euler equations, *ESAIM-Math. Model. Num.*, 44 (2010), pp. 133–166.

J. Wilkening, An infinite branching hierarchy of time-periodic solutions of the Benjamin-Ono equation, arXiv:0811.4209.

D. M. Ambrose and J. Wilkening, Computation of time-periodic solutions of the Benjamin-Ono equation, *J. Nonlinear Sci.*, 20/3 (2010), pp. 277–308.

D. M. Ambrose and J. Wilkening, Global paths of time-periodic solutions of the Benjamin-Ono equation connecting pairs of traveling waves, *Comm. Appl. Math. Comput. Sci.*, 4/1 (2009), pp. 177–215.

J. Wilkening, Practical error estimates for Reynolds' lubrication approximation and its higher order corrections, *SIAM J. Math. Anal.*, 41/2 (2009), pp. 588–630.

J. Wilkening, A. E. Hosoi, Shape optimization of a sheet swimming over a thin liquid layer, *J. Fluid Mech.*, 601 (2008), pp. 25–61.

J. Wilkening, Inf-sup estimates for the Stokes problem in a periodic channel, arXiv:0706.4082.

J. Wilkening, *Math 228A,B Lecture Notes. Numerical Solution of Differential Equations*, (2007, 2011).
http://math.berkeley.edu/~wilken/228A.F07/wilkening_228A_notes.pdf
http://math.berkeley.edu/~wilken/228B.S07/wilkening_228B_notes.pdf
http://math.berkeley.edu/~wilken/wilkening_228B_additional_lectures.pdf

J. Wilkening, An algorithm for computing Jordan chains and inverting analytic matrix functions, *Lin. Alg. Appl.*, 427 (2007), pp. 6–25.

PUBLICATIONS (CONTINUED)

J. Wilkening, L. Borucki, J. A. Sethian, Analysis of stress-driven grain boundary diffusion. Part I, *SIAM J. Appl. Math.* 64/6 (2004), pp. 1839–1863.

J. Wilkening, L. Borucki, J. A. Sethian, Analysis of stress-driven grain boundary diffusion. Part II: degeneracy, *SIAM J. Appl. Math.* 64/6 (2004), pp. 1864–1886.

J. A. Sethian, J. Wilkening, A numerical model of stress driven grain boundary diffusion, *J. Comput. Phys.*, 193/1 (2004), pp. 275–305.

J. Wilkening, Mathematical Analysis and Numerical Simulation of Electromigration, PhD thesis, University of California, Berkeley, May 2002.

INVITED TALKS

Quasi-periodic water waves
- SIAM Annual Meeting (*Minisymposium: Nonlinear Waves*) (Virtual talk) 7/2021
- Missouri University / Missouri Science and Technology (*Joint Analysis Seminar*) (Virtual talk) 3/2021
- Simons Collaboration on Wave Turbulence (NYU/Princeton) (*Wave Turbulence Seminar*) (Virtual talk) 6/2020
- BIRS (*Workshop: Dynamics in Geometric Dispersive Equations*) Banff, Canada, 2/2020

A numerical study of quasi-periodic water waves
- MSRI (*Workshop: Mathematical Problems in Fluid Dynamics*) (part 1, 60-min virtual talk) 2/2021
- MSRI (*Workshop: Mathematical Problems in Fluid Dynamics*) (part 2, 60-min virtual talk) 2/2021
- Joint Mathematics Meeting (*Session: New Frontiers in Computational Mathematics*) (Virtual talk) 1/2021

Computing temporally quasi-periodic water waves
- SISSA/Berkeley working group (*Seminar: Quasi-Periodic Waves*) (Virtual talk) 5/27/2020

Spatially quasi-periodic water waves
- Zakharov Scientific School, Skoltech Russia (Virtual talk) 10/2020
- Fields Institute (*Workshop on Free Surface Hydrodynamics*) (Virtual talk) 10/2020
- SISSA/Berkeley working group (*Seminar: Quasi-Periodic Waves*) (Virtual talk) 5/5/2020

Complex Variable Methods for Water Waves
- San Diego State University (*Applied Math Colloquium*) San Diego, CA, 9/2019

Water waves over multiply-connected domains
- ICIAM 2019 (*Nonlinear Waves, Singularities and Turbulence*) Valencia, Spain, 7/2019

Volterra Integral Equation Method for Linearized Electron Plasma Wave Dynamics Including Temporal Echoes
- 61st Annual Meeting of the APS Division of Plasma Physics (poster presentation) Fort Lauderdale, FL, 11/2019

Spectrally Accurate Methods for Kinetic Electron Plasma Wave Dynamics
- University of Maryland Numerical Analysis Seminar College Park, MD, 10/2019
- SIAM Conference on Dynamical Systems Snowbird, UT, 5/2019
- IMACS Conference on Nonlinear Waves Athens, GA, 4/2019
- 60th Annual Meeting of the APS Division of Plasma Physics (poster presentation) Portland, OR, 11/2018

Traveling-standing water waves
- Berkeley/Stanford SIAM Student Chapter Seminar Berkeley, CA, 11/2018

Computing quasi-periodic water waves
- SIAM Conference on Nonlinear Waves and Coherent Structures Anaheim, CA, 6/2018

Water waves over multiply-connected domains
- Recent Advances in Nonlinear Waves Seattle, 8/2017

Spectral exponential time differencing schemes and singular Sturm-Liouville operators
- (plenary talk) Modern Advances in Computational and Applied Mathematics New Haven, 6/2017

INVITED TALKS (CONTINUED)

Traveling-standing water waves and their stability
UC Davis Applied Math/PDE Seminar — Davis, CA, 11/2017
Air Force Institute of Technology, ENC Seminar — Dayton, OH, 6/2017
ICERM Semester Program on Singularities and Waves In Incompressible Fluids — Providence, 3/2017

Subharmonic stability and quasi-periodic perturbations of traveling and standing water waves
SIAM Conference on Nonlinear Waves and Coherent Structures — Philadelphia, 8/2016

Symmetric Pseudo-Spectral Velocity Discretization Schemes for Kinetic Equations with Energy Diffusion
30th International Symposium on Rarefied Gas Dynamics — Victoria, BC, 7/2016

Stability and quasi-periodic perturbations of traveling and standing water waves
Stanford Applied Math Seminar — Palo Alto, 2/2016

Extreme standing water waves, stability, and quasi-periodicity
University of New Mexico Applied Mathematics Colloquium — Albuquerque, 2/2016

Subharmonic stability of traveling-standing water waves
AMS/MAA Joint Math Meetings — Seattle, 1/2016

Quasi-periodic water wave dynamics
Brown University, Dynamical Systems/Scientific Computing Seminar — Providence, RI, 9/2015
American Physical Society Division of Fluid Dynamics 67rd Annual Meeting — San Francisco, 11/2014

Nearly time-periodic water waves
Newton Institute Programme on the Theory of Water Waves — Cambridge, UK, 7/2014
Dynamics in Geometric Dispersive Equations — Banff, 5/2014
University of Maryland Numerical Analysis Seminar — College Park, MD, 4/2014
University of Wisconsin Applied and Computational Math Seminar — Madison, WI, 4/2014
Institute for Advanced Study, Nonequilibrium Dynamics and Random Matrices Seminar — Princeton, NJ, 2/2014
University of Minnesota PDE Seminar — Minneapolis, 10/2013

Traveling-Standing Water Waves: Stability, Singularity Formation, and Microseisms
Cornell Scientific Computing and Numerics Seminar — Ithaca, NY, 3/2014
University of Texas, ICES Applied Mathematics Seminar — Austin, TX, 1/2014

Spectral Analysis of Continuum Kinetic Velocity Diffusion Equations
Courant Institute Applied Mathematics Seminar — New York, 11/2013
University of Arizona Applied Mathematics Colloquium — Tucson, 11/2013

Traveling-Standing Water Waves and Microseisms
Duke Applied Math and Analysis Seminar — Durham, NC, 11/2013
UNC Applied Math Seminar — Chapel Hill, NC, 11/2013
NJIT Applied Mathematics Colloquium — Newark, NJ, 10/2013
MIT Physical Mathematics/Numerical PDE Seminar — Cambridga, MA, 10/2013
Water Waves: Computational Approaches for Complex Problems — Banff, Canada, 7/2013
IMACS Conference on Nonlinear Waves — Athens, GA, 4/2013

Nearly time-periodic water waves
AMS Western Sectional Meeting (*Session: Nonlinear Waves and Integrable Systems*) — Boulder, CO, 4/2013
Courant Institute Mathematics Colloquium — New York, 3/2013

Stability of Interacting Solitary Water Waves, Standing Waves and Breathers
SIAM Conference on Computational Science and Engineering — Boston, 2/2013

Quasi-periodic perturbations of time-periodic water waves
SIAM Conference on Application of Dynamical Systems — Snowbird, UT, 5/2013
Workshop on Mathematical Modeling and Analysis of Extreme Sea Waves — Les Treilles, France, 10/2012

INVITED TALKS (CONTINUED)

Dynamics and stability of time-periodic water waves
University of Washington, Special Topics in Applied Mathematics Seminar — Seattle, 4/2012

Elastic solitary water wave interactions
AMS Western Sectional Meeting (session on nearly integrable systems) — Honolulu, 3/2012

Breakdown of self-similarity at the crests of large amplitude standing water waves
SIAM Conference on Nonlinear Waves and Coherent Structures — Seattle, 6/2012
British Applied Mathematics Colloquium, University College — London, 3/2012
University of Bath, Center for Nonlinear Mechanics Seminar — Bath, UK, 3/2012
UC Santa Cruz Math Colloquium — Santa Cruz, 11/2011
University of Arizona Applied Math Colloquium — Tucson, 10/2011
DOE Applied Mathematics Program Meeting — Washington DC, 10/2011

Bifurcation and resonance in standing water waves
SIAM Conference on Analysis of Partial Differential Equations — San Diego, 11/2011
ICIAM 2011 (session on boundary integral methods) — Vancouver, 7/2011
Waves in Fluids III, IMPA, Brazil — Rio de Janeiro, 6/2011

Computation of time-periodic water waves
IMACS Conference on Nonlinear Waves — Athens, GA, 4/2011
AMS Western Sectional Meeting (session on nonlinear phenomena) — Los Angeles, 10/2010
SIAM Conference on Nonlinear Waves and Coherent Structures — Philadelphia, 8/2010

Computation of two-dimensional standing water waves
American Physical Society Division of Fluid Dynamics 63rd Annual Meeting — Long Beach, 11/2010

Computation of time-periodic solutions of fluid interface problems
University of Illinois, Chicago, Math and its Applications Seminar — Chicago, 9/2010
University of Waterloo Applied Math Colloquium — Canada, 7/2010
Mechanical Engineering Fluid Mechanics Seminar — Berkeley, 4/2010
SIAM Conference on Parallel Processing — Seattle, 2/2010
University of Washington Applied Math Seminar — Seattle, 2/2010
Courant Institute Applied Math Seminar — New York, 2/2010
Harvard Widely Applied Math Seminar — Boston, 2/2010
University of Michigan Applied Math Colloquium — Ann Arbor, 12/2009
Lawrence Berkeley Lab Site Visit — Berkeley, 8/2009

Time-periodic solutions of the vortex sheet with surface tension
American Physical Society Division of Fluid Dynamics 62nd Annual Meeting — Minneapolis, 11/2009
AMS Eastern Sectional Meeting (session on nonlinear waves) — College Park, PA, 10/2009

Topics in Solid and Fluid Mechanics
Mechanical Engineering Colloquium — Berkeley, 9/2009

Computation of time-periodic solutions of nonlinear PDE
Drexel University Applied Math/PDE Seminar — Philadelphia, PA, 10/2009
Carnegie Mellon University Applied Math Seminar — Pittsburgh, 9/2009
UC Santa Cruz Applied Math Seminar — Santa Cruz, 10/2009
SIAM Annual Meeting — Denver, CO, 7/8/2009
Northwestern Applied Math Colloquium — Evanston, IL, 6/1/2009
UC Davis Math Colloquium — Davis, CA, 4/13/2009

INVITED TALKS (CONTINUED)

Time-periodic solutions of the Benjamin-Ono equation

CU Boulder Nonlinear Waves Seminar	Boulder, CO, 1/27/2009
Indiana University PDE/Applied Math Seminar	Bloomington, 10/27/2008
AMR08 (DOE Applied Mathematics Principal Investigators Meeting)	Argonne, IL, 10/15/2008
UC Berkeley Applied Math Seminar	Berkeley, 9/12/2008
Georgia Tech Applied Math Seminar	Atlanta, 3/24/2008

Lubrication Theory in Nearly Singular Geometries: When Should One Stop Optimizing a Reduced Model?

IMA Program on Geometrical Singularities and Singular Geometries	Minneapolis, 7/24/2008

Rigorous Error Estimates for Reynolds' Lubrication Approximation

American Physical Society Division of Fluid Dynamics 59th Annual Meeting	Tampa, 11/2006

Shape Optimization of Swimming Sheets

SAMSI interface problems workshop	North Carolina, 11/15/2007
Cal Day	Berkeley, 4/21/2007
UC Berkeley Scientific Computing Seminar	Berkeley, 4/11/2007
Georgia Tech Applied Math Seminar	Atlanta, 4/5/2007
SIAM Conference on Computational Science and Engineering	Costa Mesa, 2/21/2007
U.C. Davis Applied Math Seminar	Davis, 5/26/2006
Dartmouth Math Colloquium	Hannover, 5/11/2006
Courant Institute Applied Math Lab Seminar (NYU)	New York, 3/30/2006
U.C. Merced Math Colloquium	Merced, 3/20/2006
Cornell CAM Colloquium	Ithaca, 2/24/2006
CPAM lunchtime seminar	Berkeley, 2/2/2006
American Physical Society Division of Fluid Dynamics 58th Annual Meeting	Chicago, 11/2005

Mathematics of Microchip Failure

SAC Capital Advisors, LLC	New York, 9/2004

Grain Boundary Diffusion due to Stress and Electromigration

Columbia University Applied Math Colloquium	New York, 4/2005
Brown University Applied Math Seminar	Providence, 4/2005
University of Maryland Applied Math Seminar	College Park, 4/2005
MIT Applied Math Seminar	Boston, 3/2005
UCLA Applied Math Seminar	Los Angeles, 3/2005
UC Berkeley Applied Math Seminar	Berkeley, 3/2005
University of Arizona Applied Math Seminar	Tucson, 3/2005
Cornell University CAM Colloquium	Ithaca, 3/2005
Georgia Tech Applied Math Seminar	Atlanta, 3/2005
University of Minnesota	Minneapolis, 2/2005
Simon Fraser Applied Math Seminar	Canada, 2/2005
CU Boulder Applied Math Colloquium	Boulder, 2/2005
Rutgers Applied Math Seminar	New Brunswick, 2/2005
Courant Institute Applied Math Seminar	New York, 2/2005
UC Berkeley Math Colloquium	Berkeley, 10/2004
CSGF Conference (Howes Scholar Talk)	Washington D.C., 7/2004
SIAM Conference on Mathematical Aspects of Materials Science	Los Angeles, 5/2004
Cornell CAM Colloquium	Ithaca, 2/2004
Fields Institute, Workshop on Patterns in Physics	Toronto, 11/2003
Rutgers Mathematical Physics Seminar	New Brunswick, 10/2003
5th International Congress on Industrial and Applied Mathematics	Sydney, AUS, 7/2003
IBM T. J. Watson Research Center	Yorktown, NY, 5/2003

INVITED TALKS (CONTINUED)

Constructing Stable Asymptotics for Corner Singularities of Elliptic Systems
Fourth World Congress of Nonlinear Analysts — Orlando, 7/2004
CIMS Analysis Seminar (NYU) — New York, 4/2004

A Simulation of Mass Transport Phenomena in Aluminum Interconnect Lines
Bay Area Scientific Computing Day — Livermore, CA, 2/10/2001

Void Growth, Level Sets, and Multigrid
Center for Nonlinear Studies, LANL — Los Alamos, 7/1999

POSTDOCS

Marcus Roper (Miller Fellow) — 2008–2011

Chris H. Rycroft (Lawrence Berkeley National Laboratory) — 2007–2010

PH. D. STUDENTS

Ahmad-Zaid Abassi — 2021–present

Rockford Sison — 2015–present

Xinyu Zhao — 2017–2021
Ph. D. Thesis: *Spatially Quasi-Periodic Gravity-Capillary Waves*

Yanhe Huang, — 2017–2020
Ph. D. Thesis: *A Boundary Integral Method for Modeling Axisymmetric Flow Around a Rising Bubble in a Vertical Tube and Accurate Numerical Evaluation of Orthogonal Polynomials*

Alexander Appleton — 2015–2019
Ph. D. Thesis: *Singularities in U(2)-invariant 4d Ricci flow*

Kazuki Koga (visitor from Kyoto University; I was his mentor at ICERM in Spring 2017) — Fall 2018

Saad Qadeer — 2015–2018
Ph. D. Thesis: *Simulating Nonlinear Faraday Waves on a Cylinder*

Eugenia Kim — 2013–2017
Ph. D. Thesis: *Numerical methods for the Landau-Lifshitz equation in micromagnetics: the mimetic finite difference method and the mass-lumped finite element method*

Tomoaki Hirakawa (visitor from Kyushu University) — Summer 2016

Anna Lieb — 2012–2016
Ph. D. Thesis: *Modeling and optimization of transients in water distribution networks with intermittent supply*

Daneil Greengard — 2009–2016
Ph. D. Thesis: *Complex Boundary Integral Equation Formulation and Stability Analysis of a Maxwell Model and of an Elastic Model of Solid-Solid Phase Transformations*

Trevor Potter — 2008–2012
Ph. D. Thesis: *Dynamics and stability of rolling viscoelastic tires*

Erica Isaacson — 2008–2012
Ph. D. thesis: *Some periodic solutions of the two-dimensional Stokes–Oldroyd–B system with stress diffusion*

Jia Yu — 2006–2010
Ph. D. thesis: *A local construction of the Smith Normal form of a matrix polynomial, and time-periodic gravity-driven water waves.*

MASTER'S STUDENTS

Ahmad Zareei (Ph. D. student in Mechanical Engineering, master's student in math) Fall, 2018
Master's thesis: *Euler-Schrödinger Transformation*

Pedram Hassanzadeh (Ph. D. student in Mechanical Engineering, master's student in math) Fall, 2012
Master's thesis: *Optimal Transport from Wall to Wall*

Wael Hassan (Ph. D. student in Structural and Earthquake Engineering, master's student in math) Fall, 2010
Master's thesis: *Error analysis of numerical solutions of ordinary differential equations for linear and nonlinear seismic analysis of single degree of freedom concrete structures*

Curt Hansen (Ph. D. student in statistics, master's student in math, via exam) Spring, 2010

Xixi Wang (Ph. D. student in biology, master's student in math, via exam) Fall, 2008

Ahmed H. El-Shaer, (Ph. D. student in Mechanical Engineering, master's student in math) Fall, 2007
Master's thesis: *On the Synthesis of Suboptimal Control Using Galerkin Approximations*.

Christian Linder, (Ph. D. student in Civil Engineering, master's student in math) Fall, 2006
Master's thesis: *Application of differential topology for the derivation of compatibility conservation laws in mechanics*

UNDERGRADUATE STUDENTS

Mandy Huo Fall 2014
Honor's thesis: *Spectral analysis of a second-order transport model*

Monica Jinwoo Kang 2010–2012

Xueyao (Vicky) Liu Fall, 2008
Honor's thesis: *Cytoplasmic polyadenylation switching mechanism*

Yajing Tan 2006–2008
Honor's thesis: *Modeling the Magnetostatic Interaction Matrix*

Cassondra Bluemel Fall, 2005
Honor's thesis: *Discontinuous Galerkin Methods for the 1-D Spherical Neutron Transport Equation*

TEACHING

U. C. Berkeley 2005–present
Math 228B, *Numerical Solution of Differential Euations*. (Spring 2021)
Math 228A, *Numerical Solution of Differential Euations*. (Fall 2020)
Math 16B Lec 001, *Calculus and Analytic Geometry*. (Spring 2020)
Math 16B Lec 002, *Calculus and Analytic Geometry*. (Spring 2020)
Math 128A, *Numerical Analysis*. (Fall 2018)
Math 16B, *Calculus and Analytic Geometry*. (Spring 2018)
Math 224A, *Mathematical Methods for the Physical Sciences, I*. (Fall 2016)
Math 224B, *Mathematical Methods for the Physical Sciences, II*. (Spring 2015)
Math 224A, *Mathematical Methods for the Physical Sciences, I*. (Fall 2014)
Math 128A, *Numerical Analysis, I*. (Fall 2014)
Math 16B, *Calculus and Analytic Geometry*. (Fall 2012)
Math 126, *Partial Differential Equations*. (Fall 2012)
Math 204, *Theory of Ordinary Differential Equations*. (Fall 2011)
Math 128A, *Numerical Analysis.* (Summer 2011)
Math 118, *Fourier Analysis, Wavelets and Signal Processing*. (Spring 2011)
Math 228B, *Numerical Solution of Differential Equations*. (Spring 2011)

TEACHING (CONTINUED)

U. C. Berkeley (continued) 2005–present
- Math 16B, *Calculus and Analytic Geometry*. (Spring 2010)
- Math 204, *Theory of Ordinary Differential Equations*. (Fall 2009)
- Math 118, *Fourier Analysis, Wavelets and Signal Processing*. (Spring 2009)
- Math 1B, *Calculus*. (Fall 2008)
- Math 1A, *Calculus*. (Spring 2008)
- Math 228A, *Numerical Solution of Differential Euations*. (Fall 2007)
- Math 228B, *Numerical Solution of Differential Euations*. (Spring 2007)
- Math 228A, *Numerical Solution of Differential Euations*. (Fall 2006)
- Math 204A, *Theory of Ordinary Differential Equations*. (Fall 2006)
- Math 224B, *Mathematical Methods for the Physical Sciences*. (Spring 2006)
- Math 275, *Topics in Applied Mathematics*. (Fall 2005)

New York University 2003–2004
- Math 63, *Business Calculus* (Spring 2004)
- Math 63, *Business Calculus* (Fall 2003)

PROFESSIONAL ACTIVITIES

Scientific Advisory Board, ICERM 2019–present

Editorial boards
- Pure and Applied Analysis 2018–present
- SIAM Journal on Applied Mathematics 2017–present
- Quarterly of Applied Mathematics 2016–present
- Advances in Computational Mathematics 2016–present

MPS Dean's Working Group to Design and Improve GSI Training Courses at Berkeley 2020-2021
Math Department Representative

Co-Chair of the Graduate Diversity Task Force (UC Berkeley, campus-wide) 2019-2020

Committee on Education, American Mathematical Society 2017–2020

Vice Chair for Graduate Studies, UC Berkeley Mathematics Department 2015–2019

Equity and Inclusion Committee (Math Department) 2018–2019

Academic Senate Committees (UC Berkeley)
- Graduate Council 2016–2020
- Reviewer for Master of Design program 2018
- Carol D. Soc Awards Committee 2018
- Lead Reviewer, Graduate Group in Endocrinology 2017
- Reviewer for Master of Molecular Science and Software Engineering 2016–2017

Systemwide Committees (University of California)
- Coordinating Committee for Graduate Affairs Fall 2017
- Lead reviewer for UCSC MS/PhD Program in Statistical Science 2017–2018

Secretary of SIAM Activity Group on Nonlinear Waves and Coherent Structures 2015,2016

Membership in professional societies
- American Mathematical Society 2017–present
- American Physical Society 2005–present
- Society for Industrial and Applied Mathematics 2002–present
- SIAM Activity Group on Nonlinear Waves and Coherent Structures 2010–present
- SIAM Activity Group on Computational Science and Engineering 2010–present
- SIAM Activity Group on Orthogonal Polynomials 2014–present
- American Geophysical Union 2014–2016

PROFESSIONAL ACTIVITIES (CONTINUED)

Seminar, Workshop and Minisymposium Organizer
- Session chair, *MSRI Workshop: Mathematical problems in fluid dynamics* 2/2021
- Session chair, *Nonlinear waves, singularities, and turbulence in physical and biological systems*
  International Congress on Industrial and Applied Math, (ICIAM 2019, Valencia, Spain) 7/2019
- Organizer for minisymposium on *Applications of Nonlinear Dynamical Systems to Kinetic Plasmas*
  SIAM Conference on Dynamical Systems (Snowbird, Utah) 5/2019
- Organizer for minisymposium on *Nonlinear Kinetic self-Organized Plasma Dynamics Driven by Coherent, Intense Electromagnetic Fields*
  11th IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena (Athens, GA) 4/2019
- Organizer for minisymposium on *Nonlinear Kinetic Waves and Coherent Structures in Vlasov Plasmas*
  SIAM Conference on Nonlinear Waves and Coherent Structures (Anaheim, CA) 6/2018
- Organizer of ICERM Program on *Singularities, Free Boundaries, and Coherent Structures in Incompressible Fluids* (Brown University) Spring, 2017
- session chair (plenary talk), SIAM Conference on Nonlinear Waves and Coherent Structures 8/2016
- Session chair, *Water waves: computational approaches for complex problems*, Banff, Canada 7/2013
- *UC Berkeley Applied Math Seminar* (with A. Chorin) 2005–2012
- *Mathematical Models of Water Waves*, SIAM Conference on Nonlinear Waves, Philadelphia 8/2010
- *Nonlinear waves*, SIAM Annual Meeting, Denver 7/2009
- Session chair, IMA Workshop on Singularities and Singular Geometries 7/2008
- *Asymptotic Analysis and Numerical Modeling*, SIAM CSE Conference, Costa Mesa 2/2007
- *Courant Institute Applied Math Lab Seminar* (with N. Vandenberghe) 2003–2004

NSF CAREER Workshop for Materials Scientists and Engineers 6/2013

Engineering Science Executive Committee (UC Berkeley) 2012–2014

SIAM Student Chapter Advisor (and Founder, UC Berkeley) 2013–present

University Coordinator at UC Berkeley 2009–2015
Department of Energy Computational Science Graduate Student Fellowship

Panelist (graduate admissions / presenting your research / applying for postdocs) 2015–present
Women in Math (Berkeley), California Alliance retreat, REU on PDEs (FIT),
Summer Fellows Program (Berkeley), Berkeley Connect, Math Graduate Student Association

Reviewer for various journals and agencies 2002–present
Acta Applicanda Mathematicae, Applied and Computational Harmonic Analysis,
Communications in Mathematical Sciences, Electronic Transactions on Numerical Analysis,
International Journal for Numerical Methods in Fluids, Journal of Computational Physics,
Mechanics Research Communications, Electronic Journal of Linear Algebra, Computers and Fluids,
European Journal of Mechanics / B Fluids, Bulletin of the Hellenic Mathematical Society,
IMA Journal of Applied Mathematics, Journal of Mathematical Analysis and Applications,
Journal of Fluid Mechanics, Journal of the Mechanics and Physics of Solids, Journal of Nonlinear Science,
Advances in Computational Mathematics, Journal of the Royal Society Interface, Nonlinearity, Fluids,
Pure and Applied Analysis, Communications on Pure and Applied Analysis, Physica A, Physica D,
Vietnam Journal of Mathematics, Mediterranean Journal of Mathematics, Quarterly of Applied Math,
Proceedings of the National Academy of Sciences, SIAM Journal on Applied Mathematics,
SIAM Journal on Matrix Analysis and Applications, Physical Review Letters, DOE SciDac,
DOE ASCR (5 times), NSF Panelist (3 times), U. S. Civilian Research and Development Foundation

Released/maintain code: *gmpfrxx*. (one of the official C++ interfaces for MPFR) 2007–present
unique feature: allows mixing of double precision, MPFR and GMP types in algebraic expressions
MPFR is a package for arbitrary precision arithmetic with correct rounding.
GMP is a package for arbitrary size integer and rational number arithmetic.