Department of Mathematics
University of Utah
155 S 1400 E Room 233
Salt Lake City, UT 84112-0090☎ (801) 585-1637
✉ choheneg@math.utah.edu
http://www.math.utah.edu/~choheneg

Christel Hohenegger

Education

May 2006 **Ph.D. in Mathematics**, *Georgia Institute of Technology*, Atlanta, GA.
DISSERTATION: Small Scale Stochastic Dynamics for Particle Image Velocimetry Applications.
ADVISOR: Peter J. Mucha.

April 2001 **B.S. and M.Sc. in Mathematics**, *ETH Zürich*, Switerland.
THESIS: Energy Estimates and Variational Formulation for Nonreflecting Boundary Conditions.
ADVISOR: Marcus Grote.

Appointments

2010–present **Assistant Professor**, *Department of Mathematics, University of Utah*, Salt Lake City, UT.

2015–2016 **Family Medical Leave**, *Department of Mathematics, University of Utah*, Salt Lake City, UT.

2007–2010 **Research Associate**, *Courant Institute of Mathematical Sciences, New York University*, New York, NY.
Mentor: Michael Shelley

2006–2007 **Postdoctoral Fellow**, *Department of Mathematics, University of North Carolina*, Chapel Hill, NC.
Mentor: Gregory Forest

Publications

[1] S. Cook, C. Hohenegger, and T. Shinar. A micro-macro framework for analyzing steric and hydrodynamic interactions in gliding assays. Accepted, SIAM Multiscale and Modeling Simulation, September 2017.

[2] K. R. Steffen and C. Hohenegger. Nonlocal slender body theory for particles near a wall. Submitted, Fluids, September 2017.

[3] C. H. Tan, M. Carlson, C. Hohenegger, and B. Osting. A finite element approach to fluid sloshing with surface tension. In preparation, September 2017.

[4] C. Hohenegger and S. A. McKinley. Fluid-particle dynamics for passive tracers advected by a thermally fluctuating viscoelastic medium. *Journal of Computational Physics*, 340:688–711, July 2017. http://dx.doi.org/10.1016/j.jcp.2017.03.053.

[5] C. H. Tan, C. Hohenegger, and B. Osting. A variational characterization of fluid sloshing with surface tension. *SIAM Journal on Applied Mathematics*, 77(3):995–1019, June 2017. http://dx.doi.org/10.1137/16M1104330.

[6] C. Hohenegger and S. A. McKinley. Reconstructing complex fluid properties from the behavior of fluctuating immersed particles. Under review, SIAM Applied Mathematics, May 2017.

[7] C. Hohenegger, R. Durr, and D. M. Senter. Mean first passage time in a thermally fluctuating viscoelastic fluid. *Journal of Non-Newtonian Fluid Mechanics*, 242:48–56, April 2017. http://dx.doi.org/10.1016/j.jnnfm.2017.03.001.

[8] C. Hohenegger. On equipartition of energy and integrals of Generalized Langevin Equations with generalized Rouse kernel. *Communications in Mathematical Sciences*, 15(2):539–554, January 2017. http://dx.doi.org/10.4310/CMS.2017.v15.n2.a10.

[9] N. B. Murphy, E. Cherkaev, C. Hohenegger, and K. M. Golden. Spectral measure computations for composite media. *Communications in Mathematical Sciences*, 13(4):825–862, 2015. http://dx.doi.org/10.4310/CMS.2015.v13.n4.a1.

[10] C. Hohenegger, S. Cook, and T. Shinar. Dimensional reduction of a multiscale continuum model of microtubule gliding assays. *SIAM Journal on Applied Mathematics*, 74(5):1338–1353, 2014. http://dx.doi.org/10.1137/140961535.

[11] C. Hohenegger, B. Alali, K. R. Steffen, D. K. Perovich, and K. M. Golden. Transition in the fractal geometry of Arctic melt ponds. *The Cryosphere*, 6:1157–1162, 2012. http://dx.doi.org/10.5194/tc-6-1157-2012.

[12] C. Hohenegger and M. J. Shelley. Dynamics of complex biofluids. In Ben Amar, Goriely, Müller, and Cugliandolo, editors, *New Trends in the Physics and Mechanics of Biological Systems, Les Houches Summer School, Session XCII*, volume 92, chapter 3, pages 65–92. Oxford, 2011.

[13] C. Hohenegger and M. J. Shelley. Stability of active suspensions. *Physical Review E*, 81:046311, 2010. http://dx.doi.org/10.1103/PhysRevE.81.046311.

[14] C. Hohenegger and M. G. Forest. Two-bead microrheology: Modeling protocols. *Physical Review E*, 78:031501, 2008. http://dx.doi.org/DOI:10.1103/PhysRevE.78.031501.

[15] C. Hohenegger and M. G. Forest. Direct and inverse modeling for stochastic passive microbead rheology. In *PAMM*, volume 7. ICIAM, 2007.

[16] C. Hohenegger and P. J. Mucha. Statistical reconstruction of velocity profiles for nanoparticle image velocimetry. *Siam Journal on Applied Mathematics*, 68:239–252, 2007. http://dx.doi.org/10.1137/050648043.

[17] R. Sadr, C. Hohenegger, H. Li, P. J. Mucha, and M. Yoda. Diffusion-induced bias in near-wall velocimetry. *Journal of Fluid Mechanics*, 577:443–456, 2007. http://dx.doi.org/10.1017/S0022112007005150.

[18] W. Bangerth, M. Grote, and C. Hohenegger. Finite element method for time dependent scattering: Nonreflecting boundary conditions, adaptivity, and energy decay. *Computer Methods in Applied Mechanics and Engineering*, 193:2453–2482, 2004. http://dx.doi.org/10.1016/j.cma.2004.01.021.

Presentations

Invited

Nov. 2017 Undergraduate Colloquium, University of Utah.

Oct. 2017 Stochastics Seminar, University of Utah.

Sep. 2017 Applied Mathematics Seminar, University of Utah.

May 2017 Modeling Complex Fluids and Gels Conference, Salt Lake City, UT.

Apr. 2017 University of Arizona, Applied and Computational Mathematics Seminar.

Nov. 2016 Undergraduate Colloquium, University of Utah.

Nov. 2016 Utah State University, Department Colloquium.

May 2016 SIAM MAMS, Philadelphia, PA, Session on Numerical Methods for Low Reynolds Number Suspensions of Passive and Active Particles.

April 2016 University of California, Merced, Applied Mathematics Seminar.

April 2016 Brigham Young University, Applied Mathematics Seminar.

March 2015 SIAM CSE, Salt Lake City, UT, Session on Comp. Approaches and Multi-scale Modeling of Complex Fluids.

May 2014 Frontier Probability Days, Tucson, AZ.

April 2014 University of Wisconsin Madison, Applied Mathematics Seminar.

March 2014 Tulane University, Center for Computational Sciences Seminar.

Jan. 2014 Aspen Center for Physics, Biophysics.

March 2013 University of Florida, Biomathematics Seminar.

Feb. 2013 University of San Diego, Biomechanical Seminar.

Oct. 2012 AMS Southeastern Sectional Meeting, Tulane University, Session on Diffusion Processes in Biology.

Aug. 2012 SIAM LS, San Diego, CA, Session on Biological Locomotion.

May 2012 Frontiers in Applied Mathematics, New Jersey Institute of Technology, NJ.

April 2012 University of Utah, Undergraduate colloquium.

March 2012 University of North Carolina, Chapel Hill, Applied Mathematics Seminar.

Aug. 2011 ICIAM 2011, Vancouver, BC, Canada, Session on Microrheology.

Aug. 2011 ICIAM 2011, Vancouver, BC, Canada, Session on Modeling and Simulation in Biological Fluids.

May 2011 SIAM DS, Snowbird, UT, Session on Dynamics of Microswimmers.

March 2011 Bio-mathematics conference at the University of Florida, Gainesville, FL.

Nov. 2011 Georgia Institute of Technology, Applied Mathematics Seminar.

July 2010 SIAM AM, Pittsburgh, PA.

June 2010 IMA Workshop on Natural Locomotion, Minneapolis, MN.

May 2010 SIAM MAMS, Philadelphia, PA.

March 2010 New Jersey Institute of Technology, Applied Mathematics Seminar.

Jan. 2010 Penn State University, Applied Mathematics Seminar.

Feb. 2009 Rennselaer Polytechnic Institute, Colloquium.

April 2009 AMS Southeastern Sectional Meeting, North Carolina State University, NC.

Contributed

Nov. 2016 69th Annual Meeting of the Division of Fluid Dynamics, Portland, OR, Session on Rheology.

Nov. 2014 67th Annual Meeting of the Division of Fluid Dynamics, San Francisco, CA, Session on Rheology.

Nov. 2012 65th Annual Meeting of the Division of Fluid Dynamics, San Diego, CA, Session on Biofluids.

Co-author

June 2017 Probabilistic Perspectives on nonlinear PDEs, International Centre for Mathematics, Edinburgh, UK (Scott McKinley).

Oct. 2016 AMS Western Fall Sectional Meeting, University of Denver, CO (Scott McKinley).

April 2015 IMACS 9th Ann. Conf. on Nonlinear Evolution Equations and Wave Phenomena, Athens, GA (S. McKinley).

Jan. 2015 Tulane University, Math Colloquium (Scott McKinley).

May 2014 Frontier in Probability Days, Tucson, AZ (Scott McKinley).

April 2014 SoCal Fluids UCLA, Los Angeles, CA (Steve Cook).

May 2013 University of California, Riverside, Applied Math and PDE Seminar (Tamar Shinar).

Conferences, Workshops and Summer Schools

July 2018 Complex Fluids in Biological Systems, Banff International Research Station, Canada.

Jan. 2014 Aspen Center for Physics Winter Conference on Active Fluids, Aspen, CO.

Oct. 2012 Mathematical and Computational Challenges in Cilia- and Flagella-Induced Fluid Dynamics, Columbus, OH.

Nov. 2010 63th Annual Meeting of the Division of Fluid Dynamics, Long Beach, CA.

June 2010 Natural Locomotion in Fluids and on Surfaces: Swimming, Flying and Sliding, IMA, Minneapolis, MN.

Grants

Funded

May 2014 Passive and active suspensions in complex fluids, Collaborative Grants for Mathematicians, Simons Foundation, PI. Award 317887, returned due to subsequently awarded NSF DMS.

Aug. 2014 Collaborative research: Diffusion of foreign particles in complex fluids, NSF DMS Applied Mathematics, PI (co-PI Scott McKinley). DMS-1413378, Amount $166'000, Duration 07/2014-06/2017.

Applied

Nov. 2017 The effects of surface tension on sloshing dynamics, PI (co-PI B. Osting), NSF-DMS, Applied Mathematics.

Teaching Experience

2010–present **Assistant Professor**, *Department of Mathematics, University of Utah*, Salt Lake City, UT.
Engineering Calculus I (MATH 1310): Fall 2012 (45 students), Fall 2016 (35 and 45 students).
Accelerated Engineering Calculus I (MATH 1311): Fall 2017 (17 students).
Engineering Calculus II (MATH 1320): Spring 2013 (35 students).
Calculus III (MATH 2210): Spring 2012 (80 and 70 students).
Differential Equations and Linear Algebra (MATH 2250): Fall 2013 (60 students).
Engineering Vector Calculus and Partial Differential Equations (MATH 3140): Spring 2014 (25 students), Fall 2014 (35 students), Spring 2015 (25 students).
Math Modeling (MATH 5740/6870): Spring 2016 (20 students).
Applied Complex Variables and Asymptotic Methods (MATH 6720): graduate class, Spring 2017 (7 students).
Fluid Dynamics (MATH 6750): graduate class, Fall 2011 (12 students), Fall 2013 (7 students), Fall 2017 (15 students, together with A. Fogelson).
Accelerated Engineering Calculus II (MATH 1280): Fall 2010 (35 students), Spring 2011 (30 students).

Awards

2014 Faculty Undergraduate Teaching Award, Department of Mathematics, University of Utah.

Professional Activities

Service

2017-present Faculty member Graduate Student Committee, Department of Mathematics, University of Utah.

2011-present Chair of the Women in Mathematics Committee, Department of Mathematics, University of Utah.

2012, 2015-2017 Faculty member Graduate Student Recruitment Committee, Department of Mathematics, University of Utah.

2010-2015 Chair of the Departmental Colloquium, Department of Mathematics, University of Utah.

2011-2014 Faculty member ACCESS program for Women in Sciences and Mathematics at the University of Utah: Codes and Cryptography (06/25/2012-06/29/2012, 06/24/2013-06/28/2013, 06/23/2014-06/27/2014) The shape of everything (06/20/2011-06/24/2011).

2017-present Reviewer for International Journal of Mechanical Sciences and Applied Mathematical Modelling.

2010-present Reviewer for Physical Review E and Physical Review Letters.

July 2017 Guest speaker at the Summer Math Program for High School Students, Department of Mathematics, University of Utah.

Dec. 2016 U of U College of Science Department-Driven Course and Curriculum Improvement program Proposals Review.

Sept. 2016 OWLS Women in STEM Panel, University of Utah.

June 2016 Guest speaker at the Summer Math Program for High School Students, Department of Mathematics, University of Utah.

March 2016 Simons Foundation Collaborative Grants Review.

March 2015 Organizer (with E. Lushi): Computational Approaches and Multi-scale Modeling of Complex Fluids, SIAM Conference on Computational Science and Engineering.

Jan. 2015 NSF Panel: UNSOL FY PanelI - CBET/Particulate and Multiphase.

Nov. 2013 Lecturer for Science Day at the U.

Oct. 2013 Presenter Science Night Live (public lecture from the College of Science, University of Utah).

June 2013 Organizer (with S. McKinley and A. Donev): Multiscale computation of fluctuating hydrodynamics and microscale mechanics, SIAM Conference on Mathematical Aspects of Material Sciences.

Oct. 2011 Organizer: Understanding bio-fluids via modeling, simulation and analysis at the AMS Western Sectional Meeting, University of Utah.

Nov. 2010 Lecturer for Science Day at the U.

Students

2017-present Ph.D. Advisor of Nathan Willis together with Braxton Osting, Department of Mathematics.

2016-present Ph.D. Advisor of Chee Han Tan together with Braxton Osting, Department of Mathematics.

2017-present REU Advisor of Adam Lee.

2017-present Honor's thesis and REU Advisor of Alex Henabray.

2017 Member Ph.D. committee of Mehdi Jabbarzadeh, Mechanical Engineering.

2017 Member oral Ph.D. committee of Rebecca Terry, Department of Mathematics.

2017 Member oral Ph.D. committee of Seyed Amir Mirbagheri, Mechanical Engineering.

2017 Member oral Ph.D. committee of Ryan Viertel, Department of Mathematics.

2017 Member Ph.D. committee of Bin Xu, Department of Mathematics.

2017 Member oral Ph.D. committee of Kyle Gaffney, Department of Mathematics.

2016-2017 REU Advisor of Max Carlson together with Braxton Osting.

2016 Member Ph.D committee of Cheryl Zapata-Allegro and Pavel Bezdek, Department of Mathematics.

2016 Member oral Ph.D committee of Priscilla Elizondo, Department of Mathematics.

2015 Member oral Ph.D committee of Kelly MacArthur, Department of Mathematics.

2013-2015 REU Advisor of Dennis Michael Senter, currently a graduate student at UNC Chapel Hill.

2013-2015 Kyle Steffen (advisors Ken Golden and Yekaterina Epstein): graduate research project.

2014 Member oral Ph.D committee of Bin Xu, Department of Mathematics.

2014 Member Ph.D committee of Ross Magi, Department of Mathematics.

2014 Member oral Ph.D committee of Pavel Bezdek and Victor Camacho, Department of Mathematics.

2014 ACCESS mentor of Maria David.

2013-2014 REU Advisor of Ryan Durr.

2013 Member oral Ph.D committee of Cheryl Zapata and Ross Magi, Department of Mathematics.

2012 Member Masters Committee of Katrina Johnson, Department of Mathematics.

2011 REU Advisor of Kyle Steffen together with Ken Golden.

Collaborators

- Scott McKinley, Department of Mathematics, Tulane University
- Braxton Osting, Department of Mathematics, University of Utah
- Tamar Shinar and Steven Cook, Department of Computer Sciences, University of California Riverside