

Amanda A. Howard, Ph.D.

CONTACT INFORMATION	amanda.howard@pnnl.gov http://www.AmandaAHoward.com
RESEARCH INTERESTS	Multiphase flows, suspension flows, computational fluid mechanics, high performance computing, high order numerical methods
PROFESSIONAL APPOINTMENTS	Pacific Northwest National Laboratory, Richland, WA July 2018 – present <i>Post Doctorate Research Associate</i>
EDUCATION	Brown University, Providence, RI <i>Ph.D., Applied Mathematics</i> May 2018 <i>Sc.M., Applied Mathematics</i> May 2014 <ul style="list-style-type: none">• Advisor: Martin Maxey, Professor of Applied Mathematics, Brown University• Dissertation: Numerical simulations to investigate particle dispersion in non-homogenous suspension flows.• Relevant coursework: High Performance Computing, Computational Fluid Dynamics, Numerical Solutions to Partial Differential Equations, Partial Differential Equations, Complex Fluids Stanford University, Stanford, CA <i>B.S., Mathematics</i> June 2012 <i>Minors: Physics and Computer Science</i>
HONORS AND AWARDS	Fellowships and Grant Support XSEDE Startup Allocation for “ <i>Particle dispersion and segregation in suspension flows with bidispersed particle sizes</i> ” project, Primary Investigator. Value: \$2,066.50 August 2017 National Science Foundation Graduate Research Fellowship June 2014 Awards Brown University Graduate Contribution to Community Life Award May 2018 Simon Ostrach Fellowship, Division of Applied Mathematics, Brown University May 2018 Brown University Chapter of the Society of Sigma Xi April 2018 Stanford University Award of Excellence June 2012
PAPERS	Howard, Amanda A. , Maxey, Martin R., & Yeo, Kyongmin (2018). Settling of heavy particles in concentrated suspensions of neutrally buoyant particles under uniform shear. <i>Fluid Dynamics Research</i> , 4, 041401. Howard, Amanda A. & Maxey, Martin R. (2018). Simulation study of particle clouds in oscillating shear flow. <i>J. Fluid Mech</i> , 852, 484-506. Cui, Francis R., Howard, Amanda A. , Maxey, Martin R. & Tripathi, Anubhav (2017). Dispersion of a suspension plug in oscillatory pressure-driven flow. <i>Phys. Rev. Fluids</i> , 2, 094303.
RESEARCH EXPERIENCE	Brown University, Providence, RI January 2013 – present <i>Graduate Research Assistant</i> Studied the dynamics of non-Brownian suspensions of neutrally buoyant particles in a Stokesian microchannel flow. Numerical simulations include both meshless methods using moving least squares approximants and the force coupling method. <ul style="list-style-type: none">• Advisor: Professor Martin Maxey

Sandia National Laboratories, Albuquerque, NM

March 2017

Intern

Worked with a team at the Computer Science Research Institute to develop a scalable module for solving partial differential equations using Generalized Moving Least Squares (GMLS) polynomial approximation, a meshless method that easily allows for high order solutions.

Kobe University/Brown University, Kobe, Japan

August 2015

Instructor

Helped organize and lead a two week summer program in Providence, RI and Kobe, Japan using team projects to teach graduate students fundamentals of high performance computing and three-dimensional visualization.

IPAM, University of California, Los Angeles, CA

June 2011 – August 2011

Research in Industrial Projects for Students

Worked on a team of four students to develop and implement computer code for a volumetric mode sorter based on phase holography for applications in free-space optical communication.

- Advisor: Professor Jorge Balbas, California State University, Northridge

INVITED TALKS

- 2018 *Particle Dispersion in Non-Homogeneous Suspension Flows*
National Institute of Standards and Technology, Gaithersburg, MD
- 2017 *Particle Dispersion in Non-Homogeneous Suspension Flows*
Computational and Applied Math Seminar, Tufts University, Medford, MA

CONTRIBUTED
TALKS AND POSTER
PRESENTATIONS

- 2018 Presentation: *Simulations of suspension flows with a meshless moving least squares scheme*. World Congress on Computational Mathematics, New York, NY
- 2018 Poster: *Simulation study of particle clouds in oscillating shear flow* Women in Mathematics of Materials, Ann Arbor, MI
- 2018 Presentation: *Simulations of suspension flows with a meshless moving least squares scheme*. Joint Mathematics Meetings, San Diego, CA
- 2017 Presentation: *Particle dispersion and segregation in suspension flows with bidispersed particle sizes* APS Division of Fluid Dynamics, Denver, CO
- 2017 Poster: *Implementation of a meshless MLS scheme for simulations of suspension flows* SC17 Women in HPC Workshop, Denver, CO
- 2017 Presentation: *Simulations of Suspension Flows with a Meshless MLS Scheme* 18th International Workshop on Numerical Methods for Non-Newtonian Flows and 3rd Complex Fluids and Flows in Industry and Nature workshop, Vancouver, Canada
- 2017 Presentation: *Investigating Irreversibility in Suspension Flows* Applied Mathematics Graduate Seminar, Brown University, Providence, RI
- 2017 Presentation: *Simulations of Viscous Suspension Flows with a Meshless MLS Scheme* SIAM Conference on Computational Science and Engineering, Atlanta, GA
- 2016 Presentation: *Development of wall layering in non-homogenous suspension shear flows* APS Division of Fluid Dynamics, Portland, OR
- 2016 Presentation: *Particle fluxes and irreversibility due to shear flow in a bidisperse suspension* International Conference on Multiphase Flow, Florence, Italy
- 2016 Presentation: *Simulation study of oscillating particle clouds* Rensselaer Polytechnic Institute Applied Math Days, Troy, NY
- 2015 Presentation: *Particle Dispersion in Non-Stationary Suspension Flows* Applied Mathematics Graduate Seminar, Brown University, Providence, RI
- 2015 Presentation: *Particle dispersion in non-stationary and non-uniform suspension flows* APS Division of Fluid Dynamics, Boston, MA
- 2015 Presentation: *Particle Dispersion in Oscillating Suspension Flows* CRUNCH Seminar, Brown University, Providence, RI
- 2014 Presentation: *Simulation study of suspension plugs in unsteady microchannel flows* APS Division of Fluid Dynamics, San Francisco, CA

2012 Poster: *Volumetric Mode Sorter based on Phase Holography*
 Joint Math Meetings, Boston, MA

TEACHING
 EXPERIENCE

Brown University

2014 – 2017 Workshop leader, Sheridan Center for Teaching and Learning
 2015 Summer Catalyst Summer Program Mathematics Instructor (online course)
 2015 Spring Applied Mathematics 350: Methods of Applied Mathematics I teaching assistant
 2014 Spring Applied Mathematics 350: Methods of Applied Mathematics I teaching assistant
 2014 Spring Guest lecturer, Applied Mathematics 330: Methods of Applied Mathematics I
 2013 Spring Grader, Applied Mathematics 116: Introduction to Scientific Computing

WORKSHOPS
 ATTENDED

May 2018 Women in Mathematics of Materials, University of Michigan, Ann Arbor, MI
 August 2016 Argonne Training Program on Extreme-Scale Computing, Argonne National Laboratory, St. Charles, IL
 June 2016 Summer School on Multiscale Modeling of Materials, Stanford University, Stanford, CA
 May 2014 Collective Dynamics of Particles: from Viscous to Turbulent Flows, International Centre for Mechanical Sciences, Udine, Italy

EDUCATION
 TRAINING

2017 – 2018 Sheridan Center for Teaching and Learning: Head Teaching Consultant for STEM
 2015 – 2017 Sheridan Center for Teaching and Learning: Experienced Teaching Consultant
 2015 – 2016 Sheridan Center for Teaching and Learning Certificate II: Course Design
 2014 – 2015 Sheridan Center for Teaching and Learning Certificate IV: Teaching Consultant
 2013 – 2014 Sheridan Center for Teaching and Learning Certificate I: Reflective Teaching

COMPUTER SKILLS

- Languages: C, C++, R, Python, Matlab
- Libraries: MPI, OpenMP, FFTW, Trilinos, Nanoflann
- Publishing: \LaTeX

OUTREACH AND
 SERVICE

Service to Research Community

Fellowship review panel member, The GEM Fellowship Program 2018
Organizing committee, Women’s Intellectual Network Research Symposium, Brown University, Providence, RI 2017
Referee, Fluid Dynamics Research

Service to Brown University

Organizer, Applied Mathematics Graduate/Undergraduate Mentorship Program 2016 – 2018
Organizer, Scientific Computing in Linear Algebra Reading Group 2016
Graduate student representative, Academic Technology Steering Committee 2015 – 2017
Graduate student representative, Instructional Technology Advisory Board 2015 – 2017
Faculty-Graduate Liaison, Division of Applied Mathematics 2015 – 2016
Workshop leader, New TA Orientation 2015 – 2017
Panelist, Brown AWM Panel on Research and Internship Opportunities for mathematics undergraduate students 2015
Event coordinator, Rose Whelan Society for Women in Math 2014 – 2016

STEM Outreach

Organizer, Women Educators in STEM Discussion Group 2017 – 2018
Judge, AWM Essay Contest (Grades 9-12) 2017
Tutor, Mathematics Resource Center 2013 – 2016
Volunteer, Math NECAP test preparation, Hope High School, Providence, RI 2013

PROFESSIONAL
 ORGANIZATIONS

Association for Women in Mathematics – Founded the Brown University Student Chapter
 Member: APS, SIAM