# Amanda A. Howard

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| CONTACT INFORMATION | Brown University<br>Division of Applied Mathematics<br>182 George St., Box F<br>Providence, RI 02912 | (401) 863-3694<br>amanda_howard@brown.edu<br>http://www.AmandaAHoward.com |

**RESEARCH INTERESTS**

Multiphase flows, suspension flows, computational fluid mechanics, high performance computing, high order numerical methods

**EDUCATION**

**Brown University, Providence, RI**

*Ph.D. Candidate, Applied Mathematics* — Expected May 2018
*Sc.M., Applied Mathematics* — June 2014
- Advisor: Martin Maxey, Professor of Applied Mathematics, Brown University
- Relevant coursework: High Performance Computing, Computational Fluid Dynamics, Numerical Solutions to Partial Differential Equations, Statistical Mechanics, Complex Fluids

**Stanford University, Stanford, CA**

*B.S., Mathematics* — June 2012
- Minors: Physics and Computer Science

**HONORS AND AWARDS**

**Fellowships and Grant Support**

XSEDE Startup Allocation for *"Particle dispersion and segregation in suspension flows with bidispersed particle sizes"* project, Primary Investigator. Value: $2,066.50 — August 2017

National Science Foundation Graduate Research Fellowship — June 2014

**Awards**

Associate Member in Brown University Chapter of the Society of Sigma Xi — June 2014

Stanford University Award of Excellence — June 2012

**PAPERS**

Cui, Francis R., **Howard, Amanda A.**, Maxey, Martin R. & Tripathi, Anubhav (2017). Dispersion of a suspension plug in oscillatory pressure-driven flow. Phys. Rev. Fluids, 2, 094303.

**PROFESSIONAL EXPERIENCE**

**Brown University, Providence, RI** — **January 2013 – present**

*Graduate Research Assistant*

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.
- 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

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| INVITED TALKS | 2017 | *Particle Dispersion in Non-Homogeneous Suspension Flows*<br>Computational and Applied Math Seminar, Tufts University, Medford, MA |
| CONTRIBUTED TALKS AND POSTER PRESENTATIONS | 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*<br>SC17 Women in HPC Workshop, Denver, CO |
| | 2017 | Presentation: *Simulations of Suspension Flows with a Meshless MLS Scheme*<br>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*<br>Applied Mathematics Graduate Seminar, Brown University, Providence, RI |
| | 2017 | Presentation: *Simulations of Viscous Suspension Flows with a Meshless MLS Scheme*<br>SIAM Conference on Computational Science and Engineering, Atlanta, GA |
| | 2016 | Presentation: *Development of wall layering in non-homogenous suspension shear flows*<br>APS Division of Fluid Dynamics, Portland, OR |
| | 2016 | Presentation: *Particle fluxes and irreversibility due to shear flow in a bidisperse suspension*<br>International Conference on Multiphase Flow, Florence, Italy |
| | 2016 | Presentation: *Simulation study of oscillating particle clouds*<br>Rensselaer Polytechnic Institute Applied Math Days, Troy, NY |
| | 2015 | Presentation: *Particle Dispersion in Non-Stationary Suspension Flows*<br>Applied Mathematics Graduate Seminar, Brown University, Providence, RI |
| | 2015 | Presentation: *Particle dispersion in non-stationary and non-uniform suspension flows*<br>APS Division of Fluid Dynamics, Boston, MA |
| | 2015 | Presentation: *Particle Dispersion in Oscillating Suspension Flows*<br>CRUNCH Seminar, Brown University, Providence, RI |
| | 2014 | Presentation: *Simulation study of suspension plugs in unsteady microchannel flows*<br>APS Division of Fluid Dynamics, San Francisco, CA |
| | 2012 | Poster: *Volumetric Mode Sorter based on Phase Holography*<br>Joint Math Meetings, Boston, MA |

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| 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 |

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| WORKSHOPS ATTENDED | 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 |

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| EDUCATION TRAINING | 2017 –  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**

*Referee*, Fluid Dynamics Research

*Organizing committee*, Women's Intellectual Network Research Symposium, Brown University, Providence, RI                 2017

**Service to Brown University**

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| *Organizer*, Applied Mathematics Graduate/Undergraduate Mentorship Program | 2016 – present |
| *Organizer*, Scientific Computing in Linear Algebra Reading Group | 2016 |
| *Graduate student representative*, Academic Technology Steering Committee | 2015 – present |
| *Graduate student representative*, Instructional Technology Advisory Board | 2015 – present |
| *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 – present |

**STEM Outreach**

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| *Organizer*, Women Educators in STEM Discussion Group | 2017 – present |
| *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

Graduate student member: AMS, APS, SIAM