

David Matthew Hall

Assistant Research Professor
Department of Computer Science
1045 Regent Drive 430 UCB
Boulder CO, 80309-0430 USA

Office: ECOT 527
<https://david-matthew-hall.com>
<https://www.linkedin.com/in/david-matthew-hall>
david.hall @ colorado.edu
campus phone: 303-492-6729

RESEARCH INTERESTS

Global Climate Modeling, Computational Physics, High Performance Computing, Machine Learning

EDUCATION

PhD, Physics, University of California Santa Barbara **2007**

Thesis: *Hydrodynamic Self-Consistent Field Theory for Inhomogeneous Polymeric Fluids and Nanocomposites*
Advisors: Sanjoy Banerjee, Glenn Fredrickson, Turab Lookman, and James Langer

MA, Physics, University of California Santa Barbara **2003**

BA, Physics, University of Colorado Boulder **1996**

RESEARCH EXPERIENCE

Assistant Research Professor **2016—**

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF COLORADO BOULDER

Current research focuses on numerical methods for global climate modeling. This includes the development and application of a nonhydrostatic spectral-element model in ACME-HOMME, investigations into mimetic spectral element models, interactive visualizations, and machine learning techniques for climate informatics

Research Associate: Nonhydrostatic Atmospheric Dynamics **2012—2016**

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF COLORADO BOULDER

Developed a prototype nonhydrostatic model of the atmosphere for the CESM and ACME global climate models. Investigated the impacts of a high-order discretization on the CAM-SE atmospheric dynamical core. Developed the transport mini-app, a simplified version of CAM-SE, to facilitate experimentation in model acceleration.

Visiting Scientist **2012—2014**

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER CO

Collaborated with scientists in IMAGe on improvements to the the CAM-SE atmospheric dynamical core

Project Scientist I: Atmospheric Modeling **2010—2012**

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER, CO

Investigated atmospheric models for global climate simulations. Coupled Discontinuous Galerkin (DG) elements with the Yin-Yang overset grid for atmospheric transport. Implemented a three dimensional unstructured-grid DG atmospheric dynamical core. Investigated adaptive mesh refinement for DG solvers. Collaborated with Virginia Tech and U Wyoming.

Postdoctoral Researcher: Immersed Boundary Methods for Biologically Inspired Propulsion **2009—2010**

DEPARTMENT OF AEROSPACE ENGINEERING, UNIVERSITY OF COLORADO, BOULDER, CO

Developed immersed boundary techniques for moving interfaces in bio-locomotive systems and mechanical replicas of those systems. Constructed a near real time solver in C++, CUDA with OpenGL visualization for proscribed fluid-structure interaction from motion captured video. Applied solver to paddling and jetting jellyfish, synthetic pulsatile jets for autonomous underwater vehicles (AUVs) and micro air vehicles (MAVs).

Graduate Research Assistant: Dynamics of Complex Polymer Fluids **2003—2007**

T-DIVISION, LOS ALAMOS NATIONAL LABORATORY, NM & UCSB, DEPARTMENT OF PHYSICS

Developed CFD techniques for self-assembly of molten polymer liquids. Constructed three dimensional Fourier pseudo-spectral code for parallel simulations on Los Alamos supercomputers. Won competitive LANL C.A.R.E. Grant.

Graduate Research Assistant: Stellar Dynamics, Cosmology **2001-2002**

UNIVERSITY OF CALIFORNIA SANTA BARBARA, DEPARTMENT OF PHYSICS

Constructed a finite difference ODE solver for energy released due to neon settling in white dwarf-stars and implications for stellar age determination. Co-authored a paper with Lars Bildsten in the Astrophysical Journal. Investigated general-relativistic cosmological models in curved space-time with James Hartle. Investigated field-theoretic particle production in anti de-Sitter space-time undergoing inflation with Douglas Eardley.

- Undergraduate Research Assistant: High T_C Superconductivity** 1995
 UNIVERSITY OF COLORADO BOULDER, DEPARTMENT OF PHYSICS
 Searched for new high temperature superconducting materials. Constructed a single-crystal characterization apparatus and Lab-View software for device control.
- Undergraduate Research Assistant: Solid-State Optical Cooling** 1993
 UNIVERSITY OF COLORADO BOULDER, DEPARTMENT OF PHYSICS
 Participated in the Research Experience for Undergraduates (REU) program with Dr. Eric Cornell and Dr. Carl Weimann.

TEACHING AND MENTORING

- ABET Retreat Participant** 2016
 Attended ABET accreditation retreat to learn about active learning methods applied to computer science.
- AGU Outstanding Poster Award (OSPA) Liason and Judge** 2016
 Organized OSPA Judges for posters in my session and served as an OSPA judge myself.
- ESSP Poster Conference Judge** 2016
 Judged student posters at the Earth System and Space Science poster conference in Boulder, CO
- DCMIP Summer School Modeling Mentor** 2016
 Participated as a modeling mentor for early career geoscience students and postdocs.
- Thesis Committee Member** 2016
 Member of PhD dissertation committee for Lei Bao in CS/Applied Math and Josh Murphy in CS/LASP
- Science Fair Judge: Boulder Valley School District Regional Science Fair** 2012
 Volunteered as a judge at the regional science fair held at CU university memorial center.
- Science Fair Judge: Peak to Peak Secondary School Science Fair** 2012
 Volunteered as a science fair judge for grades 6—8, at Peak to Peak Charter School in Louisville, Co.
- NCAR SOARS/HIRO (High School Internship & Research Opportunity) Judge** 2011
 Evaluated student scientific posters and gave feedback on poster presentations in Boulder, CO.
- Undergraduate Tutor: Mathematics & Science, Los Alamos NM** 2006
 Tutored students in Mathematics and Physics as a graduate student working at Los Alamos National Lab
- Graduate Teaching Assistant: Physics, Astronomy, and Computer Science** 1999—2003
 UNIVERSITY OF CALIFORNIA SANTA BARBARA, DEPARTMENT OF PHYSICS
 Lead recitation sections in Astronomy, General Relativity, Analog Electronics, Digital Electronics, Natural Science, Physics for non-majors, calculus based Physics, Honors Physics, Physics Lab I, II, & III, and Computer Systems. Received excellent TA evaluations.
- Elementary Tutor, Boulder Homeless Shelter** 1993
 Volunteered at local homeless shelters in Boulder, CO. Taught math to elementary school children.

INDUSTRY EXPERIENCE

- Senior Software Engineer: Lattice Boltzmann Methods for Automotive Fluid Dynamics** 2008—2009
 EXA CORPORATION, BURLINGTON, MA
 Improved parallel CFD solvers for turbulent airflow over vehicles. Improved Lattice-Boltzmann simulation engine for PowerFLOW. Refactored core data-structures for dynamic memory allocation. Redesigned simulator for a new Digital Geometry File (DGF) format. Improved MPI and shared memory communications. Examined fluid flow and heat exchange in turbulent automotive wind tunnel simulations.
- Senior Software Engineer: Micro-fluidics and MEMs** 2007—2008
 COVENTOR INC. CAMBRIDGE, MA
 Improved CAD software for micro-fluidic channel flows and micro-electro-mechanical systems (MEMS). Developed / maintained CoventorWare CFD solvers for two phase microfluidic applications. Designed graphical user interfaces for Fluent and Flow3D solvers. Investigated reduced order methods for fluid-structure interaction (FSI) of immersed elastic membranes. Supported customer designs for inkjet, bubble-jet, MicroTAS, and Bio-MEMS systems. Lead on site customer training and internal technical presentations to train our staff.
- Software Engineer I & II: Remote Sensing and Graphical User Interfaces,** 1996—1999
 HARRIS CORPORATION, GOVERNMENT COMMUNICATIONS SYSTEMS DIVISION, MELBOURNE, FL
 Developed an SAIP Joint-Strike-Fighter (JSF) technology demonstrator for combining digital terrain elevation data (DTED) with remote sensing imagery and automated image registration using C++, Open-GL, JAVA and the SGI Performa toolkit. Constructed graphical user interfaces for an IM-INT imagery database. Developed geometric sensor models for Global Hawk and J-STARS remote sensing platforms. Implemented fast matrix algorithms and sensor models for image orthorectification and image registration in remote sensing applications.

THESIS

- David M. Hall**, Sanjoy Banerjee, Turab Lookman, Glenn Fredrickson **2007**
 Hydrodynamic self-consistent field theory: Computational fluid dynamics for inhomogeneous polymeric fluids and nanocomposites ProQuest Dissertations And Theses:(Ph.D.) University of California, Santa Barbara, 2007.; Publication Number: AAI3252799; Source: Dissertation Abstracts International, Volume: 68-02, Section: B, page: 1030.; 134 p.

JOURNAL ARTICLES

- Alexandra Jahn, Jennifer E. Kay, Marika M. Holland, **David M. Hall**, **2016**
 How predictable is the timing of a summer ice-free Arctic?
Geophysical Research Letters 43.17 (2016): 9113-9120
- David M. Hall**, Paul Ullrich, Kevin Reed, Christiane Jablonowski, Ram Nair, and Henry Tufo **2016**
 Dynamical Core Model Intercomparison Project (DCMIP): Tracer Transport Test Results for CAM-SE.
Quarterly Journal of the Royal Meteorological Society, doi:10.1002/qj.2761
- David M. Hall** and Ramachandran D. Nair **2013**
 Discontinuous Galerkin Transport on the Spherical Yin—Yang Overset Mesh.
Monthly Weather Review, 141, 264-282, 2013
- David M. Hall**, Turab Lookman, and Sanjoy Banerjee **2009**
 Non-Equilibrium Particle Field Simulations of Polymer-Nanocomposite Dynamics
Chemical Engineering Science, 64, Issue 22, Pages 4754—4757, 2009
- David M. Hall**, Sanjoy Banerjee, and James Langer **2007**
 Computational fluid dynamics for inhomogeneous polymeric fluids and nanocomposites
ProQuest" Dissertations & Theses, 3252799, Aug 2007
- David M. Hall**, Turab Lookman, Glenn H. Fredrickson, and Sanjoy Banerjee **2006**
 Hydrodynamic Self-Consistent Field Theory for Inhomogeneous Polymer Melts
Phys. Rev. Lett. 97, 114501, 2006
- David M. Hall**, Turab Lookman, Glenn H. Fredrickson, and Sanjoy Banerjee **2006**
 Numerical Method for Hydrodynamic Transport of Inhomogeneous Polymer Melts.
Journal of Computational Physics, 2006 doi:10.1016/j.jcp.2006.10.027
- Sanjoy Banerjee, V. Badalassi, V. Dwivedi, J.C. Nave, and **David Hall** **2005**
 The Direct Numerical Simulation of Two Phase Flows with Interface Capturing Methods.
Houille Blanche, NUMB 5, pages 41—64, 2005
- Lars Bildsten and **David M. Hall** **2001**
 Gravitational Settling of ²²Ne in Liquid White Dwarf Interiors.
The Astrophysical Journal, 549:L219—L223, 2001

JOURNAL ARTICLES IN PREPARATION

- David M. Hall** **2017**
 A Spectral-Element Vertical Representation of the HOMME Primitive-Equation Model
 To be submitted to *Monthly Weather Review*, spring 2017
- David M. Hall, Mark Taylor, Ram Nair, Paul Ullrich, Henry Tufo** **2017**
 A Nonhydrostatic Spectral-Element Dynamical-Core in ACME-HOMME
 To be submitted to *Journal of Computational Physics*, spring 2017
- Paul A. Ullrich, David M. Hall, et al.** **2017**
 DCMIP2016, Part 1: Models and Equation Sets
 To be submitted to *Geophysical Model Development: Special Issue*, spring 2017
- Paul A. Ullrich, David M. Hall, et al.** **2017**
 DCMIP2016, Part 2: Moist Baroclinic Wave
 To be submitted to *Geophysical Model Development: Special Issue*, spring 2017
- Kevin A. Reed, David M. Hall, et al.** **2017**
 DCMIP2016, Part 3: Idealized Tropical Cyclone
 To be submitted to *Geophysical Model Development: Special Issue*, spring 2017
- Colin Zarzycki, David M. Hall, et al.** **2017**
 DCMIP2016, Part 4: Splitting Supercell
 To be submitted to *Geophysical Model Development: Special Issue* spring 2017

CONFERENCE PROCEEDINGS

- David M. Hall** and Kamran Mohseni **2010**
 Numerical Investigation of the Effects of Imposed Co-flow on Jetting Mechanisms of Hydromedusa Sarsia Tubulosa.
Proceedings of 3rd Joint US-European Fluids Engineering Summer Meeting
 FEDSM-ICNMM, August 2010
- David M. Hall**, Turab Lookman, and Edward Kober **2004**
 Mesoscale Simulation of Copolymer Fluids.
T-Division Activities in Support of the Nuclear Weapons Program, 2004
- David M. Hall** and Sanjoy Banerjee **2004**
 Field Theoretic Simulation of Processing Effects on Self-Assembling Structures in Complex Fluids.
Sixth World Congress of Chemical Engineering, 2004

FUNDING

Funding Summary

Total Awarded: \$1,972,000

Awarded to CU: \$623,000

- DOE DE-FOA-0001204: A Nonhydrostatic Variable Resolution Atmospheric Model in ACME** **2015—2018**
 \$1,901,000 with \$623,462 to CU to develop a variable-resolution nonhydrostatic global atmospheric model for use in the ACME global climate model. (de-facto PI)
- SNL 1553742: Accelerating Climate Modeling for Energy (ACME)** **2015**
 \$70,996. PI on 3 month sub-contract for performance improvements to the ACME atmospheric model.

ALLOCATIONS

- XSEDE ATM140006: Improving the Vertical Representation of CAM-SE** **2016—2017**
 350k SUs (\$12,300 value) on TACC Stampede Supercomputer, 10k SUs Maverick data analytics system
- NERSC Startup: A Variable Resolution Nonhydrostatic Atmospheric Model** **2016**
 50k core hours for development of nonhydrostatic capabilities on NERSC supercomputers
- XSEDE ATM140006: A Nonhydrostatic Global Atmosphere Model** **2014—2015**
 2 Million SUs on TACC Stampede Supercomputer for nonhydrostatic atmospheric model development
- XSEDE ATM130047, Startup: A Nonhydrostatic Model for Climate Prediction** **2013—2014**
 200k SUs on Stampede/Kraken for nonhydrostatic atmospheric model development
- JANUS UCB00000119: Development of a non-hydrostatic atmospheric dynamical core in the HOMME Framework** **2012**
 1 Million SUs for nonhydrostatic atmospheric model development
- JANUS Startup** **2011**
 Supercomputing time for multiscale research project development on CU cluster.
- NSF Keenland Supercomputing Allocation** **2010**
 Supercomputing time on Keenland multi-gpu supercomputer.

PRODUCTS

The HOMME / CAM-SE multicomponent-model

A generalization of the High-Order Method Modeling environment Atmospheric Dynamical Core. Multiple dynamical systems, both hydrostatic and nonhydrostatic. Multiple vertical representations.

VizTool

A data visualization environment for climate model data built upon the PyVTK visualization toolkit and PyQt

MUSE-3D (Multiscale Unified Simulation Environment 3D)

A three dimensional object oriented Discontinuous Galerkin (DG) development environment in C++ for atmospheric modeling applications.

FlowLab (Immersed Boundary Development Environment)

A Fourier pseudo-spectral environment in C++ for immersed boundary applications and fluid-structure interaction. Integrated, near real-time OpenGL/CUDA visualization environment.

Ataxx Arcade

An iOS strategy game based on the original arcade game of the same name written in Objective-C and published on the Apple app store.

HSCFT (Hydrodynamic Self-Consistent Field Theory Solver)

A parallel Fourier pseudo-spectral modeling environment in C for modeling the dynamics of molten copolymer and nano composite complex fluids in 2 or 3 dimensions. Arbitrary geometries, multiple fluid components.

AWARDS

ECSA Travel Grant Travel grant for SIAM Geoscience conference.	2010
Los Alamos National Lab C.A.R.E. Grant Funding from Los Alamos / University of California Cooperative Agreement for Research.	2003
National Merit Scholarship Received full undergraduate tuition scholarship for high achievement on the PSAT/NMSQT exam.	1992—1996
Phi Kappa Phi National Honor Society Inducted into physics honors society for high achievement in undergraduate physics.	1995
REU Scholar Research Experience for Undergraduates Fellowship	1993
National Science Foundation Scholarship Received NSF Fellowship for scholastic achievement in science.	1992
American Academy of Achievement Honored by American Academy of Achievement for top 500 national combined SAT & ACT scores. Participated in award conference in Las Vegas, NV with celebrity hosts.	1992
Valedictorian, Falcon High School Sole valedictorian, Falcon High School in Falcon, CO.	1992
Colorado Programming Competition Won state-level programming competition in Denver, CO, senior year of high school.	1992

PROFESSIONAL SERVICE

AGU Session Convener Organized oral and poster sessions A31A and A34A "Advances in Numerical Methods for Atmosphere and Ocean Modeling" at the AGU Annual Meeting	2016
EGU Session Convener Organized session AS4.20/OS4.4 on Advances in Numerical Methods in Atmospheric and Oceanic Models at the European Geophysical Union General Assembly	2016
Article Reviewer Reviewed journal articles: G-Cubed, the Journal of Computational Physics, and Atmospheric and Ocean Science Letters	2014—
Host of the ACME-HOMME Hackathon Hosted and Organized planning meeting for refactor / cleanup of the ACME-HOMME atmospheric dynamical core.	2015
Organizer: Nonhydrostatic ACME kick-off meeting Hosted and Organized kick-off meeting for the Nonhydrostatic ACME model development project, in Boulder	2015
DOE Proposal Reviewer Reviewed Proposals for the BER section of the Department of Energy	2014

INVITED PRESENTATIONS

The CAM-SE / HOMME Atmospheric Dynamical Core Invited oral presentation at the DCMIP 2016 Summer School in Boulder, CO	2016
A Spectral Representation of the Atmospheric Column in Global Climate Models Invited oral presentation at the American Geophysical Union (AGU) annual meeting, San Francisco, CA	2015
Nonhydrostatic Global Climate Modeling on Exa-Scale Machines Invited seminar at CU-Denver, Center for Computational Mathematics, Denver, CO	2015
Toward Nonhydrostatic High Resolution Global Climate Modeling Invited seminar at Lawrence Berkley National Lab, Berkeley, CA	2014
CFD for Inhomogeneous Polymeric Liquids and Nanocomposites Oral presentation given at Coventor in Cambirdge, MA Oral presentation given at Exa Corp in Burlington, MA Oral presentation given at Eglin Airforce Base in Destin, FL Oral presentation given at Dow Chemical, in Texas Oral presentation given at Toyon Corp. Santa Barbara, CA	2007

CONTRIBUTED PRESENTATIONS

Can a Spectral-Element Column Improve Atmosphere Model Accuracy?	2016
Poster presentation at the AGU 2016 fall meeting.	
Next Generation Technologies in ACME: Immersed Bounds, Deep Learning, and a Unified Workflow	2016
Poster presentation at the ACME 2016 fall meeting.	
A Graphical User Interface for Global Climate Modeling in ACME	2016
Oral presentation to the ACME Workflow Group at the ACME 2016 fall meeting.	
Discovering Governing Equations from Data: Sparse Identification of Nonlinear Dynamical Systems	2016
Oral presentation at the machine learning reading group, CU Boulder	
Improved Topography in the ACME Climate Model Through Immersed Boundaries	2016
Poster presentation at the Advancing X-cutting Ideas for Computational Climate Science (AXICCS) workshop	
A High Order Vertical Representation in CAM-SE	2016
Poster presentation at the Community Earth System Model (CESM) workshop	
Vertical Spectral Elements in the CAM-SE Atmospheric Dynamical Core	2016
Poster presentation at the European Geophysical Union (EGU) General Assembly, Vienna, Austria	
A High Order Vertical Representation for Increased Atmospheric Model Throughput	2015
Poster presentation at the American Geophysical Union (AGU) annual meeting, San Francisco, CA	
Nonhydrostatic Global Climate Modeling on Exa-Scale Machines	2015
Colloquium at CU-Boulder department of Computer Science, Boulder, CO	
A Spectral-Vertical Representation in CAM-SE	2015
Oral presentation at the CESM Atmospheric Working Group Meeting, Boulder CO	
A Nonhydrostatic Atmospheric Dynamical Core in CAM-SE	2014
Oral presentation at the American Geophysical Union (AGU) annual meeting, San Francisco, CA	
Toward Exa-scale Climate Modeling in CAM-SE	2014
Poster presented at the American Geophysical Union (AGU) annual meeting, San Francisco, CA	
A Nonhydrostatic Spectral-Element Atmospheric Dynamical-Core in CAM-SE	2014
Oral presentation at the ICOSAHOM meeting, Salt Lake City, UT	
A Nonhydrostatic Atmospheric Dynamical-Core in CAM-SE	2014
Poster presentation at CESM annual meeting, Breckenridge, CO	
A Nonhydrostatic Spectral-Element Atmospheric Dynamical-Core in CAM-SE	2014
Oral presentation at PDEs on the Sphere, Boulder, CO	
A Nonhydrostatic Atmospheric Model for Climate Prediction in CAM-SE	2013
Oral presentation at American Geophysical Union annual meeting, San Francisco, CA	
A Spectral Element Atmospheric Dynamical-Core Based on the Model of Laprise	2013
Poster presented at CESM annual meeting, Breckenridge, CO	
Toward a Nonhydrostatic Atmospheric Spectral Element Dynamical Core	2013
Oral presentation at SIAM Computer Science and Engineering 2013 conference, Boston, MA	
Evaluating Intel's Many Integrated Core Architecture for Climate Science	2013
Oral presentation at SIAM Computer Science and Engineering 2013 conference, Boston, MA	
A Discontinuous Galerkin Implementation of the Yin-Yang Overset Grid	2012
Poster presentation at Frontiers in Computational Physics Conference, Boulder, CO	
A Discontinuous Galerkin Implementation of the Yin-Yang Overset Grid	2012
Poster presentation at PDEs on the Sphere conference, Cambridge, England	
Yin-Yang + Discontinuous Galerkin Method for Atmospheric Models	2012
Poster presentation at CESM annual meeting	
The Yin-Yang Overset Mesh for Atmospheric Transport on the Sphere	2012
Oral presentation at NCAR MUSE Annual Working Group Meeting	
The Future of MUSE (the Multiscale Unified Simulation Environment)	2011
Oral presentation at NCAR MUSE Annual Working Group Meeting	

An h-p Adaptive Simulation Environment for Atmospheric and Oceanic Sciences Oral presentation at SIAM-Geoscience meeting in Los Angeles	2011
A High-Order, Adaptive, Global Shallow Water Model (for Tsunamis) Oral presentation at SIAM-Geoscience meeting in Los Angeles	2011
Multiscale Computational Fluid Dynamics for Polymeric Liquids Oral presentation for job interview at NCAR, IMAGE	2010
An immersed-Boundary Simulation of Hydromedusa Sarsia Tubulosa Oral presentation given at CU's Aerospace Department	2010
Simulation of Complex Fluid Dynamics Oral presentation given at CU's Aerospace Department	2009
Making effective use of CoventorWare's Bubble-DropSim solver Coventor internal presentation for training purposes	2008
HSCFT: Computational Fluid Dynamics for Inhomogeneous Polymeric Liquids Dissertation defense given at Dept. Physics, University of California, Santa Barbara Oral presentation to Aerosols Group, EES-2, Theoretical Division, Los Alamos Nation Lab	2007
Computational Fluid Dynamics for Inhomogeneous Polymeric Liquids Oral presentation for T-11 B.L.A.B.S. Group Presentation, Los Alamos National Lab	2007
A Diffuse Interface Method for Polymer Fluid Dynamics TSC Capabilities Workshop on Multiphase Flow, Los Alamos National Lab	2006
Hydrodynamic Transport of Inhomogeneous Polymer Melts Oral presentation at Complex Fluid Design Consortium Meeting, Santa Barbara, CA	2006
Structure Development in Phase Separating Complex Systems Oral presentation at American Institute of Chemical Engineering Annual Meeting	2005
Mesoscale Simulation of Copolymer Dynamics Poster presentation at the Energetic Materials Review, Los Alamos National Laboratory	2005
Complex Fluids in Non-Equilibrium Systems T-11 B.L.A.B.S. group presentation, Theoretical Division, Los Alamos National Lab, 2005	2005
Mesoscale Modeling of Complex Fluids in Processing Flows Telluride Group Meeting, Los Alamos National Lab	2005
Hydrodynamic Self-Consistent Field Theory. American Physical Society, Annual March Meeting in Los Angeles, CA	2005
Viscoelastic Microphase-Separation of Diblock-Copolymers Complex Fluid Design Consortium, Santa Barbara, CA	2005
Viscoelastic Flows of Block-Copolymer Melts Poster presented at Energetic Materials Review, Los Alamos National Laboratory	2004
Diblock Copolymer Shear Flow: Coupling Hydrodynamics with SCFT Complex Fluid Design Consortium, Santa Barbara, CA, 2004	2004
Dynamic Evolution of Fluid Nanostructures in Block-Copolymer Systems Advancement to Candidacy Presentation	2003

PROFESSIONAL MEMBERSHIPS

European Geophysical Union	2016—
American Geophysical Union	2013—
SIAM Mathematics Society	2010—2013
American Institute of Chemical Engineers	2005—2007
National Rheological Society	2005—2007
American Physics Society	1992—1996

COMPUTER SKILLS

Primary Programming Languages C++, C, Fortran 90/95/2003, Python, Objective-C, Java, Matlab, cmake
Additional Programming Languages Delphi, Pascal, Visual Basic, Assembly, PERL, LISP, HTML & CSS
High Performance Computing Tools MPI, OpenMP, p-threads, Java-threads, CUDA, OpenCL, Paraview, VisIt, ncl

LANGUAGE SKILLS

English (Native), German (Intermediate), Spanish (Basic)