

Nathaniel Trask

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Education

Ph.D. Applied Mathematics, Brown University, Expected 2015.

M.S. Applied Mathematics, Brown University, 2012.

M.S. Mechanical Engineering, University of Massachusetts, 2010.

B.S. Mechanical Engineering and Applied Mathematics, University of Massachusetts, 2008.

Experience

Brown University, Department of Applied Mathematics, Research Assistant, 2010–present

Pacific Northwest National Lab Visiting Research Assistant, Summer 2012.

University of Massachusetts, Department of Mechanical Engineering, Research Assistant, 2008–2010.

Creare Inc., Consulting Engineer, Fall 2009

Brown University/Kobe University High Performance Computing Summer School

2 week summer exchange teaching HPC fundamentals and implementing spectral element code on the Kei super-computer in Kobe, Japan.

Organizer and lecturer, August 2013

Brown University, Department of Applied Mathematics

Thesis: Large scale implementation of high order meshless methods for simulating multiphase flows

Research Assistant, Martin Maxey and George Karniadakis, Fall 2011–current

Teaching Assistant, Computational linear algebra, Johnny Guzmann, Fall 2012

Teaching Assistant, Introduction to scientific computing, Johnny Guzmann, Spring 2011

Teaching Assistant, Methods for applied mathematics II, Hui Wang, Fall 2010

University of Massachusetts, Department of Mechanical Engineering

Thesis: Implementation of an Eulerian Atomization Model To Characterize Primary Spray Formation

Research Assistant, David Schmidt, Fall 2008–Spring 2010,

Teaching Assistant, Scientific programming, David Schmidt, Fall 2008

Teaching Assistant, Heat transfer, David Schmidt, Spring 2008

Teaching Assistant, Fluid mechanics, Bobba Kumar, Spring 2008

Fields of Research Interest

High performance computing, computational fluid mechanics, numerical PDE, multiphase flow, meshless methods, phase field modelling,

Research

Peer-Reviewed Journal Articles

Nathaniel Trask, David P. Schmidt, Malissa D.A. Lightfoot, Stephen A. Danczyk, Compressible Modeling of the Internal Two-Phase Flow in a Gas-Centered Swirl Coaxial Fuel Injector, *J. Propulsion and Power*, 28(4), 685-693, 2012.

Michael Colarossi, Nathaniel Trask, David P. Schmidt, Mark J. Bergander, Multidimensional Modeling of Two-Phase Condensing Ejector Flow, *Int. J. of Refrigeration*, in press, 2011.

Work in Progress

Nathaniel Trask, Martin Maxey. Accurate stiffly stable projection methods for Smooth Particle Hydrodynamics using algebraic multigrid, 2014.

Nathaniel Trask, Martin Maxey. Arbitrary order moving least squares collocation schemes for solving Navier-Stokes equations, 2014.

Conference and Seminar Presentations

Trask, N., Maxey, M., Parks, M., Xu, J. Smoothed particle hydrodynamics: Stiffly stable projection schemes, consistency corrections, and fast solvers SIAM Annual meeting, July 2013

Trask, N., Maxey, M., Xu, J. Accuracy and performance of implicit projection methods for transient viscous flows using SPH. 8th International SPHERIC workshop. Trondheim, Norway. June, 2013

Garcia-Oliver, J., Pastor, J.M., Pandal, A., Trask, N., Schmidt, D.P., Assessment of an Eulerian atomization model on diesel spray CFD simulations, ICLASS conference proceeds, 2012

Trask, N., Perot, B., Schmidt, D.P., Meyer, T., Lightfoot, M., Danczyk, S., Modeling of the internal two-phase flow in a gas-centered swirl-coaxial fuel injector, AIAA, 48th AIAA Aerospace Sciences Meeting Conference Proceeds, 2010

Trask, N., Schmidt, D.P., Predicting primary atomization of sprays in crossflow using the $\tilde{\epsilon}$ $\tilde{\rho}$ \tilde{Y} model, ILASS Proceeds, 2010

Trask, Implementation of an Eulerian model for turbulent atomization in OpenFOAM, 1st Mid-Atlantic Open-FOAM Users Group Meeting, Penn State 2009

Summer School Participation

Fluid Dynamics: Topics in Turbulence, Center for Scientific Computation and Mathematical Modeling at the University of Maryland, May 24-28, 2010