Jonathan Robey

I am looking for a position as a computational scientist that can use my 10 years of programming computational methods, applied math training and extensive experience with software development, debugging and documentation.

Education

2013–2019 **PhD in Applied Math**, *University of California: Davis*, Davis, *3.75*.

2009–2012 **BS in Applied and Computational Mathematical Sciences**, *University of Washington*, Seattle, *3.40*.

2008–2009 **Concurrent Enrollment classes in math**, *University of New Mexico/Los Alamos*, Los Alamos, *4.0*.

2005–2009 **High School**, *Los Alamos High School*, Los Alamos.

PHD Dissertation

Title On the Design, Implementation, and Use of a Volume-of-Fluid Interface Tracking Algorithm For Modeling Convection and other Processes in the Earth's Mantle

Advisor E. G. Puckett

Experience

TA Positions

UC Davis **MAT 226A**, *Numerical Methods: Fundamentals*, Graduate Level Course, Fall 2017.

UC Davis **MAT 228A**, *Numerical Methods for Partial Differential Equations*, Graduate Level Course.
Fall 2016, Fall 2018. Requested as TA by Professor

UC Davis **MAT 228B**, *Numerical Methods for Partial Differential Equations*, Graduate Level Course.
Winter 2016.

UC Davis **MAT 017 Series**, *Calculus for Biology and Medicine*, Undergraduate Level Courses, Multiple quarters.

UC Davis **MAT 021 Series**, *Calculus for Biology and Medicine*, Undergraduate Level Courses, 2017-2018 year.

UC Davis **MAT 022AL**, *Linear Algebra Computer Lab*, Graduate Level Course, Spring 2017.
Made major update/rewrite to email based grading script

Professional Internships

Fall 2012–Summer 2013 **Intern Computational Scientist**, *Los Alamos National Laboratory*, Los Alamos.
Worked on Miniapps project(writing small scale applications to be open sourced for testing purposes)

Summer 2011 **Intern Computational Scientist**, *Los Alamos National Laboratory*, Los Alamos.
Worked on Miniapps project(writing small scale applications to be open sourced for testing purposes)

Summer 2010 **Intern Computational Scientist**, *Los Alamos National Laboratory*, Los Alamos.
Worked on creating GUI for CLI hydrocode tools

Summer 2009 **Intern Computational Scientist**, *Oak Ridge National Laboratory*, Oak Ridge.
Assesing viability of fault recovery scheme for conjugate gradient solver in POP

Volunteer Activities

Fall 2012 – Summer 2013 **Mentored NM Supercomputing Challenge teams**, *NM Supercomputing Challenge*, Los Alamos.

Trail Work, Food Drive, National Park cleanups.

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Interests

- Volume of Fluid Interface Tracking
- Finite Difference Methods
- Finite Element Methods
- Finite Volume Methods

Computer skills

OS: Windows, Mac, Linux(Primary personal OS)

Software Engineering Tools

Development: GDB, Git, Valgrind

Computer Languages

Fluent: C(>10yrs), C++(>5yrs), CUDA(>7yrs), MPI(>10yrs), Python(>7yrs)

Strong: LaTeX, Paraview, Matlab, Java, FORTRAN

Moderate: OpenGL

Presentations

- J. Robey, E.G. Puckett, *A Volume-of-Fluid Interface Tracking Method for Modelling the Advection of Compositional Fields with Sharp Boundaries in the Mantle Convection Code ASPECT*, Poster. AGU2016, AGU Fall Meeting (December 2016)
- C. Alme, J. Robey, *Enhanced precision sum techniques*, Poster, 10th Annual Student Symposium, Los Alamos National Laboratory (Summer 2010).

Publications

Jonathan M. Robey. *On the Design, Implementation, and Use of a Volume-of-Fluid Interface Tracking Algorithm For Modeling Convection and other Processes in the Earth's Mantle*. PhD thesis, University of California: Davis, September 2019.

Jonathan M. Robey and Elbridge Gerry Puckett. Implementation of a volume-of-fluid method in a finite element code with applications to thermochemical convection in a density stratified fluid in the earth's mantle. *Computers & Fluids*, May 2019.

Elbridge Gerry Puckett, Donald L. Turcotte, Ying He, Harsha Lokavarapu, Jonathan M. Robey, and Louise H. Kellogg. New numerical approaches for modeling thermochemical convection in a compositionally stratified fluid. *Phys. Earth Planet. Inter*, 276:10–35, 2018. Special Issue: 15th SEDI Conference.

Robert W. Robey, Jonathan M. Robey, and Rob Aulwes. In search of numerical consistency in parallel programming. *Parallel Computing*, 37(4):217 – 229, 2011.

Software Contributions

- Volume-of-Fluid advection scheme added to ASPECT
- Multiple minor bugfixes and improvements for Deal.II
- Multiple minor bugfixes and improvements for ASPECT
- Wrote *Sapient*(TVD Lax-Wendroff simple hydrocode w/ real-time graphics output with MPI)

Awards

- Dean's List Autumn 2010, Winter 2011, and Winter 2012, University of Washington, Seattle.
- Presidential Scholar Candidate
- AP Scholar with Honor
- National Merit Finalist
- Eagle Scout 2005; Bronze Palm 2006

References

Former Managers

- Allen McPherson(mcpherson@lanl.gov)
- John Grove(jgrove@lanl.gov)

PHD Advisor

- E.G. Puckett(egpuckett@ucdavis.edu)

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