

## Harsha Lokavarapu

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### Professional Preparation

University of California, Davis	MS	Geology	2017–
		Thesis advisor Louise H. Kellogg	
University of California, Davis	BS	Computer Science	2010-2015
University of California, Davis	Minor	Applied Mathematics	2010-2015

### Appointments

2014-2017	Computational Infrastructure for Geodynamics (CIG)	Junior Assistant
2012	Certify Data Systems (Humana)	Internship as Code Developer

### Computing Skills and Experiences

#### 1. Continuous Integration Tools:

- (a) Jenkins - Java
- (b) Travis

#### 2. Code Development Contributions

- (a) Advanced Solver for Problems in Earth's ConvecTion ([ASPECT](#)) - C++
- (b) [Calypso](#) - Fortran
- (c) Generalized Reservoir Modeling (Ms. Thesis Project) - Python

#### 3. Parallel Processing/High Performance Computing (HPC)

- (a) Message Passing Interface (MPI) - C++/Fortran
- (b) CUDA - C++
- (c) Profilers - gdb, cuda-gdb
- (d) NSF Texas Advanced Computing Center:
  - i. [Stampede](#) and [Stampede 2](#)
  - ii. [Maverick](#)
- (e) Math and Physical Science (MPS) HPC Cluster
  - i. Ymir
  - ii. Peloton
- (f) SLURM - HPC scheduler
- (g) Executed strong and weak scaling tests for
  - i. ASPECT - As part of work associated with DSF paper (not included with published version)

ii. Calypso - published as poster at Fall AGU 2014

4. Outside Interests:

- (a) Virtual Reality - (A-frame) - JavaScript
- (b) 3-D Design/Printing - (Tinkercad)
- (c) Neural Networks - (Kereas, Tensorflow) - Python

**Professional Activities**

2017–	Member	<a href="#">Deep Carbon Observatory</a>
2016	Participant	<a href="#">ASPECT Hackathon</a>
2016	Participant	CIG - <a href="#">All Hands Meeting</a>
2016	Member	Annual Geophysical Union
2015	Participant	<a href="#">ASPECT Hackathon</a>
2015	Member	Annual Geophysical Union
2014	Member	Annual Geophysical Union

## **Publications**

### **Refereed Journal Publications**

#### **Submitted**

L. H. Kellogg, D. L. Turcotte, M. Weisfeiler, H. Lokavarapu<sup>@</sup>, S. Mukhopadhyay, (2018) “Implications of a Reservoir Model for the Evolution of Deep Carbon”, *Earth and Planetary Science Letters*, Ms. Ref. No.: EPSL-D-17-01055

#### **Accepted**

R. Gassmoeller, H. Lokavarapu<sup>@</sup>, E. Heien, E. G. Puckett, and W. Bangerth, (2018) “Flexible and scalable particle-in-cell methods with adaptive mesh refinement for geodynamic computations”, *Geochemistry, Geophysics, Geosystems* manuscript 2018GC007508R [View Accepted Manuscript](#)

#### **Appeared**

E. G. Puckett, D. L. Turcotte, L. H. Kellogg, Y. He<sup>†</sup>, J. M. Robey<sup>\*</sup>, and H. Lokavarapu<sup>@</sup> (2018) “New numerical approaches for modeling thermochemical convection in a compositionally stratified fluid”, Special issue of . *Physics of the Earth and Planetary Interiors* associated with the 15th Studies of the Earth’s Deep Interior (SEDI) Symposium (*Phys. Earth. Planet. In.*) **276**:10–35, 10.1016/j.pepi.2017.10.004 [View Article](#)

### **Poster Presentations**

L. H. Kellogg, H. Lokavarapu<sup>@</sup>, D. L. Turcotte, and S. Mukhopadhyay (2017) “A reservoir model study of the flux of carbon from the atmosphere, to the continental crust, to the mantle”, *Annual Geophysical Union Fall Meeting 2017* [View Abstract](#)

J. Jiang, A. P. Kaloti, H. R. Levinson, N. Nguyen, E. G. Puckett, and H. Lokavarapu<sup>@</sup> (2016) “Benchmark Results Of Active Tracer Particles In The Open Souce Code ASPECT For Modelling Convection In The Earth’s Mantle”, *Annual Geophysical Union Fall Meeting 2016* [View Abstract](#)

E. G. Puckett, D. L. Turcotte, L. H. Kellogg, H. Lokavarapu<sup>@</sup>, Y. He<sup>†</sup>, and J. M. Robey<sup>\*</sup> (2016) “New Numerical Approaches To thermal Convection In A Compositionally Stratified Fluid”, *Annual Geophysical Union Fall Meeting 2016* [View Abstract](#)

H. Lokavarapu<sup>@</sup>, and H. Matsui (2015) “Optimization of Parallel Legendre Transform using Graphics Processing Unit (GPU) for a Geodynamo Code”, *Annual Geophysical Union Fall Meeting 2015* [View Abstract](#)

J. A. Russo, E. H. Studley, H. Lokavarapu<sup>@</sup>, I. Cherkashin, and E. G. Puckett (2014) “A New Monotonicity-Preserving Numerical Method for Approximating Solutions to the Rayleigh-Benard Equations”, *Annual Geophysical Union Fall Meeting 2014* [View Abstract](#)

H. Lokavarapu<sup>@</sup>, H. Matsui, and E. M. Heien (2014) “Parallelization of the Legendre Transform for a Geodynamics Code”, *Annual Geophysical Union Fall Meeting 2014* [View Abstract](#)

<sup>@</sup>Undergraduate Student

<sup>\*</sup>Graduate Student

<sup>†</sup>Postdoctoral Scholar

## **Educational Details:**

### **Math Courses**

- 21B - Differential Calculus
- 21C - Integral Calculus
- 21D - Vector Analysis
- 22A - Linear Algebra
- 22B - Differential Equations
- 118A - Partial Differential Equations
- 118B
- 125A - Real Analysis (Foundations of Calculus)
- 125B
- 135A - Probability
- 150A - Modern Algebra
- 150B
- 167 - Advanced Linear Algebra: Matrix Methods in Data mining and Pattern Recognition
- 228A - Computational methods for Differential Equations

### **Computer Science Courses**

- 10 - Concepts of Computing
- 20 - Discrete Mathematics for Computer Science
- 30 - Introduction to Programming and Problem Solving
- 40 - Software and Object-Oriented Programming
- 50 - Machine Dependent Programming
- 60 - Data Structures and Programming
- 120 - Theory of Computation
- 122A - Algorithm Design
- 140A - Programming Languages
- 150 - Operating Systems
- 152A - Computer Networks
- 153 - Computer Security

- 154A - Computer Architecture
- 158 - Parallel Architectures
- 170 - Artificial Intelligence
- 188 - Ethics in an Age of Technology