

Darcy E. Ogden

Earth & Planetary Sciences Department
University of California, Santa Cruz
1156 High Street
Santa Cruz, CA 95064

dogden@es.ucsc.edu
phone (831) 459-5778
fax (831) 459-3074
<http://es.ucsc.edu/~dogden>

Research Interests

Computational geoscience and fluid dynamics

Major Research Accomplishments

Quantified the effect of vent pressure on volcanic plumes

Determined a new mechanism for pyroclastic flow generation in buoyant plumes

Education

University of California, Santa Cruz, Santa Cruz CA

Ph.D. Earth Sciences (Geophysics), June 2008

Thesis: Fluid dynamics of high pressure volcanic eruptions

M.S. Earth Sciences, June 2004

Thesis: Effects of radiogenic heating in geodynamo simulations

Amherst College, Amherst MA

B.A. Geology, May 2001

Research Experience

Graduate Student Researcher, UC Santa Cruz, 2002-present

Ph.D. thesis research with Gary Glatzmaier (advisor), Ken Wohletz and Emily Brodsky using computational simulations of volcanic jets to quantify the effects of vent pressure on the fluid dynamics of eruption columns

M.S. thesis research with Gary Glatzmaier on the effects of radiogenic heating on the fluid motions in the Earth's core and the resulting magnetic field

Visiting Researcher, Los Alamos National Laboratory, 2004

Research with Ken Wohletz benchmarking computational simulations of volcanic plumes

Teaching and educational outreach

Teaching Assistant, Earth & Planetary Sciences Dept., UC Santa Cruz

Introduction to Scientific Computing, 2007, 2006, (EART 119)

Earth as a Chemical System Laboratory (Mineralogy), 2005, 2003, (EART 110M)

Evolution of the Earth Laboratory, 2003, (EART 110L)

Expanding Your Horizons – Exposing high school girls to careers in math and science

Planning committee, 2006

Workshop leader, 2005-2007

Teaching Assistant, Geology Department, Amherst College, Amherst, MA

Hydrogeology, 2001

Mineralogy, 2000

Principles of Geology, 2000

Professional activities

Convener, special session, "Explosive Eruption Dynamics: Recent Advances and Future Directions," American Geophysical Union Fall Meeting 2007.

Organizer Whole Earth Seminar lecture series, Fall 2007, Earth and Planetary Sciences Department, University of California Santa Cruz.

Reviewer for *Geophys. Res. Lett.*, *J. Geophys. Res.* and *Mar. Pet. Geol.*

Computational research skills

5 years of experience writing and running computational fluid dynamics codes on high performance parallel supercomputers

Skilled user (including debugging and modification) of CFDLib, a parallel, 2- and 3D, finite volume computational fluid dynamics code developed by the Theoretical Fluid Dynamics group at Los Alamos National Laboratory

Highly proficient with FORTRAN90, IDL, and Tecplot. Parallel programming using MPI (Message Passing Interface). Operating systems experience UNIX, LINUX, Mac OSX, Microsoft Windows. Other software and languages: MS Office (Excel, Word, PowerPoint) and LaTeX, some experience with TotalView, MATLAB, ArcView GIS, and AVS.

Publications

Ogden, D.E., Glatzmaier, G.A., Wohletz, K.H., 2008. Effects of vent overpressure on buoyant eruption columns: Implications for plume stability. *Earth Planet. Sci. Lett.*, 268 (3-4), 283-292.

Ogden, D.E., Wohletz, K.H., Glatzmaier, G.A., & Brodsky, E.E., 2008. Numerical simulations of volcanic jets: Importance of vent overpressure. *J. Geophys. Res.*, 113, B02204.

Ogden, D.E., Glatzmaier, G.A., Coe, R.S., 2006. The effects of different parameter regimes in geodynamo simulations. *Geophys. Astrophys. Fluid Dyn.*, 100, 107-120.

Glatzmaier, G.A., Ogden, D.E., Clune, T.L., 2004. Modeling the Earth's Dynamo, in *State of the Planet: Frontiers and Challenges in Geophysics*, Geophysical Monograph 150, eds R.S.J. Sparks, C.J. Hawkesworth, IUGG 19, 13-24.

Abstracts

Ogden, D.E., Glatzmaier, G.A., Wohletz, K.H., Brodsky, E.E., Computational models of overpressured volcanic plumes: Implications for ash dispersion. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract V21E-04, 2007.

Ogden, D.E., Wohletz, K.H., Brodsky, E.E., & Glatzmaier, G.A., The influence of eruptive fluid pressure and vent radius on the eruption style of high-pressure supersonic volcanoes, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract V43C-1817, 2006.

Wohletz, K.H., Ogden, D.E., & Glatzmaier, G.A., Preliminary numerical simulations of nozzle formation in the host rock of supersonic volcanic jets. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract V41C-1748, 2006.

Peterson, A.H., Wohletz, K.H., Ogden, D.E., Gisler, G., Glatzmaier, G.A., SAGE validations of volcanic jet simulations, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract V43C-1819, 2006.

- Ogden, D.E., Wohletz, K.H., Glatzmaier, G.A. & Peterson, A.H., Preliminary benchmarking of numerical simulations of the supersonic behavior of plinian eruptions, Eos Trans. AGU, 86(52), Fall Meet. Suppl., Abstract V34B-07, 2005.
- Peterson, A.H., Ogden, D.E., Wohletz, K.H., & Glatzmaier, G.A., Preliminary benchmarking of plinian eruption simulations using an adaptive grid eulerian technique, Eos Trans. AGU 86(52), Fall. Meet. Suppl. Abstract V31D-0647, 2005.
- Ogden, D.E., Wohletz, K.H., & Glatzmaier, G.A., An approach to the turbulent multifield/multiphase dynamics of volcanic conduits and plumes, EOS Trans AGU 85(47), Fall Meet. Suppl., Abstract V33D-1484, 2004.
- Ogden, D.E. & Glatzmaier, G.A., The effects of radiogenic heating in geodynamo simulations. Eos Trans. AGU, 84(46), Fall Meet. Suppl., Abstract T31G-07, 2003.