

CURRICULUM VITAE

Updated: 10/23/09

Scott D. King

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EDUCATIONAL EXPERIENCE:

Ph.D., Geophysics, California Institute of Technology, September 1990
 Thesis Advisor: Bradford H. Hager
 Thesis Title: *The interaction of subducting slabs and the 670 kilometer discontinuity*

B.A. (Honors), Geology, University of Chicago, June 1985
 Thesis Advisor: Frank M. Richter
 Thesis Title: *$Th_{230} - U_{238}$ disequilibrium and melt segregation: A numerical model*

B.A., Applied Mathematics, University of Chicago, June 1985

PROFESSIONAL EXPERIENCE:

Professor of Geophysics, Virginia Polytechnic Institute and State University, September 2007-present

Professor of Geophysics, Purdue University, September 2002-August 2007

Associate Professor of Geophysics, Purdue University, September 1997-August 2002

Assistant Professor of Geophysics, Purdue University, January 1992-August 1997

Green Scholar Postdoctoral Fellow, Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, October 1990-December 1991

Research Assistant, Seismological Laboratory, California Institute of Technology, September 1985-September 1990

Research Assistant with Dr. Michael Minkoff, Mathematics and Computer Science Division, Argonne National Laboratory, June 1985-September 1985

Undergraduate Research Assistant with Dr. Frank Richter, Department of Geophysical Sciences, University of Chicago, September 1984-June 1985

Undergraduate Research Assistant with Dr. Douglas MacAyeal, Department of Geophysical Sciences, University of Chicago, June 1984-June 1985

AWARDS AND HONORS:

University Faculty Scholar, Purdue University	July 2004-June 2007
Summer Faculty Research Fellow, Argonne National Laboratory	June 1993-August 1993
Green Scholar, Scripps Institution of Oceanography	October 1990-December 1991
B.A. with Honors, University of Chicago	June 1985
Illinois State Scholar	September 1981-June 1985
Argonne Scholarship	September 1981-June 1985

MEMBERSHIPS IN PROFESSIONAL SOCIETIES:

American Geophysical Union

member since 1987

CITATION SUMMARY (Thomson ISI Web of Science, October, 17, 2009):

- >1268 total citations
- h-index: 19
- three papers with 100 or more citations
- ten papers with 50 or more citations

PUBLICATIONS:

- [56] Lee, C., and S. D. King, Why are high Mg# andesites widespread in the western Aleutians?; A numerical model approach, *Geology*, submitted.
- [55] King S. D., C. Lee, P. E. van Keken, W. Leng, S. Zhong, E. Tan, E., M. Gurnis, N. Tosi, and M. C. Kameyama, A community benchmark for 2D Cartesian compressible convection in the Earth's mantle, *Geophys. J. Int.* in press.
- [54] King, S. D., On topography and geoid from 2D stagnant-lid convection calculations, *Geochem. Geophys. Geosyst.*, 10, Q3002, 2009. doi:10.1029/2008GC002250
- [53] Lee, C., and S. King, Effect of mantle compressibility on the thermal and flow structures of the subduction zones, *Geochem. Geophys. Geosyst.*, 10, Q1006, 2009. doi:10.1029/2008GC002151
- [52] Van Keken, P. E., C. Currie, S. D. King, M. D. Behn, A. Cagniole, J. He, R. F. Katz, S-C, Lin, E. M. Parmentier, M. Spiegelman, K. Wang, A Community Benchmark for Subduction Zone Modeling, *Phys. Earth. Planet. Int.*, 171, 187-197, 2008.
- [51] King, S. D., Pattern of Lobate Scarps on Mercury's Surface Reproduced by a Model of Mantle Convection, *Nature Geosci.*, 1, 229-232, 2008.
- [50] King, S. D., Slab Sliding Away, *Nature (News & Views)*, 451, 899-900, 2008.
- [49] Redmond, H. L and S. D. King, Parameterized Thermal History Calculations vs. Full Convection Models: Applications to the Thermal Evolution of Mercury, *Phys. Earth Planet. Int.*, 164, 221-231, 2007.
- [48] King, S. D., Mantle Downwellings and the Fate of Subducting Slabs: Constraints from Seismology, Geoid, Topography, Geochemistry, and Petrology, in *Treatise on Geophysics, Volume 7, Mantle Dynamics*, pp. 325-370, 2007.
- [47] King, S. D. and H. L. Redmond, The Structure of Thermal Plumes and Geophysical Observations, in Foulger, G.R. and Jurdy, D. *Plates, Plumes & Planetary Processes, GSA Special Publication 430*, 103-120, 2007.
- [46] King, S. D., Hotspots and Edge-Driven Convection, *Geology*, 35, 223-226, 2007.
- [45] King, S. D., North Atlantic Topographic and Geoid Anomalies: The Result of a Narrow Ocean Basin and Cratonic Roots? in Foulger, G.R., Natland, J.H., Presnall, D.C., and Anderson, D.L., eds., *Plates, Plumes, and Paradigms: Geological Society of America Special Publication 388*, 653-664, 2005.
- [44] Koglin Jr., D. E., S. Ghias, S. D. King, G. T. Jarvis, J. P. Lowman, Mantle Convection with Mobile Plates: A Benchmark Study, *Geochem. Geophys. Geosyst.*, 6, Q09003, doi:10.1029/2005GC000924, 2005.
- [43] King, S. D., Archean Cratons and Mantle Dynamics, *Earth Planet. Sci. Lett.*, 234, 1-14, 2005.
- [42] Van Keken, P. E., and S. D. King, Thermal Structure and Dynamics of Subduction Zones: Insights from Observations and Modeling, *Phys. Earth Planet. Int.*, 149, 1-6, 2005.

- [41] Redmond, H. L. and S.D. King, A numerical study of a mantle plume beneath the Tharis Rise: Reconciling dynamic uplift and lithospheric support models, *J. Geophys. Res.*, 109, E09008, 2004.
- [40] Lowman, J.P., S.D. King, and C.W. Gable, Steady plumes in viscously stratified, vigorously convecting, 3D numerical mantle convection models with mobile plates, *Geochem. Geophys. Geosyst.*, 5(1), 10.1029/2003GC000583, 2004.
- [39] Tackley, P.J., and S.D. King, Testing the tracer ratio method for modeling active compositional fields in mantle convection simulations, *Geochem. Geophys. Geosyst.*, 4(4), 10.1029/2001GC000214, 2003.
- [38] Lowman, J.P., S.D. King, and C.W. Gable, The role of the heating mode of the mantle in periodic reorganizations of the plate velocity field, *Geophys. J. Int.*, 152, 455-467, 2003.
- [37] Soofi, M., and S.D. King, Post-Rift Deformation of the Midcontinent Rift Under Grenville Tectonism, *Tectonophysics*, 359/3-4, 209-223, 2002.
- [36] Soofi, M., and S.D. King, Oblique convergence between India and Eurasia, *J. Geophys. Res.*, 107, 10.1029/2001JB000636, 2002.
- [35] King, S.D., J.P. Lowman, and C.W. Gable, Episodic tectonic plate reorganizations driven by mantle convection, *Earth Planet. Sci. Lett.*, 203, 83-91, 2002.
- [34] King, S.D., Geoid and topography over subduction zones: The effect of phase transformations, *J. Geophys. Res.*, 107, 10.1029/2000JB000141, 2002.
- [33] King, S.D., Subduction: Observations and geodynamic models, *Phys. Earth, Planet. Int.*, 127, 9-24, 2001.
- [32] Lowman, J.P., S.D. King, C.W. Gable, The influence of tectonic plates on mantle convection patterns, temperature and heat flow, *Geophys. J. Int.*, 146, 619-637, 2001.
- [31] King, S.D., and J. Ritsema, African hotspot volcanism: Small-scale convection in the upper mantle beneath cratons, *Science*, 290, 1137-1140, 2000.
- [30] Kim, H., and S.D. King, The study of local time and longitude variability of the amplitude of the equatorial electrojet observed in POGO satellite data, *Earth Planet. Space*, 51, 373-381, 1999.
- [29] Soofi, M., and S.D. King, A modified beam analysis effect of lateral forces on lithospheric flexure and its implications for post-rift evolution of the Midcontinent Rift System, *Tectonophysics*, 306, 149-162, 1999.
- [28] King, S.D. and D.L. Anderson, Edge driven convection, *Earth Planet. Sci. Lett.*, 160, 289-296, 1998.
- [27] Ita, J.J. and S.D. King, The influence of thermodynamic formulation on simulations of subduction zone geometry and history, *Geophys. Res. Lett.*, 125, 1463-1466, 1998.
- [26] Chen, J., and S.D. King, The influence of temperature and depth dependent viscosity on geoid and topography profiles from models of mantle convection, *Phys. Earth Planet. Int.*, 106, 75-91, 1998.
- [25] King, S.D., Geoid and topographic swells over temperature-dependent thermal plumes in spherical-axisymmetric geometry, *Geophys. Res. Lett.*, 24, 3093-3096, 1997.
- [24] van Keken, P.E., S.D. King, H. Schmeling, U.R. Christensen, D. Neumeister, and M.-P. Doin, A comparison of methods for the modeling of thermochemical convection, *J. Geophys. Res.*, 102, 22,477-22,495, 1997.

- [23] Kellogg, L.H., and S.D. King, The effect of temperature dependent viscosity on the structure of new plumes in the mantle: Results of a finite element model in a spherical, axisymmetric shell, *Earth Planet. Sci. Lett.*, 148, 13-26, 1997.
- [22] King, S.D., S. Balachandar, and J.J. Ita, Using eigenfunctions of the two-point correlation function to study convection with multiple phase transformations, *Geophys. Res. Lett.*, 24, 703-706, 1997.
- [21] King, S.D., and N. Christensen, Physical properties of rocks. In: *Encyclopedia of Earth Sciences*, E. Julius Dasch (ed.), MacMillan, New York, 1996.
- [20] King, S.D., and D.L. Anderson, An alternative mechanism of flood basalt formation, *Earth Planet. Sci. Lett.*, 136, 269-279, 1995.
- [19] King, S.D., Models of mantle viscosity. In: *Mineral Physics and Crystallography: Handbook of Physical Constants*, AGU Reference Shelf 2, T.J. Ahrens (ed.), American Geophysical Union, Washington, DC, 227-236, 1995.
- [18] King, S.D., The viscosity structure of the mantle. In: *Reviews of Geophysics (Supplement) U.S. Quadrennial Report to the IUGG 1991-1994*, 11-17, 1995.
- [17] King, S.D., Numerical journey to the Earth's interior, *IEEE Journal of Comput. Sci. Eng.*, 2, 12-23, 1995.
- [16] King, S.D., Radial models of mantle viscosity: Results from a genetic algorithm, *Geophys. J. Int.*, 122, 725-734, 1995.
- [15] King, S.D., Where in Earth do flood basalt come from?. In: *Plume 2*, D.L. Anderson, S.R. Hart, and A.W. Hofmann (Convenors), Terra Nostra, 3/1995, 79-82, Alfred-Wegener-Stiftung, Bonn, 1995.
- [14] King, S.D., and J.J. Ita, The effect of slab rheology on mass transport across a phase transition boundary, *J. Geophys. Res.*, 100, 20,211-20,222, 1995.
- [13] King, S.D., and J.J. Ita, Subduction and volatile recycling in Earth's mantle. In: *Conference Proceedings No. 341: Volatiles in the Earth and Solar System*, K.A. Farley (ed.), American Institute of Physics, New York, 33-44, 1995.
- [12] King, S.D., and B.H. Hager, Subducted slabs and the geoid: 1) Numerical calculations with temperature-dependent viscosity, *J. Geophys. Res.*, 99, 19,843-19,852, 1994.
- [11] King, S.D., Introduction to the Special Section on the Transition Zone, *J. Geophys. Res.*, 99, 15,779-15,782, 1994.
- [10] Ita, J., and S. King, The sensitivity of convection with an endothermic phase change to the form of governing equations, initial conditions, aspect ratio, and equation of state, *J. Geophys. Res.*, 99, 15,919-15,938, 1994.
- [9] Kellogg, L.H., and S.D. King, Effect of mantle plumes on the growth of D" by reaction between the core and the mantle, *Geophys. Res. Lett.*, 20, 379-382, 1993.
- [8] King, S.D., Seeing the mantle in the round, *Nature (News and Views)*, 361, 688-689, 1993.
- [7] King, S.D., and G. Masters, An inversion for radial viscosity structure using seismic tomography, *Geophys. Res. Lett.*, 19, 1551-1554, 1992.
- [6] Staudigel, H., and S.D. King, Ultrafast subduction: The key to slab recycling efficiency and mantle differentiation?, *Earth Planet. Sci. Lett.*, 109, 517-530, 1992.

- [5] King, S.D., C. Gable, and S. Weinstein, Models of convection driven tectonic plates: A comparison of methods and results, *Geophys. J. Int.*, 109, 481-487, 1992.
- [4] King, S.D., and B.H. Hager, The relationship between plate velocity and trench viscosity in Newtonian and power-law subduction calculations, *Geophys. Res. Lett.*, 17, 2409-2412, 1990.
- [3] King, S.D., A. Raefsky, and B.H. Hager, ConMan: Vectorizing a finite element code for incompressible two-dimensional convection in the Earth's mantle, *Phys. Earth Planet. Int.*, 59, 195-208, 1990.
- [2] King, S.D., and B.H. Hager, Coupling of mantle temperature anomalies and the flow pattern in the core: Interpretation based on simple convection calculations, *Phys. Earth Planet. Int.*, 58, 118-125, 1989.
- [1] MacAyeal, D.R., S. Shabtaie, C.R. Bentley, and S.D. King, Formulation of ice shelf dynamic boundary conditions in terms of a coulomb rheology, *J. Geophys. Res.*, 91, 8188-8191, 1986.

TECHNICAL REPORTS, BOOK REVIEWS, AND UNPUBLISHED MANUSCRIPTS:

- King, S.D., A book review of Dynamic Earth Plates, Plumes and Mantle Convection by Geoff Davies, *EOS, Trans. AGU*, 2000.
- King, S.D., A book review of Physics for Geologists by Richard Chapman, *Geology*, 105, 4, 515, 1997.
- King, S.D., A book review of Physics of the Earth by Frank Stacey, *EOS, Trans. AGU*, 76, 8, 80, 1995.
- King, S.D., and D.A. Yuen, A special AGU session on High Performance Computing (HPC) in the Geosciences, *EOS, Trans. AGU*, 75, 47, 546-547, 1994.
- King, S.D., R. Lucas, and A. Raefsky, Using a multifrontal sparse solver in a high performance finite element code, Unpub. manuscript.
- King, S.D., and H. Staudigel, Plate velocity and subduction rate: The key to mantle differentiation?, *The Plume Handbook*, 1991 (presented at Caltech Plume Symposium, May 2-4).
- King, S.D., A book review of Physical Fluid Dynamics by D. J. Tritton, *PAGEOPH*, 132, 4, 820, 1990.
- Crane, R.L., M. Minkoff, K.E. Hillstrom, and S.D. King, Performance modeling of large-grained parallelism, Argonne National Laboratory Technical Memorandum No. 63, March 1986.

INVITED LECTURES AND CONFERENCES:

- Invited Talk – *Geophysical Observations and Mantle Plumes*, Geological Society of America Penrose Conference, *Plumes and their Role in Whole Mantle Convection and Recycling*, Pico, The Azores, May 14, 2009.
- Invited Talk – Mobile Plates and Work: Convection Models with Geophysical Constraints, 33rd International Geological Congress, Oslo, Norway, August 14, 2008.
- Department Seminar – *Mercury and Mars: A Geodynamical Tale of Two Planets*, Bayreuth University, Bayreuth Germany, May 15, 2008.
- Department Seminar – *Mantle Convection and Equation of State Calculations: Where We Stand*, Department of Geology, University of Maryland, February 29, 2008.
- Department Seminar – *The Good, The Bad, and The Ugly: Surface Deformation from a Planetary Perspective*, Department of Geological Sciences, Northwestern University, November 3, 2006.
- Invited Plenary Lecture – *Mantle Convection and Equation of State Calculations: Where We Stand* (Invited Plenary

- Lecture), German Mineralogical Society, Hanover, Germany, September 25, 2006.
- Department Seminar – *The Good, The Bad, and The Ugly: Surface Deformation from a Planetary Perspective*, Department of Earth and Atmospheric Science, Saint Louis University, February 14, 2006.
- Department Seminar – *The Good, The Bad, and The Ugly: Surface Deformation from a Planetary Perspective*, Department of Geosciences, Virginia Tech, February 2, 2006.
- Department Seminar – *The Good, The Bad, and The Ugly: Surface Deformation from a Planetary Perspective*, Rosentiel School of Marine and Atmospheric Science, University of Miami, January 23, 2006.
- Invited Lecture – *How Many Hotspots Can be Explained by Edge Driven Convection*, at *The Great Plume Debate*; AGU Chapman Conference, Fort William, Scotland, 28 August – 1 September 2005.
- Invited Lecture – *Dynamic Feedback Between Plates and Convection: Observations and Models*, at the 4th Deep Earth Research Conference: Lithosphere-Asthenosphere Interaction, Villa Clythia, Fréjus (Nice), France, 28 May – 1 June 2005.
- Departmental Seminar – *Convection and Equations of State*, Bayreuth University, Bayreuth Germany, May 27, 2005.
- Departmental Seminar– *Mobile Plates and Mantle Convection: Theory, Models, and Outright Speculation*, Institute for Geophysics, University of Texas, March 25, 2005.
- Departmental Seminar – *The Quest to Understanding Why Earth Has Plate Tectonics and Venus and Mars Do Not*, Computational and Applied Mathematics Seminar, Purdue University, February 18, 2005
- Participant, Hemispheres Apart: The Origin and Modification of the Martian Crustal Dichotomy, Houston, TX, September 30-October 1, 2004.
- Participant, Frontiers in Appalachian Geology: Earthscope Workshop, Arlington VA, September 10-11, 2004.
- Invited Participant – Chicago 2004: A NASA workshop on diversity, Chicago, IL, June 28-29, 2004.
- Participant, NSF EAR Cyberinfrastructure Workshop, Washington DC, May 2004.
- Invited Lecture – *Plume Convection: What happens when you add all that icky stuff?*, Penrose Conference, Plume IV: Beyond the Plume Hypothesis, August 25-29, 2003.
- Invited Talk – *Thoughts on the formation of Tharsis Rise, Mars*, Leeds University, Leeds, UK. August 4, 2003.
- Invited Participant – *Don L. Anderson 70th Birthday Symposium*, Caltech, March 2-6, 2003.
- Invited Lecture – *Sudden Plate Reorganizations in a 3D Convection Model with Plates*, Department of Terrestrial Magnetism, Carnegie Institution of Washington, November 20, 2002.
- Invited Participant – *MARGINS Workshop on the Modeling of Subduction Zone Dynamics and Thermal Structure*, University of Michigan, October 4-6, 2002.
- Invited Participant – Conference on Computational Geodynamics, Lake Tahoe, California, July 26-27, 2002.
- Invited Lecture – *Sudden Plate Reorganizations in a 3D Convection Model with Plates*, Institute of Geophysics and Planetary Physics, University of California, San Diego, March, 4, 2002.
- Participant – *Mercury: Space Environment, Surface, and Interior*, Chicago, IL, October 4-5, 2001.

- Participant – *Symposium on the Icelandic Plume and Crust*, Reykjanes Peninsula Iceland, September 8-10, 2001.
- Invited Lecture – *Subducted Slabs: Dip, Slip, and Drip*, Indiana University, September 25, 2000.
- Invited Lecture – *Subducted Slabs: Dip, Slip, and Drip*, Turner Lecture, University of Michigan, January 14, 2000.
- Invited Lecture – *Subduction and Geodynamic Models, A Review: Processes and Consequences of Deep Subduction*, Verbania, Italy, September, 1999.
- Invited Lecture – *The Influence of Rheology, Phase Changes and Equation of State on Subduction*, 8th Annual V.M. Goldschmidt Conference, Toulouse, France, September, 1998.
- Invited Lecture - *Geoid and Topography Over Subduction Zones: Observations and Convection Models*, Geodynamics Branch, Goddard Space Flight Center, January 23, 1998.
- Participant - MIT-Harvard Workshop on Continental Roots, Cambridge, MA, October 10-13, 1997.
- Invited Participant - *Workshop on Numerical Modeling of Mantle Convection and Lithospheric Dynamics*, Naurod, Germany, August 1997.
- Invited Talk - King, S.D., and J. Chen, Numerical Investigations of the Dynamics of Deep Subduction: How Important Are Second-Order Effects? European Union of Geosciences, Strasbourg, France, March 23-27, 1997.
- Invited Lecture - Discovery Lecture - *The Inner Core*, Department of Earth and Atmospheric Sciences, Purdue University, September 10, 1996.
- Delegate - The Fifth SEDI Symposium on Earth's Deep Interior, Brisbane, Australia, July 22-26, 1996.
- Invited Participant - *2nd Annual German-American Frontiers of Science Symposium*, German American Academic Council, Woods Hole, June 2-4, 1996.
- Invited Lecturer - *What We Think We Know About Subduction Zones*, University of Illinois at Chicago, Department Seminar, February 15, 1996.
- Invited Participant - *Workshop on Numerical Modelling of Mantle Convection and Lithospheric Dynamics*, Vlieland, The Netherlands, September 16-19, 1995.
- Invited Participant - *Plume 2*, Schloss Ringberg, Tegernsee, Bavaria, Germany, July 16-21, 1995.
- Invited Lecturer - *Modeling Subduction Zones*, IGPP, Scripps Institute of Oceanography, Geophysics Seminar, March 10, 1995.
- Invited Lecturer - *Subduction Zones and Mantle Flow*, IUPUI, Department of Geological Sciences, Departmental Seminar, February 23, 1995.
- Invited Lecturer - *Mantle Viscosity, Seismic Tomography, and the Geoid: Testing Some Common Assumptions*, Northwestern University, Department of Geological Sciences, Departmental Seminar, November 4, 1994.
- Participant - NASA/CSEDI Conference on Deep Earth and Planetary Volatiles, Caltech, Pasadena, CA, September 21-24, 1994.
- Invited Lecturer - *Heat Transfer on a Global Scale*, Purdue University Mechanical Engineering Heat Transfer Seminar Series, September 15, 1994.

Delegate - The Fourth SEDI Symposium on Earth's Deep Interior, Whistler Mountain, British Columbia, Canada, August 7-12, 1994.

Invited Participant - Workshop on High Performance Computing in Geosciences, Boulder, CO, July 20-22, 1994.

Invited Participant - Cooperative Studies in Earth's Deep Interior Workshop on the Mechanisms of Deep Focus Earthquakes, Lake Arrowhead, CA, February 6-8, 1994.

Invited Participant - AGU Chapman Conference on Double Diffusive Convection, Scottsdale, AZ, November 3-6, 1993.

Invited Participant - Cooperative Studies in Earth's Deep Interior Workshop, Santa Fe, NM, October 22-23, 1993.

Invited Lecturer - *Mantle Dynamics and the Application of Genetic Algorithms to Mantle Viscosity Structure*, University of Minnesota Supercomputer Institute, September 29, 1993.

Invited Lecturer - *The Viscosity of the Mantle: Testing Some Common Assumptions*, University of Illinois Geology Colloquium, September 10, 1993.

Invited Participant - Workshop on Global Geodynamics, Pistina, Bohemia, Czech Republic, July 28-31, 1993.

Invited Participant - Workshop on Physical and Numerical Modeling of Mantle Convection and Lithospheric Dynamics, Oléron, France, June 20-26, 1993.

Invited Lecturer - *Mantle Viscosity, Seismic Tomography and the Geoid: Testing Some Common Assumptions*, University of Chicago, April 9, 1993.

Invited Participant - Workshop on Mantle Convection Infrastructure Proposal, Los Alamos National Laboratory, March 19-20, 1993.

Invited Participant - Mantle Convection Workshop, Los Alamos National Laboratory, 1987-1994.

Invited Participant - Cooperative Studies in Earth's Deep Interior Workshop, Cambridge, MA, Sept. 1992.

Invited Lecturer - *Mantle Viscosity, Seismic Tomography and the Geoid: Testing Some Common Assumptions*, University of Michigan, Fall, 1992.

Invited Participant - Conference on Numerical Modeling of the Lithosphere and Mantle, Wielburg, Germany, August 4-9, 1991.

Invited Participant - Caltech Plume Symposium, Pasadena, CA, May 2-4, 1991.

ABSTRACTS:

King S. D., M. C. Chapman, M. D. Long, The Curious Case of Bermuda Rise: The Last Phase of the Rift-Drift Transition?, *EOS Trans. AGU, 90(22)*, Fall Meeting Suppl., Abstract T24D-01, 2009 *Invited*.

King S. D., J. P. Lowman, L. Flesch, E. Calais, Changing Plate Motions: Is the Mantle an Active or Passive Accomplice? *EOS Trans. AGU, 90(22)*, Fall Meeting Suppl., Abstract T51A-1498, 2009 *Invited*.

Lowman J. P., C. Stein, S. Trim, S. D. King, Investigating the Influence of Plate Boundary Motion on Mantle Thermal Evolution Using 3D Convection Models, *EOS Trans. AGU, 90(22)*, Fall Meeting Suppl., Abstract DI41A-1783, 2009.

- Sekhar P. and S. D. King, Comparing 2D Axisymmetric and 3D Spherical Models of Martian Mantle Convection Constrained by Melting History, *EOS Trans. AGU*, 90(22), Fall Meeting Suppl., Abstract P31A-1240, 2009.
- Lee, C. and S. D. King, Why are High Mg# Andesites Dominantly Erupted in the Western Aleutians?; A Numerical Model Approach, *EOS Trans. AGU*, 90(22), Fall Meeting Suppl., Abstract V31B-1964, 2009.
- Lowman J. P., C. Stein, S. Trim, S. D. King (2009) The Influence of Evolving Plate Boundaries in 3D Mantle Convection Simulations, 11th International Workshop on Modeling of Mantle Convection and Lithospheric Dynamics, Brunwald, Switzerland, July 2, 2009.
- King, S. D., Tharsis Rise and the Hemispheric Dichotomy on Mars: Numerical Results, 11th International Workshop on Modeling of Mantle Convection and Lithospheric Dynamics, Brunwald, Switzerland, June 29, 2009.
- Lee, C. and S. D. King, Relationship between variations in spreading rate of the Pacific plate and time-dependent subducting slab dynamics, 11th International Workshop on Modeling of Mantle Convection and Lithospheric Dynamics, Brunwald, Switzerland, June 29, 2009.
- Lowman J. P., C. Stein, S. Trim, S. D. King (2009) The Influence of Evolving Plate Boundaries in 3D Mantle Convection Simulations, *EOS Trans. AGU*, 90(22), Joint Assembly Suppl., Abstract D111A-03
- King S.D., Mars Mantle Structure: Results from Calculations with an Imposed Hemispheric Lithospheric Step, Lunar Planetary Science Conference XL, March 2009
- Chapman, M.C. and S. D. King, Upper Mantle Structure Beneath the Southeastern United States from Receiver Functions: Evidence for Small-scale Mantle Convection? *EOS Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract S43A-1878, 2008.
- King, S.D. C. Lee, W. Leng, S. Zhong, P. E. van Keken, P. E., E. Tan, M. Gurnis, N. Tosi, A Community Benchmark for 2D Cartesian Compressible Convection *EOS Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract D131A-1772, 2008.
- Lee, C., Y. Zhou, and S. D. King, Upper Mantle Anisotropy Under Fast Spreading Mid-ocean Ridges: 2-D Whole Mantle Convection Model With Subduction *EOS Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract D113A-1677, 2008.
- King, S.D., More Thoughts on Edge Driven Convection and Continental Margin Dynamics, 33rd International Geological Congress, Oslo, Norway, August 13, 2008.
- King, S.D., Mobile Plates and work: Convection models with geophysical constraints, 33rd International Geological Congress, Oslo, Norway, August 11, 2008.
- King, S.D., On Separating Mantle and Crustal Contributions to Mars Gravity and Topography, Lunar Planetary Science Conference XXXIX, March 2008.
- Lee, C. and S. D. King, The Role of Viscous Dissipation on the Thermal Structure of Subduction Zones, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract T54B-07, 2007.
- Flesch, L. M., S. D. King, E. Calais, M. Hoesly, Thinking deeply: Is there a contribution to Asian tectonics from large-scale mantle flow? *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract T21B-0581, 2007.
- King, S. D., Quantifying the Flux of Slab Material Through the Transition Zone and Beyond, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract U11B-08, 2007.

King, S. D., A Possible Connection Between Convection in Mercury's Mantle and the Formation of Lobate Scarps, Lunar Planetary Science Conference XXXVIII, March 2007.

(approximately 90 additional abstracts from 1987-2006)

PREVIOUS AND CURRENT RESEARCH GRANTS (Externally Funded):

CSEDI Research: Dynamics of subducted slabs in the transition zone: Compressible convection with self-consistent equation of state, National Science Foundation, \$253,720, PI: S.D. King, Co-I: R. Angel, October 2009-September 2012.

Evaluating the Trench Parallel Flow Hypothesis with Numerical Models of Convection, National Science Foundation, Geophysics Panel, \$250,254, PI: S.D. King, January 2009-December 2011.

Crust and Mantle Contributions to Mars Global Topography and Gravity NASA, \$247,265, PI S. D. King, July 2007-June 2010.

Collaborative Research: Quantifying the Dynamics of Asia Using GPS, Geologic and Shear-Wave Splitting Data, and Large-Scale Flow Models, National Science Foundation, \$165,443, PI L. Flesch, Co-PI S.D. King, E. Calais, September 2006-August 2008.

CMG Training: Summer School in Geophysical Porous Flow: Multidisciplinary Teams from Nanoscale Clay to Magma Migration, National Science Foundation, \$200,000, PI J. Cushman, Co-PI S.D. King, L. Pyrak-Nolte, August 2004-July 2006.

Dynamic Subduction Zone Thermal Modeling, National Science Foundation, \$204,000, PI S.D. King, August 2004-July 2007.

Acquisition of a Cluster Computer for Geodynamics Research, National Science Foundation, \$128,000 (includes 30% Purdue matching funds), PI S.D. King, October 2003-October 2005.

Mantle Convection on Mars and the Connection with Surface Features: The Crustal Dichotomy and Tharsis Rise, NASA, \$201,000, PI S.D. King, July 2003-June 2006.

Plate Motions in 3D Cartesian Convection: The Role of Internal Heating and Plate Reorganization, National Science Foundation, \$144,712, PI S.D. King, July 2002-June 2004.

Interdisciplinary Fellowship Program for Computational Science & Engineering (CS&E), Department of Education, \$345,000, Co-PI with T.J. Downar, R. Eigenmann, A. Lyrintzis, J. Mathur, August 2001-July 2004.

A Fellowship Program for Computational Earth Sciences, Department of Education, \$380,000, PI S.D. King, Co-PIs Harshvardhan, L.W. Braile, J.M. Harbor, C.A. Clayson, August 2000-August 2003.

Subduction Zone History and Dynamics from Viscous Fluid Calculations with Non-Newtonian Rheology and Phase, National Science Foundation, \$116,000, PI S.D. King, September 1999-August 2001.

Upgrading (and Expanding) the Geophysics Computer Network at Purdue, Instrument and Facilities, NSF, \$150,000 (includes 50% Purdue matching funds), PI S.D. King, Co-PI's L.W. Braile, D.E. Granger, J.M. Harbor, A.M. Johnson, R.O. Sack, T.M. Tharp, January 1998-December 2000.

The Characterization of Subsurface Sediments in a Wetland Environment to Understand the Link Between Surface and Groundwater, The Showalter Trust, \$50,000, PI S.D. King, July 1997-July 1998.

Thrust Faults, Phase Changes, and Subduction, NSF Earth Science - Theoretical and Experimental Geophysics, \$90,000, PI S.D. King, September 1996-August 1998.

Geophysical Characterization of Some Terraces and the Geophysical Modeling of Candidate Suture Zones, Office of Mission to Planet Earth, NASA, \$300,000 (Purdue Budget \$90,000), PI R. Langel, Co-PI D. Ravat and S.D. King, January 1996-January 1999.

A Thermodynamically Self-Consistent Examination of Phase Changes and Dynamic Mantle Layering in a Temperature-Dependent, Compressible Fluid, NSF Earth Science - Theoretical and Experimental Geophysics, \$120,000, PI S.D. King, April 1994-March 1996.

Workshop on Mantle Convection Infrastructure Proposal, NSF Earth Science - Cooperative Studies in Earth's Deep Interior, \$11,000, PI L.H. Kellogg, Co-PI S.D. King and C. Gable, March 1993.

Summer Fellowship, Argonne National Laboratory, \$10,000, June 1993-August 1993.

Thrust Faults, Subduction Zones, and Global Mantle Flow, NSF Earth Science - Theoretical and Experimental Geophysics, \$80,000, PI S.D. King, May 1993-October 1995.

Upgrading the Geophysics Computer Network at Purdue, NSF Earth Science - Instrumentation and Facilities, \$130,000 (includes 50% Purdue matching funds), PI S.D. King with Co-PI's L. Braile, W. Hinze, and R. Nowack, July 1992-January 1995.

Joint Seismic and Geodynamic Inversion for Whole Mantle Structure, NSF Earth Science - Theoretical and Experimental Geophysics, \$100,000 (at Scripps Inst. of Oceanography) Co-PI with G. Masters, J. Phipps Morgan, and P. Shearer, January 1992-January 1994. (I wrote about half of the proposal.)

UNIVERSITY COMMITTEE ACTIVITIES:

Active:

- Geoscience Curriculum Committee (2007-2008)
- Geoscience Five-Year Review Committee (2007-2008)
- Geoscience Executive and Personnel Committee (2007-2009)
- Geoscience Strategic Planning Committee (2008-)
- Geoscience Strategic Building Management Committee (2008-)
- Geoscience Mentoring Committee (2009-)
- Research Computing User Advisory Committee (2007-)

PUBLIC SERVICE:

NASA Mars Data Analysis Panel (MDAP) Geophysics Panel Chair, 2008.

NSF Terra Grid Resource Allocation Committee member, 2008-2010.

Co-convener, Workshop on Numerical Modeling of Lithospheric Dynamics and Mantle Convection, UC Davis, July 9-11, 2008.

Secretary, Tectonophysics Section, AGU, 2008-2010.

External Review Committee (CERIES, Univ. Colorado, Boulder), 2006.

Senior Editor, Earth & Planetary Science Letters, 2000-2007.

Special Session Organizer, Union Session on *Beyond Plate Tectonics* at Fall AGU, San Francisco, 2005.

Special Session Organizer, Tectonophysics Session on *Modeling of Subduction Zone Dynamics and Thermal Structure* at joint EGS-AGU-EUG Assembly, Nice France, 2003.

Co-organizer, *MARGINS Workshop on the Modeling of Subduction Zone Dynamics and Thermal Structure*, University of Michigan, October 4-6, 2002.

AGU Spring Meeting/Joint Assembly, Program Chairman, 2001-2004.

AGU Fall Meeting Tectonophysics Program Chairman, 1995.

Co-organizer, Workshop on *Numerical Modeling of Mantle Convection and Lithospheric Dynamics*, Vlieland, The Netherlands, September 16-19, 1995.

Special Session Organizer, Union Session on *Computational Advances in the Geosciences* at Spring, AGU, 1995

Associate Editor, JGR-Solid Earth, 1995-1997.

Special Session Organizer, *High Performance Computing and Solid Earth Dynamics and Structure* at the Third SIAM Conference on Mathematical and Computational Issues in the Geosciences, Feb. 8-10, 1995.

Special Session Organizer, Union Session on *Genetic Algorithms* at Spring AGU, 1994.

Special Session Co-Organizer, Tectonophysics Session on *High Performance Computing*, Spring AGU, 1994.

AGU Spring Meeting Tectonophysics Program Co-Chairman, 1994-1995.

Guest Associate Editor, JGR-Solid Earth for special Transition Zone Section.

Co-convenor, Workshop on Mantle Convection Infrastructure Proposal Planning Meeting, Los Alamos, NM, March 19-20, 1993.

CURRENT GRADUATE STUDENTS AND POST-DOCS

Chengyoel Lee (Ph.D.)

Pavithra Sekhar (Ph.D.)

Don Koglin Jr. (Ph.D. – co-advising with Lucy Flesch)

Karina Chung (M.S.)

Tannistha Maiti (Ph.D.)

GRADUATED STUDENTS AND POST-DOCS

Joel Ita (Post-Doc) – 1995

Hyung Rae Kim (M.S.) – August 1997

Carmen Lowrey (M.S.) – May 1998

Muhammad Soofi (Ph.D.) – August 2001

Hannah Redmond (Ph.D.) – May 2006