

AUDREY DEAN HUERTA

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Department of Geosciences
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APPOINTMENTS

Associate Research Faculty: 2003-present Pennsylvania State Univ.
Post Doctoral Researcher: 2000-2002 University of Alabama
Visiting Faculty: 1998-1999 Deep Springs College, CA; Univ. of North Carolina
Visiting Faculty: 1997-1998 University of Wisconsin-Madison
Graduate Research Assistant: 1990-1998 MIT, Idaho State University

EDUCATION

Massachusetts Institute of Technology Ph.D. Geology, 1999
Idaho State University M.S. Geology, 1992
University of Utah B.Sc. Mechanical Engineering, 1984

RESEARCH INTERESTS

Dynamics of mountain building, focusing on interrelations between surficial, thermal, and deformational processes. Design and development of numerical models to assess the relative importance of fundamental processes and conditions. Design and implementation of field-based projects to provide constraints on models.

RESEARCH FUNDING

Collaborative Research—Byrd Outlet: Geomorphic, geochronologic and geodynamic evidence of collapse of the West Antarctic Plateau
NSF , **Recommended for funding by program manager** \$175,509, **A.D. Huerta, PI**
IPY: POLENET-Antarctica: Investigating Links between Geodynamics and Ice Sheets
NSF **Funded:** expires 06/2013 \$671,888, **A.D. Huerta, Co-PI**
Application of GIS in quantifying glacial impact on mountainous terrain
PSU-GIS council **Funded:** expires 10/08 \$5000 **A.D. Huerta, PI**
Artificial Neural Networks: a new landscape characterization toolbox
NSF **Funded:** expired 6/31/07 \$75,509, **A.D. Huerta, PI**
Uplift and exhumation of the Transantarctic Mtns and relation to rifting in West Antarctica
NSF **Funded:** expired 5/29/06 \$188,000, **A.D. Huerta, Co-PI**
Acquisition of Geophysical Field Equipment for Earth Science Research and Teaching
NSF **Funded:** expired 7/31/04 \$170,000. **A.D. Huerta, Co-PI**

OUTREACH AND ADVISING

Assistant Director; Forays into the Field, Idaho State Univ, 1999–present
Design and deliver one-week science curriculum and activities. Based on-campus, joining both young women that are adverse to and enjoy science.
Faculty Advisor; Student Research Opportunity Program (SROP), Penn State 2006–present
Recruit and mentor undergraduates from under-represented groups for 8-week intensive research environment. Final projects presented by students at national conference.
Adopt a Scientist; Proctor Elementary, Topsfield, Massachusetts 2007–present
Interact with 5th graders, discuss Antarctic Environment, Geology, and Glaciology.

COURSES DEVELOPED

- A Field-based Introduction to Geology*, Deep Springs College:—This course introduced liberal arts students to the fundamentals of Physical Geology through weekly field trips and hands-on field projects.
- Africa Rocks*, Pennsylvania State University: A blended web- and lecture-based course focusing on the Seismology of Africa to understand fundamental Physical Geology. Developed in collaboration with Drs. Nyblade and Taylor. To be made publicly available.
- Introduction to Applied Geophysics*, Pennsylvania State University: Eight week course for physics undergraduates focusing on shallow geophysics. Field work in Bushveld Complex, South Africa in collaboration with Dr Nyblade of PSU and Sue Webb of University of Witwatersrand.

COURSES TAUGHT***Introductory Courses***

Introduction to Physical Geology
 Introduction to Environmental Geology
 Introduction to Oceanography
 Introduction to Applied Geophysics
 Introduction to Physics with Calculus

Upper Level/Graduate Courses

Structural Geology
 Geologic Field Methods
 Geophysical Field Methods

FIELD EXPERIENCE

Summary: Field-based research in a variety of rock types and tectonic settings in the U.S., Europe, Asia, Africa, and Antarctica.

Cryosphere studies: Siple Coast, West Antarctica

Geophysics studies: Transantarctic Mts, Antarctica; West Antarctica; Bushveld Complex, South Africa

Structural studies: Boulder Mts., Idaho; Shadow Mts., California;

Thermochronology studies: Albion Mts., ID; Himalaya, Nepal

Sedimentary studies: Rockland Valley, ID; Catalonia, Spain; Resting Springs Range, CA

Igneous studies: Sierra Nevada, CA; Organ Mts., NM.

PROFESSIONAL SERVICE

Journal referee for Geology, Geomorphology, Tectonophysics, Earth and Planetary Science Letters, Physics of the Earth and Planetary Interiors, Journal of Metamorphic Geology

Peer reviewer for ESF Eurocores program, and NSF Antarctic Earth Science, Tectonics, Geomorphology and Landscape Dynamics, PIRE, and MRI programs

Representative, College of Earth and Min. Sciences Research Faculty Council, 2003–present

Co-President, “Models of Lithospheric Deformation” session, Margins RCL workshop 2006

Member, Dept. of Geosciences Research Faculty Promotion Policy Committee 2005

Member, Dept. of Geosciences Outreach Coordinator Search Committee 2005

Invited Participant, CIG Geodynamic Modeling of Tectonic Processes workshop 2005

Panelist, NSF Office of Polar Programs, Antarctic Geology and Geophysics 2004

Graduate Faculty University of Alabama 2002

Co-President “Collisional Tectonics of Asia” session, Fall AGU 1995

INVITED TALKS

Arizona State University	2007	University of Alabama	2000
Lamont-Doherty Earth Observatory	2005	University of South Carolina	2000
Bucknell University	2005	University College Dublin, Ireland	1999
DiffPack Inc., Oslo Norway	2004	Boise State University	1998
Pennsylvania State University	2003		
Indiana University of Pennsylvania	2002		

AWARDS AND HONORS

<i>Scientific Committee on Antarctic Research</i> : Travel Award, Bremen, Germany	2004
<i>World University Network</i> : Research Fellowship	2004
<i>Geotimes</i> : Significant Contribution to Petrology	1997
<i>Massachusetts Institute of Technology</i> : Presentation Funding	1996, 1995, 1993
<i>Massachusetts Institute of Technology</i> : Graduate Fellowship	1992–1994
<i>Caltech</i> : Continental Oil Fellowship	declined
<i>Columbia University</i> , Faculty Fellow	declined
<i>Geological Society of America</i> , Graduate Research Grant	1991
SIGMA XI, Graduate Research Grant	1991
<i>Nat'l Assoc. of Geology Teachers</i> : Scholarship	1990
<i>Idaho State University</i> : Scholarship	1989–1990
<i>Graduate Council, Idaho State University</i> , Graduate Research Grant	1989

REFEREED PUBLICATIONS

- Huerta, A.D.**, *In preparation*, Coupled Evolution of the Transantarctic Mountains and the East Antarctic Ice Sheet: Insights from Landscape Analysis: *JGR-Earth Surface Processes*.
- Huerta, A.D.**, Nyblade, A. and Reusch, A.M., *submitted*, Evidence of thermally disturbed mantle beneath the East African Rift, Kenya *Geophysical Research Letters*
- Huerta, A.D.**, 2007, Lithospheric Structure across the Transantarctic Mountains constrained by analysis of gravity and thermal structure: *In: Antarctica: A Keystone in a Changing World*. Cooper, A., and C. Raymond, eds. U.S.G.S. Open-File Report 2007-1047.
- Huerta, A.D.** and Harry, D.L., 2007, The Transition from Diffuse to Focused Extension: Modeled Evolution of the West Antarctic Rift System: *Earth and Planetary Science Letters*, v. 255: p 133-147.
- Moret, G.J.M. and **Huerta, A.D.**, 2007, *Short Note*: Correcting GIS-Based Slope Aspect Calculations for the Polar Regions: *Antarctic Science*, v. 19: p. 129-130
- Huerta, A.D.**, and Rodgers, D.W., 2006, Constraining Rates of Thrusting and Erosion: Insights from Kinematic Thermal Modeling: *Geology*, v. 34
- Harry, D.L, Londono, J., **Huerta, A.D.**, 2003, Early Paleozoic transform-margin structure beneath the Mississippi coastal plain, southeast United States: *Geology*, v. 31: p. 969-972.
- Huerta, A.D.**, Royden, L.H., Hodges, K.V., 1999, The effects of accretion, erosion, and radiogenic heat on the metamorphic evolution of collisional orogens: *J. of Metamorphic Geology*, v. 17(4): p.349-366.
- Huerta, A.D.**, Royden, L.H., Hodges, K.V., 1998, The complex thermal structures of collisional orogens as a natural response to accretion and surface erosion: *J. Geophys. Research*, v. 103: p. 15,287-15,302.
- Huerta, A.D.**, 1998, The Thermal and Metamorphic Evolution of Mountain Belts as a Response to Erosion, Accretion, and Radiogenic Heating. *Ph.D. Dissertation, Massachusetts Institute of Technology*
- Huerta, A.D.**, Royden, L.H., Hodges, K.V., 1996, The Interdependence of Deformational and Thermal Processes in Mountain Belts: *Science*, v. 273: p. 637-639.
- Huerta, A.D.**, and Rodgers, D.W., 1996, Kinematic and Dynamic Analysis of a low-angle strike-slip fault: The Lake Creek fault of south-central Idaho: *J. of Structural Geology*, v. 18: p. 585-593.
- Huerta, A.D.**, 1996, Lake Creek Fault: evidence of pre-Challis shear within south-central Idaho. *M.S. Thesis, Idaho State University*.
- Rodgers, D.W., Link, P.K., **Huerta, A.D.**, 1995, Structural framework of mineral deposits hosted by Paleozoic rocks in the northeastern part of the Hailey 1°x2° Quadrangle, south-central Idaho. In: *Geology and Mineral Resources of the Hailey and Western Idaho Falls 1°x2° Quadrangles, ID*. Worl, R.G., Link, P.K., Winkler, G.R. and Johnson, K.M., eds. U.S.G.S. Bull 2064, p. B1-B18.

SELECTED ABSTRACTS

- Huerta, A.D.** 2008, Evidence of a Mesozoic West Antarctic Plateau: Scientific Committee on Antarctic Research Biennial Open Science Conference
- Huerta, A.D.**, Winberry, J.P. 2007, Slow erosion by a fast glacier: AGU, Eos, Transactions
- Huerta, A.D.**, 2007, Geochronologic, geomorphic, and geodynamic evidence for a Mesozoic West Antarctic Plateau: Proceedings from the 10th International Symposium on Antarctic Earth Science
- Huerta, A.D.**, Nyblade, A., Larson, M. 2006, Mantle transition zone structure beneath Kenya, East Africa: AGU, Eos, Transactions
- Huerta, A.D.**, 2006, Coupled evolution of mountains and ice sheets; faults, fjords, and fluvial systems: International Glaciological Society, International Symposium on Cryospheric Indicators of Global Climate Change
- Huerta, A.D.**, 2006, Crustal Heat Production and Rifting Evolution: Margins workshop, Gulf of California, Rifting Continental Lithosphere
- Huerta, A.D., Reusch, D.B.**, 2005, Quantitative Analysis of Glaciated Landscapes: AGU, Eos, Transactions
- Rodgers, D. W. **Huerta, A.D.**, 2005, Thermal Evolution of a Simple Thrust Sheet; Two-dimensional Modeling and Application to Thrust Kinematics: AGU, Eos, Transactions
- Huerta, A.D.** and Harry, D.L., 2004, Evolution Of The West Antarctic Rift System And The Importance Of Lateral Heat Conduction: AGU, Eos, Transactions
- Mardal, K.A. **Huerta, A.D.** Langtangen, H.P., Harry, D.L., 2003, Numerical Modeling of Crust and Mantle Movement, Seventh SIAM Conference on Mathematical and Computational Issues in the Geosciences
- Huerta, A.D.**, Hodges, K.V., Royden, L.H., 1999, Interrelationship between deformational, surficial, and thermal processes; an example from the Himalaya: Geological Society of America Abstracts with Programs, v. 31, no. 4, pp. 17.
- Huerta, A.D.**, Royden, L.H., 1995, Thermal Evolution of Collisional Orogens: Effects of Accretion and Erosion: Eos, Transactions, v. 76, no 46, p. F567.
- Huerta, A.D.**, 1992, Dextral-Normal faulting as an early phase of Eocene extension, south-central Idaho: Geological Society of America Abstracts with Programs, v. 24, no. 6, p. 19.
- Rodgers, D.W., Ore, H.T., Bobo, R., Henderson, E., and **Huerta, A.D.**, 1991, Neogene sedimentation patterns and drainage reversal in southern Idaho: evidence for migration of the Yellowstone hot spot: Geological Society of America Abstracts with Programs, v. 23, no. 4, p. 88.
- Huerta, A.D.**, Lovejoy, F, and Link, P.K., 1991, Anomalous Mississippian(?) Conglomerates near Summit Creek, northern Boulder Mountains, south-central Idaho: Geological Society of America Abstracts with Programs, v. 23, no. 4, p. 34.