

Department of Geology • Bryn Mawr College •
101 North Merion Avenue • Bryn Mawr, PA 19010-2899 U.S.A •
Tel. (610) 526-5113 • Fax. (610) 526-5086 • Email: aweil@brynmawr.edu

Arlo Brandon Weil

Education

B.S., Geology, University of Oregon	1993
M.S., Geology, University of Michigan	1997
Ph.D., Geology, University of Michigan	2001

Professional Experience

The University of Oregon

- Worked with Columbia University and the University of Oregon on the Colorado Seismic Array 1992
- Research assistant for Dr. Ray Weldon
Geology Department, University of Oregon 1992, 1993

US Geologic Survey

- Research Scientist and field geologist (surface water hydrology) 1994

The University of Michigan

- Graduate Research Assistant 1995 - 2001
- Graduate Teaching Assistant 1995 - 2001
- Geology Field-Camp Instructor 1997, 1998
- Paleomagnetic Laboratory manager 1997 - 2001

Bryn Mawr College

- Assistant Professor of structural geology/tectonics 2001 - 2007
- Associate Professor 2007 – present
 - Department Chair 2008 – present

General Research Interests

Tectonics of fold-and-thrust belts, paleomagnetism applied to tectonic problems, kinematics of curved mountain belts, Variscan Europe, Precambrian paleogeography and tectonics, and the evolution and lifecycle of supercontinents.

Awards/ Grants

- Outstanding Student Paper (Geomagnetism/Paleomagnetism Section) – Spring AGU 2000
- Outstanding Student Paper (Tectonophysics Section) – Fall AGU 2001
- NSF Academic Intern Fellowship
- University of Michigan - F. Scott Turner Fellowship (1996-1999)
- IRM Visiting Research Fellowship 1999 and 2002
- Bryn Mawr College Faculty Grant 2002, 2004, 2006, 2009
- NSF Research Grant 2004 – *Three-Dimensional kinematic history of the Wyoming Salient: Implications for the development of curved orogens* (\$136,466.00)
- NSF Equipment Grant 2004 - *Acquisition of new paleomagnetic lab equipment for Bryn Mawr College, Pennsylvania* (\$114,446.90)
- NSF Research Grant 2004 – *Determining the 3D kinematic evolution of the Wyoming Laramide, implications for processes of foreland deformation* (\$127,332.00)
- UNESCO Project Grant – IGCP 574 - *Bending and Bent Orogens, and Continental Ribbons*

Professional Societies

American Geophysical Union; Geological Society of America; Geological Society of Pennsylvania; Geologic Society of Philadelphia; Sigma XI Academic Society; European Geophysical Society

Graduate Advisors: Dr. Rob Van der Voo and Dr. Ben A. van der Pluijm (both at *The University of Michigan*)

Peer Reviewed Publications:

1998

Weil, A.B., Van der Voo, Mac Niocaill, C., and Meert, G.M., 1998. The Proterozoic supercontinent Rodinia: Paleomagnetically derived reconstructions for the 1,100 to 800 Ma interval, *Earth Planet Sci. Lett.*, 154, 13-24.

2000

Karlstrom, Karl E., Bowring, S. A., Dehler, C.M., Knoll, A.H., Porter, S. M., Sharp, Z., Des Marais, D. J., **Weil, A.B.**, Geissman, J. W., Elrick, M., Timmons, M. J., Keefe, K. and Crossey, L. J., 2000. The Chuar Group of the Grand Canyon: Record of break up of Rodinia, associated change in the global carbon cycle, and eukaryotic diversification by 740 Ma, *Geology*, 28, 619-622.

Parés, J.M., Perez-Gonzalez, A., **Weil, A.B.** and Arsuaga, J.L., 2000. On the Age of the Hominid Fossils at the Sima de los Huesos, Sierra de Atapuerca, Spain: Paleomagnetic Evidence, *American Journal of Physical Anthropology*, 111, 451-461.

Weil, A.B., Van der Voo, R., van der Pluijm, B. and Parés, J.M., 2000. The Formation of an orocline by multiphased deformation: a paleomagnetic investigation of the Cantabria-Asturias Arc Hinge-Zone (northern Spain), *Journal of Structural Geology*, 22, 735-756.

2001

Weil, A.B., Van der Voo, R. and van der Pluijm, B. New paleomagnetic data from the southern Cantabria-Asturias Arc, northern Spain: Implications for true oroclinal rotation and the final amalgamation of Pangea, *Geology*, 29, 991-994, 2001.

2002

Weil, A.B. and Van der Voo, R., 2002 Insights into the mechanism for orogen related carbonate remagnetization from growth of authigenic Fe-oxide: A SEM and rock magnetic study of Devonian carbonates from northern, *Journal of Geophysical Research*, 107, B4.

***Weil, A.B.**, Van der Voo, R., Application of the paleomagnetic fold test to complex geologic environments: A case study from northern Spain, *Physics and Chemistry of the Earth*, 27, 1223-1235, 2002.

2003

Weil, A.B., Geissman, J., Heizler, M. and Van der Voo, R. A paleomagnetic investigation of Middle Proterozoic mafic intrusions and Upper Proterozoic redbeds from the Lower Grand Canyon Supergroup, Arizona, *Tectonophysics*, 375,199-220,2003.

2004

Gutiérrez-Alonso, G., Fernández-Suárez, J. and **Weil, A.B.**, Orocline triggered lithospheric delamination?, in: Paleomagnetic and structural analysis of orogenic curvature, *Geologic Society of America Special Paper 383*, 121-131, 2004.

Gutiérrez-Alonso, G., Fernández-Suárez, J. and **Weil, A.B.**, Oroclinales y delaminacion: relaciones y efectos, *Geo-Temas*, 6(3), 69-74, 2004

Weil, A.B. and Sussman, A., Classification of curved orogens based on the timing relationships between structural development and vertical-axis rotations, in: Paleomagnetic and structural analysis of orogenic curvature, *Geologic Society of America Special Paper 383*, 1-17, 2004.

Weil, A.B., Geissman, and Van der Voo, R. Paleomagnetism of the Neoproterozoic Chuar Group, Grand Canyon Supergroup, Arizona: Implications for Rodinia break-up and Laurentia's Neoproterozoic APWP, *Precambrian Research*, 129, 71-92, 2004.

- Sussman, A. and **Weil, A.B.** (editors), Paleomagnetic and structural analysis of orogenic curvature, *Geologic Society of America Special Paper 383*, p. 271.
- 2005**
Ashby, J.M., Geissman, J.W., and **Weil, A.B.**, Has the eastern end of the Uinta Mountains been bent?: paleomagnetic and fault kinematic analysis, in: *Geology of the Uinta Mountains*, eds., Dehler, C.M., Pederson, J.L., Sprinkel, D.A., and Kowallis, B.J., *U.G.A.*, Publication 33, 285-320, 2005.
- 2006**
Weil, A.B., Geissman, J.W., and Ashby, J.M., A new paleomagnetic pole for the Neoproterozoic Uinta Mountain Supergroup, Central Rocky Mountain States, USA, *Precambrian Research, PRECAM 2655*, 1-26, 2006.
Weil, A.B., Kinematics of orocline tightening in the core of an arc: Paleomagnetic analysis of the Ponga Unit, Cantabria Arc, northern Spain, *Tectonics*, 25, 2005TC001861,1-23, 2006.
- 2008**
Tohver, E., and **Weil, A.B.**, A new technique for dating the absolute timing of carbonate remagnetization: Ar-Ar dating of clay transformation in Paleozoic carbonates, *EPSL*, 274 524-530.
Gabriel Gutiérrez-Alonso, J. Fernández-Suárez, **A.B. Weil**, J. Brendan Murphy, R. Damian Nance, Fernando Corfú, Stephen T. Johnston, Self-subduction of the Pangean global plate, *Nature Geoscience*, 1, 549+-553.
Weil, A.B., and Yonkee, A., The power of integration: combining paleomagnetic data with structural analysis to better understand the kinematics and mechanics of complex orogens, *in press Trabajos de Geologia*.
- 2009**
Weil, A.B., and Yonkee, A., Anisotropy of Magnetic Susceptibility as a proxy for layer parallel shortening and tangential extension: implications for mountain belt curvature in the Wyoming Salient, *Lithosphere*, 1, 4, 235-256.
- 2010**
Gabriel Gutiérrez-Alonso, J. Brendan Murphy, Javier Fernández Suárez, **Arlo B Weil**, M. Piedad Franco, J. Carlos Gonzalo, Lithospheric mantle replacement in the core of Pangea: Sm-Nd insights from Iberia, *submitted to EPSL*.
Weil, A.B., Gabriel Gutiérrez-Alonso, Jordan Conan, New time constrains on lithospheric-scale oroclinal bending of the Ibero-Armorican Arc: a paleomagnetic study of earliest Permian rocks from Iberia, *Journal of the Geological Society of London*, 167, 127-173.
Weil, A.B., Yonkee, A., and Sussman, A., Reconstructing the kinematics of thrust sheet rotation: a paleomagnetic study of Triassic redbeds from the Wyoming Salient, U.S.A., *GSA Bulletin*, 122, ½ 2-23.
Yonkee, A., **Weil, A.B.**, and Sussman, A., Reconstructing the kinematic evolution of curved mountain belts: internal strain patterns in the Wyoming Salient, Sevier thrust belt, U.S.A., *GSA Bulletin*, 122, ½, 24-50.
Yonkee, A., and **Weil, A.B.**, Quantifying vertical-axis rotation in curved orogens: integrating multiple data sets with a refined weighted least-squares strike test, *Tectonics*, doi:10.1029/2008TC002312.

Selected Abstracts:

- Ashby, J.M., Geissman, J.M. and **Weil, A.B.**, 2001. Paleomagnetic results from the Neoproterozoic Uinta Mountain Group, Utah and Colorado, *Abstracts with Programs, GSA 2001 Annual Meeting*.
- Gage, J., Weil, A.W., and Pares, J., Preliminary AMS analysis of the Brevard Shear Zone, Rosman, NC, *Abstracts with Programs, GSA 2004 Annual Meeting*.
- *Gutiérrez-Alonso, G., Fernández-Suárez, J. and **Weil, A.B.**, Orocline triggered lithospheric delamination? *Field-Workshop, Variscan to Post-Variscan fluid flow and Zn-Pb Mineralisation in Europe*.

- *Van der Voo, R., **Weil, A. B.** and Zegers, T, 1999. The making of a supercontinent with paleomagnetic data, *abstract for the Aarhus meeting*.
- *Van der Voo, R., **Weil, A. B.** and Peacor, D.R., 2000. Paleomagnetism, Rock Magnetism, Mineralogy and Geochemistry of Remagnetized Carbonates: How Little Have We Learned About Models and Mechanisms for Remagnetizations, *EOS Trans.*, Fall 1999 Meeting, 80, 45, p. F298.
- *Van der Voo, R. and **Weil, A. B.**, 2001. The Fold Test in Paleomagnetism, EGS abstracts, 2001 meeting, *Annales Geophysicae*.
- ***Weil, A.B.**, Van der Voo, R., Mac Niocaill, C., and Meert, J.G., 1996. The Proterozoic Supercontinent Rodinia: a Paleomagnetic look at 1,100 to 800 Ma continental reconstructions, *EOS Trans.*, Spring 1996 Meeting, 77, p. S87.
- Weil, A.B.**, Geissman, J., Van der Voo, R. and Karlstrom, K., 1999. Preliminary paleomagnetic results from a suite of Proterozoic dikes from the Grand Canyon Supergroup, Arizona, *EOS Trans.*, Spring 1999 Meeting, 80, 17, p. S91.
- ***Weil, A.B.**, 2000. Deformation induced remagnetization of carbonates: A rock magnetic and SEM perspective, *Santa Fe V conference on Rock Magnetism*.
- Weil, A.B.**, A revised look at Laurentia's Proterozoic Apparent Polar Wander Path: Implications for paleogeography and the Rodinia supercontinent, *Abstracts with Programs, GSA 2001 Annual Meeting*.
- Weil, A.B.**, Geissman, J. and Van der Voo, R., Paleomagnetic results from the Upper Unkar Group and overlying Nankoweap Formation from the Grand Canyon Supergroup (GCSG), Arizona: Implications for Laurentia's Neoproterozoic APWP, *EOS Trans.*, Fall 2001 Meeting, 82, 47, p. F315.
- ***Weil, A. B.** and Sussman, A.J., Oroclines and other curved thrust belts: Clarification and Classification, *GSA 2002 Annual Meeting*.
- Weil, A.B.**, Gutiérrez-Alonso and G., Fernández-Suárez, J., Orocline triggered lithospheric delamination, *GSA 2003 Annual Meeting*.
- Weil, A.B.**, Deformation of Charelston Chew Candy Bars as a rheology analogue in the structural geology classroom, *GSA 2004 Annual Meeting*.
- Weil, A.B.**, Sussman, A., and Yonkee, A., Determining the 3-D kinematic history of the Wyoming salient of the Sevier fold-thrust belt: Preliminary results from a paleomagnetic investigation of the Triassic Ankareh Formation, *GSA 2005 Annual Meeting*.
- Weil, A.B.**, DID VARISCAN EUROPE BEHAVE AS AN OROCLINALLY BENT RIBBON CONTINENT DURING THE LATEST CARBONIFEROUS?, *GSA 2007 Annual Meeting*.
- ***Weil, A.B.**, The power of integration: combining paleomagnetic data with structural analysis to better understand the kinematics and mechanics of complex orogens, *AGU 2008 Spring Meeting*.
- ***Weil, A.B.**, Our state of understanding the mechanisms for carbonate remagnetization: unraveling the causes and consequences for authigenic Fe-oxide production, *AGU 2009 Spring Meeting*.
- Yonkee, A. and **Weil, A.B.**, A refined statistical approach to the paleomagnetic strike test: applications to the Wyoming salient, Sevier fold-thrust belt, *AGU 2007 Fall Meeting*.
- Yonkee, A. and **Weil, A.B.**, Three-dimensional kinematic history of the Wyoming Salient of the Sevier orogenic belt, *Backbone of Americas – Patagonia to Alaska*, 2006.

* - Invited talks/papers.

Invited Talks and Lectures

Bryn Mawr College
 Science and Society
 Science and Society
 Spanish Colloquium
Bucknell University
Colorado College
Franklin and Marshall College
Huelva University, Spain
Lafayette College
Lehigh University
Oviedo University, Spain
University of California at Santa Cruz
University of Michigan – Smith Lecture Series
University of Minnesota – Institute of Rock Magnetism
University of Salamanca, Spain
Utah State University
West Chester University

Convened Professional Meeting Sessions

- 2000** - Rock- and Paleo-Magnetism
American Geophysical Union 2000 Spring Meeting
- 2001** - Geomagnetism and Paleomagnetism
American Geophysical Union 2001 Fall Meeting
- 2002** - Topical Session - Thrust Belt Curvature: Integrating Paleomagnetic and Structural Analysis
Geological Society of America 2002 National Meeting
- 2007** - New Innovations in Rock- and Paleo-Magnetism
American Geophysical Union 2007 Fall Meeting

Professional Service

- Member of the executive committee for the Structural Geology and Tectonics division of the Geological Society of America (Best Paper Award Committee)
- Associate Editor of the *Geological Society of America Bulletin*

Refereed Publications

Tectonophysics (7 papers), EPSL (6 papers), Geofluids (2 papers), Geology (3 paper), Geophysical Journal International (6 paper), GSA Special Paper (Volume 364), GSA Bulletin (5 papers), Tectonics (6 papers), Journal of Geophysical Research (6 papers), Geophysical Research Letters (3 paper)

Teaching

Courses Taught, Bryn Mawr College (2001 – present)

- GEOL 101 How the Earth Works (Fall '01; '02; '03; '05)
- GEOL 204 Structural Geology (Spring '02; '03; '04; '06)
- GEOL 209 Natural Hazards and Human Populations (Spring '03; '04; '06)
- GEOL 304 Tectonics (Fall '03; Fall '05)
- GEOL 310 Geophysics (Fall '02; Fall '06)
- GEOL 350 Precambrian Paleomagnetism (Spring '06)
- GEOL 610 Advanced Structure (Fall '01)
- GEOL 630 Advanced Tectonics (Spring '02)

Research Project Supervision

- **Sara Toursher** - *Shear Sense Indicators, Geochemistry and Field Studies of Mylonitized Phenix City Gneiss in West Georgia*, in completion of a senior thesis (2002).
- **Amanda Rogers** - *Paleomagnetic investigation of the Uinta Mountain Supergroup: Implications for the Proterozoic Rodinia Supercontinent*, Bryn Mawr Summer Science Research Program (2002).
- **Kira Tushman** - *Formation of Curved Mountain Belts: An investigation of the Wyoming Fold-Thrust Belt*, Bryn Mawr Summer Science Research Program (2003).
- **Sara Nicole McCullough** - *Geologic Investigation of the Wyoming Fold-Thrust Belt*, Bryn Mawr Summer Science Research Program (2003).
- **Kira Tushman** - Senior Thesis Research Project on the structural geology of the Wyoming Salient, completion date: Winter 2003.
- **JoAnn Gage** - Marshall Fellowship Research Project: *Anisotropy of Magnetic Susceptibility study of the Brevard Zone, North Carolina* - Summer 2004.
- **Melissa Lindholm** - *Kinematics of the Wyoming Fold-Thrust Belt*, Bryn Mawr Summer Science Research Program (2004).
- **Andrea Cutruzzula** - *An Investigation of the Wyoming Salient: The What, When, Where, and Why of Mountain Belt Curvature*, Bryn Mawr Summer Science Research Program (2004).
- **Mathew Tomich** – *Wyoming Geology*, Bryn Mawr Summer Science Research Program (2005).
- **Evan Pugh** – *Wyoming Geology*, Bryn Mawr Summer Science Research Program (2005).
- **Anna Mazzariello** – *Permian Rotations in Iberia, a study of oroclinal bending*, Bryn Mawr Summer Science Research Program (2006).
- **Zoe Ruge** – *Wyoming Geology and Paleomagnetism*, Funded from NSF Grant (Summer 2006)
- **Alexi Ernstoff** – *Structure of the Canadian Rocky Mountains*, Bryn Mawr Summer Science Research Program (2007).
- **Jordan Conan** - *Time constraints on oroclinal bending of the Cantabria-Asturias Arc: a paleomagnetic study from northern Iberia*, in completion of a senior thesis (2008).

College Committees

- Science Laboratory Safety Committee 2001 - present
- Independent Majors Committee 2002 - 2005
- College Admissions (Chair) 2006 – 2009
- Geology Department Chair 2008 - present