

ADAM C. MALOOF

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PERSONAL INFORMATION

Born December 30, 1975, Nova Scotia, Canada
Married to Pascale M. Poussart

EDUCATION

- 1998-2004* Harvard University (Cambridge, MA)
Ph.D., Earth and Planetary Sciences, Advisor: Paul F. Hoffman
Thesis: Three non-uniformitarian changes that shaped the Neoproterozoic Earth
- 1994-1998* Carleton College (Northfield, MN)
B.A., Geology with honors, Magna Cum Laude, ΦBK, Sigma Xi, D. Stewart Fellow
Juneau Icefield Research Project (JIRP 1994), Alaska
Junior year at the University Courses on Svalbard (Spitsbergen, Norway)

PROFESSIONAL EXPERIENCE

- 2006* → Assistant Professor of Geosciences, Princeton University
- 2004-2006* Agouron Postdoctoral Fellow, Massachusetts Institute of Technology
- 1999 & 2002* Teaching Fellow, Harvard University, two *Distinction in Teaching* awards
- 1997 & 1998* Teaching Assistant (Geomorphology and Mineralogy), Carleton College
- 1997* Teaching Assistant (Seismology), University Courses in Svalbard
- 1995-1998* Teaching Assistant (Photography), Carleton College

RESEARCH INTERESTS

I am an Earth historian. Nearly all of my research relies on original field observations – at the scale of maps and at the scale of rock outcrops. Since 1997, I have spent 29 months in the field, and my research continues to focus on the generation of new field-based datasets.

In addition to collecting field data, my current work involves using sedimentary and volcanic rocks to extract information about Earth's ancient magnetic field and the relative motion of continents, perturbations to the global carbon cycle, climate change, and processes related to small meteorite impacts. By placing a suite of multidisciplinary lab results into the context of detailed field work, I aim to generate integrated datasets that tell rich stories of Earth history.

ACTIVE GRANTS

NSF EAR-0638660, Sedimentary Geology and Paleobiology: Collaborative Research: Calibrating Rates and Duration for Isotopic Variability During the Early Cambrian Radiation of Animals, Anti-Atlas Mountains, Morocco (2007-2008).

NSF EAR-0514657, Sedimentary Geology and Paleobiology: An integrated paleomagnetic, isotopic, and stratigraphic test of the inertial interchange true polar wander hypothesis, Bitter Springs Stage, Australia (2006-2007).

- 2008 Anti-Atlas Mnts, Morocco [4 weeks], Team leader A.C. Maloof
U-Pb ash calibrated multi-proxy record of Early Cambrian global change
- 2007 Okanagan Highlands, B.C. Canada [2 weeks], Team leaders A.C. Maloof and R.E. Kopp
Early Eocene climate sensitivity recorded in varved lacustrine sediments
- 2006 & 2007 Central, Australia [20 weeks], Team leader A.C. Maloof
Testing the true polar wander hypothesis for global change 800 Ma
- 2005 & 2006 Lonar, India [6 weeks], Team leaders A.C. Maloof, S.T. Stewart-Mukhopadhyay, B.P. Weiss
Bolide impact in basalt as an analog for surface processes on Mars
- 2005 Ontario, Canada [2 weeks], Team leaders A.C. Maloof
Non-dipole geomagnetic fields recorded in 1.1 Ga large igneous provinces
- 2005 Andros Island, Bahamas [6 weeks], Team leader A.C. Maloof
The origin of magnetism and parasequence architecture in platform carbonates
- 2004 Fjordland, East Greenland [4 weeks], Team leaders A.C. Maloof and P.F. Hoffman
Sedimentation under sea ice during a Neoproterozoic glaciation
- 2004 Victoria Island, Arctic Canada [4 weeks], Team leader A.C. Maloof
Coincident paleomagnetic, carbon-isotopic and sea level excursions in 800 Ma rocks
- 2001 & 2003 Mackenzie Mountains, Canada [8 weeks], Team leaders P.F. Hoffman and A.C. Maloof
Testing the snowball Earth hypothesis in the Windemere Supergroup
- 1999-2002 East Svalbard, Norway [13 weeks], Team leaders A.C. Maloof and G.P. Halverson
Sequence/chemo/magneto-stratigraphy through 250 myr of the Neoproterozoic era
- 2000-2002 Anti-Atlas Mountains, Morocco [23 weeks], Solo A.C. Maloof
Global carbon cycling during the Latest Neoproterozoic and Early Cambrian
- 2002 W. Newfoundland, Canada [3 weeks], Team leader J. Bedard
Early Ordovician oceanic crust and the oxygen-isotopic evolution of seawater
- 2001 Southern Namibia [3 weeks], Team leader A.C. Maloof
Neoproterozoic glaciation of a continental slope
- 2000 Adrar, Mauritania [2 weeks], Team leaders P.F. Hoffman and A.C. Maloof
A terrestrial Neoproterozoic glacial deposit and its cap carbonate
- 2000 Talkeetna Arc, Alaska [2 weeks], Team leader L.M. Mehl
Structural and compositional mapping of the upper mantle beneath an accreted arc
- 1999 Paradox Basin, SE Utah [2 weeks], Team leader D.L. Barbeau
Evolution of a Pennsylvanian-Permian flexural basin beside a basement cored uplift
- 1998 E. Newfoundland, Canada [2 weeks], Team leaders A.C. Maloof and G.P. Halverson
Sedimentologic and detrital zircon study of the Late Neoproterozoic Gaskiers Fm diamictite
- 1998 E. Greenland [8 weeks], Team leaders A. Andresen and E.H. Hartz
Structure of the Fjord Region Detachment and deposition of Devonian old red sandstone
- 1998 Northern Norway [2 weeks], Team leader Jack Kohler
Basal sliding and subglacial hydrology of Svartisen glacier
- 1998 Anti-Atlas Mountains, Morocco [4 weeks], Team leader J.L. Kirschvink
Magnetostratigraphy of Early Cambrian carbonates and lava flows
- 1997 Northern Namibia [10 weeks], Team leader P.F. Hoffman
Subject of undergraduate thesis: Otavi Group stratigraphy and Pan African deformation
- 1997 W. Spitsbergen, Norway [3 weeks], Team leader A.C. Maloof
Genesis and time-evolution of an arctic valley pingo field

- Maloof, A.C.**, Kopp, R.E., Grotzinger, J.P., Fike, D., Bosak, T., Vali, H., Weiss, B.P. and Kirschvink, J.L. 2007, Sedimentary iron cycling and the origin and preservation of magnetization in platform carbonate muds, Andros Island, Bahamas; *EPSL*, 259 pp. 581-598.
- Halverson, G.P., **Maloof, A.C.**, Schrag, D.P., Dudas, F.Ö. and Hurtgen, M.T. 2007, Stratigraphy and geochemistry of a ca 800 Ma negative carbon isotope interval in northeastern Svalbard; *Chemical Geology*, 237 pp. 5-27.
- Kopp, R.E., Weiss, B.P., **Maloof, A.C.**, Vali, H., Nash, C.Z., and Kirschvink, J.L. 2006, Chains, clumps, and strings: Magnetofossil taphonomy with ferromagnetic resonance spectroscopy; *Earth and Planetary Science Letters*, 247 pp. 10-25.
- Maloof, A.C.**, Halverson, G.P., Kirschvink, J.L., Schrag, D.P., Weiss, B.P., and Hoffman, P.F. 2006, Combined paleomagnetic, isotopic and stratigraphic evidence for true polar wander from the Neoproterozoic Akademikerbreen Group, Svalbard; *Geological Society of America Bulletin*, 118 pp. 1099-1124.
- Halverson, G.P., Hoffman, P.F., Schrag, D.P., **Maloof, A.C.**, and Rice, A.H.N. 2005, Toward a Neoproterozoic composite carbon-isotope record; *Geological Society of America Bulletin* 117 pp. 1181-1207.
- Maloof, A.C.**, Schrag, D.P., Crowley, J.L., and Bowring, S.A. 2005, An expanded record of Early Cambrian carbon cycling from the Anti-Atlas Margin, Morocco; *Canadian Journal of Earth Sciences*, 42 pp. 2195-2216.
- Halverson, G.P., **Maloof, A.C.**, Hoffman, P.F. 2004, The Marinoan glaciation (Neoproterozoic) in northeast Svalbard, *Basin Research* 16 pp. 297-324.
- Hoffman, P.F. and **Maloof, A.C.** 2003, Comment on: A complex microbiota from snowball Earth times: Microfossils from the Neoproterozoic Kingston Peak Formation, Death Valley, USA, by Corsetti, F.A., Awramik, S.M., and Pierce, D., *Proceedings of the National Academy of Sciences* 100 pp. 4399-4404.
- Maloof, A.C.**, Kellogg, J.B., and Anders, A.M. 2002, Neoproterozoic sand wedges: crack formation in frozen soils under diurnal forcing during a snowball Earth; *Earth and Planetary Science Letters* 204 pp. 1-15.
- Maloof, A.C.** 2000, Superposed folding at the junction of the inland and coastal belts, Damaran orogen, NW Namibia; *Communications of the Geological Survey of Namibia*, Henno Martin Commemorative Volume 12 pp. 89-98.
- Hoffman, P.F. and **Maloof, A.C.** 1999, The Snowball theory still holds water; *Nature* 397 p. 384.

ARTICLES IN PRESS, IN REVIEW OR IN PREPARATION

- Halverson, G.P., Dudas, F.O., **Maloof, A.C.** and Bowring, S.A., Evolution of the $^{87}\text{Sr}/^{86}\text{Sr}$ composition of Neoproterozoic seawater; *Palaeogeography, Palaeoclimatology, Palaeoecology*, in press.
- Maloof, A.C.**, Fike, D.A., Crowley, J.L., Bowring, S.A., Dudas, F.Ö. and Schrag, D.P., U-Pb zircon, $\delta^{13}\text{C}(\text{carb})$, $\delta^{13}\text{C}_{\text{org}}$, $\delta^{34}\text{S}_{\text{cas}}$, $\delta^{34}\text{S}_{\text{sulfide}}$, V/Cr, U/Th and $^{87}\text{Sr}/^{86}\text{Sr}$ constraints on carbon cycle dynamics at the Nemakit-Daldyn→Tommotian boundary, 525 Ma, Morocco.

Maloof, A.C., Stewart-Mukhopadhyay, S.T., Weiss, B.P., Soule, S.A., Swanson-Hysell, N., Pousart, Pascale M., Garrick-Bethell, I. and Louzada, K.L., The geology of Lonar Crater, in prep.

Maloof, A.C., Grotzinger, J.P., and Mohrig, D., Migration rates of tidal channels on a Modern carbonate platform and the origin of stratigraphic parasequences, Triple Goose Creek, Andros Island, Bahamas, in prep.

MEMBERSHIPS

Geological Society of America
American Geophysical union
Sigma Xi

INVITED VISITS/TALKS (SINCE FALL 2006)

04/08/08	Stanford Geological and Environmental Sciences
10/11/07	NSF Critical Transitions in the History of Life workshop
10/10/07	Rutgers Geological Sciences
05/14/07	Yale Geology and Geophysics, Geobiology of the Proterozoic-Cambrian conference
Fall 2006	Rice Earth Sciences (declined)
10/24/06	GSA T110. Magnetostratigraphy of Critical Intervals in Earth History

COURSES TAUGHT

FRS 149 Earth's Changing Surface & Climate [Fall, with F.J. Simons]: How does Earth's surface evolve in response to internal (e.g., tectonic), external (e.g., extraterrestrial), and anthropogenic (e.g., engineering and resource use) forcing? This course is composed of weekly 3-hour seminars on the size and shape of Earth in our solar system, topography, gravity, tectonics, climate and Earth history designed to provide a basic understanding of the processes that shape Earth's surface. We emphasize data collection and analysis using free internet data sources and software such as MatLab and ARCGIS. The centerpiece of the course is a 7 day field trip to the Mono-Inyo Crater system on the south shore of Mono Lake, where students combine geologic observations with quantitative measurements of topography, gravity, and weather to tell a story of Earth surface change in the region. The course culminates in group presentations and written reports that combine original field observations, internet data sources and modern software. FIELD TRIP: SIERRA NEVADA, CALIFORNIA [7 DAYS]

GEO 450 Earth Surface Processes [Spring]: This course presents a treatment of the physical processes that shape Earth's surface, such as solar radiation, the flow of water (vapor, liquid, and solid) under the influence of gravitational and capillary forces, and deformation of the solid Earth. In particular, the generation, transport, and preservation of sediment in response to these processes is studied in order to better read stories of Earth history in the geologic record and to better understand processes involved in modern and ancient environmental change. FIELD TRIPS: BAHAMAS [10 DAYS], KENTUCKY [4 DAYS], NEW YORK [3 DAYS].

GEO 559 Topics in Earth History [Spring]: This seminar considers the regional sea level effects of long-term and catastrophic landscape change under the influence of repeated glaciation since the Pliocene. How can we use regional sea level records to construct a self-consistent history of Plio-Pleistocene eustasy? How has 'baseline' sea level changed over the past ~5 My., and what relative proportion of this change is due to ice volume, landscape evolution, and the magnitude and orientation of Earth's spin vector?

PRINCETON STUDENT ADVISING

2007 → Bob Kopp (Postdoc, with Michael Oppenheimer - WWS)
2007 → Catherine Rose (Ph.D.)
2006 → Nicholas Swanson-Hysell (Ph.D.)
2006 → Hoan Bui Dang (Ph.D., with Mike Romalis - Physics)
2006 → James Hamm '08 (JP/ST with Mike Romalis - Physics)
Fall 2006 Bamidele Otemuyiwa '08 (JP)
Spring 2006 Ellen Zuckerman '07 (ST, with Danny Sigman)
Spring 2007 Meredith Wall '08 (JP)
2006 → Julie Dickerson '10 (Lab Work)
2006 → Becca Levin '10 (Lab Work)
2006 Morgan Fowler '10 (Lab Work)

PRINCETON GEOSCIENCE COMMITTEES

2007 → Faculty Search Committee (with Rubin, Duffy, and Simons)
2007 → Geosciences Web Site Committee (with Myneni, Simons and Mohr)
2006 → Undergraduate Work Committee (with Myneni, Duffy and Sigman)
2006 → Faculty Meeting Secretary
2006 Research: The effectiveness of field courses in Geosciences