THE UNIVERSITY OF ARIZONA

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Positions Held

2016 – present	Assistant Professor, University of Arizona
2013 – 2016	Associate Research Scholar, Princeton University
2010 – 2013	Postdoctoral Research Associate, Princeton University
2006 – 2010	Research Assistant, University of Colorado at Boulder
2004 – 2006	Teaching Assistant, University of Colorado at Boulder
2000 – 2004	Lab Assistant, GIS Lab, Cornell University

Education

12/2010 — University of Colorado at Boulder, Boulder, CO
Ph.D., Geophysics, Department of Geological Sciences
Advisors: Peter Molnar and Shijie Zhong
Topic: The effects of lithospheric thickness variations on the dynamics of the Earth's upper mantle.

5/2004 — Cornell University, Ithaca, NY
B.S., Geological Sciences, Department of Earth and Atmospheric Sciences

Research Funding

2016	NASA, *Determining Earth Structure from the Local Dynamic Geoid* [NASA–NNX17AE18G], $460,506, 2017–2019, Sole-PI
2014	NOAA GFDL, Princeton CICS Grant Awardee, *Terrestrial ice mass loss and the sea-level budget*, 6 months salary support. [NA08OAR4320752]
2012	NSF, *Mapping the evolution of Antarctica's mass balance* [NSF–1245788], $284,392, 2013–2015 (Co-I with F. J. Simons)
2012	NOAA GFDL, Princeton CICS Grant Awardee, *Mapping Antarctica's mass loss in space and time*, 6 months salary support. [NA08OAR4320752]

Teaching Experience

Spring 2017	*Geodynamics*, University of Arizona GEOS 440/540.
Fall 2015	Instructor, *State of the Earth: Shifts and Cycles*, course by A. C. Maloof and F. J. Simons, Princeton FRS 135.
Fall 2015	Instructor, *Data, Models, and Uncertainty in the Natural Sciences*, course by F. J. Simons, Princeton GEO 422.
Fall 2013	Guest Lecturer, *Global Geophysics*, course by F. J. Simons, Princeton GEO 371
Spring 2012	Instructor, *Origin and Evolution of the Continental Lithosphere*, with F. J. Simons and B. Schoene, Princeton GEO 556
Spring 2005 – 2006	Instructor, Geol 1030: *Introduction to Geology* Lab University of Colorado
Fall 2004	Instructor, Geol 3120 Lab: *Structural Geology* Lab University of Colorado

Publications

Manuscripts
http://goo.gl/sNDvUD

Mitrovica, J. X., C. C. Hay, R. E. Kopp, and **C. Harig**.
Quantifying the sensitivity of sea level change in coastal localities to the geometry of polar ice mass flux.
Submitted.

Chen, X., X. Zhang, J. A. Church, M. A. King, C. S. Watson, D. Monselesan, B. Legresy, and **C. Harig**.
The increasing rate of global mean sea–level rise during 1993–2014.
In Revision.

Mordret, A., D. Mikesell, **C. Harig**, B. P. Lipovsky, and G. A. Prieto.
Monitoring South-West Greenland's ice sheet melt with ambient seismic noise.
Science Advances, 2 (5), e1501538, 2016.
http://dx.doi.org/10.1126/sciadv.1501538

Harig, C. and F. J. Simons.
Ice mass loss in Greenland, the Gulf of Alaska, and the Canadian Archipelago: Seasonal cycles and decadal trends.
Geophys. Res. Let., 43 (7), 3150–3159, 2016.
http://dx.doi.org/10.1002/2016GL067759

Harig, C. and F. J. Simons.
Accelerated West Antarctic ice mass loss continues to outpace East Antarctic gains.
Earth Planet. Sci. Let., 415, 134–141, 2015.
http://dx.doi.org/10.1016/j.epsl.2015.01.029
Covered by over 15 media outlets worldwide, including *The Guardian*.
In the top 1% of all articles scored by Altmetric http://goo.gl/ZSU5PN and ranked #4 of 1277 of articles from *Earth Planet. Sci. Let.*

Harig, C., K. W. Lewis, A. Plattner, and F. J. Simons.
A suite of software analyzes data on the sphere,
Eos, 96, 2015. http://dx.doi.org/10.1029/2015EO025851

Morrow, E., J. X. Mitrovica, M. G. Sterenborg, and **C. Harig**.
A test of recent inferences of net polar ice mass balance based on long-wavelength gravity.
Journal of Climate, 26, 6535–6540, 2013.
http://dx.doi.org/10.1175/JCLI-D-13-00078.1

Harig, C. and F. J. Simons.
Mapping Greenland's mass loss in space and time.
Proc. Natl. Acad. Sc., 109(49), 19934–19937, 2012.
http://dx.doi.org/10.1073/pnas.1206785109
Covered by over 20 media outlets worldwide, including *CBSNews.com*.
In the top 2% of all articles scored by Altmetric http://goo.gl/0iXsd2 and in the 93rd percentile of articles from *Proc. Natl. Acad. Sc.*

Harig, C., S. Zhong, and F. J. Simons.
Constraints on upper mantle viscosity from the flow-induced pressure gradient across the Australian continental keel.
Geochem., Geophys., Geosyst., 11(6), Q06004, 2010.
http://dx.doi.org/10.1029/2010GC003038

Harig, C., P. Molnar, and G. A. Houseman.
Lithospheric thinning and localization of deformation during Rayleigh-Taylor instability with nonlinear rheology and implications for intracontinental magmatism.
J. Geophys. Res., 115, B02205, 2010.
http://dx.doi.org/10.1029/2009JB006422

Harig, C., P. Molnar, and G. A. Houseman.
Rayleigh-Taylor instability under a shear stress free top boundary condition and its relevance to removal of mantle lithosphere from beneath the Sierra Nevada.
Tectonics, 27, TC6019, 2008.
http://dx.doi.org/10.1029/2007TC002241

Published Software: Main Author

SLEPIAN_Delta: *Analysis of time-variable gravity from the GRACE satellite mission using Spherical Harmonics and spherical Slepian functions*, version 1.0, 2014.
http://csdms.colorado.edu/wiki/Model:SLEPIAN_Delta
http://dx.doi.org/10.5281/zenodo.15707

Published Software: Contributing Author

SLEPIAN_Alpha: *Computation of Spherical Harmonics, Slepian functions, and transforms*, version 1.0, 2014.
http://csdms.colorado.edu/wiki/Model:SLEPIAN_Alpha
http://dx.doi.org/10.5281/zenodo.15704

SLEPIAN_Bravo: *Linear inverse problems using Spherical Harmonics and spherical Slepian functions*, version 1.0, 2014.
http://csdms.colorado.edu/wiki/Model:SLEPIAN_Bravo
http://dx.doi.org/10.5281/zenodo.15705

SLEPIAN_Charlie: *Spectral estimation problems using Spherical Harmonics and spherical Slepian functions*, version 1.0, 2014.
http://csdms.colorado.edu/wiki/Model:SLEPIAN_Charlie
http://dx.doi.org/10.5281/zenodo.15706

Technical Skills

Scientific	Accomplished in the fields of climate science, satellite gravimetry, and geodynamics. Expertise in fluid dynamics, rheology and deformation of Earth's lithosphere and upper-mantle, Earth's potential (gravitational) field, mass balance of polar ice sheets, and applied mathematical methods for spatiospectral analysis on the sphere. Familiar with seismic and geodetic observational methods.
Technology	Expert in finite element methods and analysis relating to fluid dynamics. Proficient with C and MATLAB programming, Unix scripting/operating environments, and LaTeXdocument preparation. Experience with parallel computing environments (mpi), FORTRAN, Python, Generic Mapping Tools, ArcGIS, and standard office programs.

Awards

2012, 2014	NOAA GFDL, Princeton CICS Grant Awardee
2010	University of Colorado Summer Graduate School Fellowship
2008 – 2009	CIRES Graduate Student Fellow
2008	W. O. Thompson Fund Awardee (University of Colorado)
2006 Fall AGU	Outstanding Student Paper Award

Invited Presentations

Lectures in Academic Departments:	2016: University of Arizona (3/2016), University of Houston (1/2016) 2015: Lamont-Doherty Earth Observatory, NY (4/2015), Southwest Research Institute, Boulder, CO (1/2015) 2014: Carnegie Institution for Science, Department of Terrestrial Magnetism *Ice Caps Melting on a Deforming Earth: New Constraints from Satellite Gravity* `http://youtu.be/4GbcFsgFClA` (3/2014) 2013: Princeton University Solid Earth Brownbag (9/2013) 2010: Princeton University Solid Earth Brownbag (4/2010)
Invited Lectures at Workshops, and Outreach Activities:	2017: Osher Lifelong Learning Institute, Tucson, AZ (2/2017) 2016: Lindblad / National Geographic Expedition: Journey to Antarctica, the White Continent (3×) (12/2016) 2015: CIDER Summer Program, Berkeley, CA `http://youtu.be/Cq3w3a_NaRY` (short talk, open solicitation, 7/2015) 2014: The Center for Sea-Level Change Annual Workshop, NYU Abu Dhabi, UAE (4/2014) (2×), SIAM/AMS/MAA Joint Mathematics Meeting, Minisymposium on Frontiers in Geomathematics, Baltimore, MD (1/2014) 2013: Concordia Science Club, Princeton, NJ (9/2013) 2012: IAG–ICCT Regional Gravity and Geomagnetic Field Modeling Workshop, Bavarian Academy of Sciences & Humanities (BAdW) Munich, Germany (2/2012)

Service

Refereeing	National Science Foundation (EAR-Earthscope, EAR-GLD, EAR-PH), Annals of Glaciology, The Cryosphere, Earth and Planetary Science Letters, Geophysical Journal International, Geophysical Research Letters, Journal of Geodesy, Journal of Geophysical Research – Solid Earth, Monthly Weather Review
Community	AGU Fall Meeting Session Convener: GP - *Magnetic and Geodetic Investigations of Crust and Mantle of Earth and Other Planets and Moons* (2017) SEDI - *Constraints on Heterogeneities in Earth's Mantle* (2015) NAGT - *Early Career Geoscience Faculty Workshop* (2017) *Teaching Geoscience with MATLAB* workshop, by SERC at Carleton College. (2015) NASA Program for Arctic Regional Climate Assessment (PARCA) meeting participant (2012–2016) National Academy of Sciences (NAS), Antarctica Science Priorities Committee, Community outreach meeting participant (2014) Member, American Geophysical Union (2006–) Member, American Mathematical Society (2014–) Member Representative for Univ. Arizona, Computational Infrastructure for Geodynamics (CIG) (2016–)
Arizona	*Ph.D. Diagnostic Exam Committees:* Lisa Jose (Geodesy, *2020) *Other committees:* Geosciences Colloquium Organizer (2017–2018); Earth Dynamics Observatory Search Advisory Committee (2017); Geosciences Graduate Admissions Committee (2016–);
Princeton	Co-Founder, Princeton Department of Geosciences Post-doc council (2015); Princeton Department of Geosciences, Advisory Council Post-doc rep. (2014); Organizer, Princeton Solid Earth Brownbag Seminar series (2011);

Advising

Senior Theses	Alyson Beveridge (Princeton, Geosciences, '16): *Mass balance of glaciers in high–mountain Asia using time–variable gravity.* (2016)
Junior Theses	Mrinalini Basu (Princeton, Physics, '15): *Modeling mass changes in California with* GRACE (2014)

Media

On "*Ice mass loss in Greenland, the Gulf of Alaska, and the Canadian Archipegalo: Seasonal cycles and decadal trends*":

Satellites detect both steady and accelerated ice loss, by Christina Langone
Glacier Hub, 05/24/2016 (web)

Scientists use gravity to measure Arctic glacier loss, by Lisa Gregoire
Nunatsiaq Online, 04/05/2016 (web)

The vast, shrinking northern glaciers that we never even talk about, by Chris Mooney
Washington Post, 03/17/2016 (web)
Also reported in,
Guelph Mercury, 03/17/2016 (web)
News Miner, 03/17/2016 (web)
Hamilton Spectator, 03/17/2016 (web)

On "*Accelerated West Antarctic ice mass loss continues to outpace East Antarctic gains*":

Ice loss in west Antarctica is speeding up, by John Abraham
The Guardian, 05/11/2015 (web)

Melting Antarctic: Failure to act now on emissions could raise oceans by metres, by Graham Readfearn
The Guardian, 05/05/2015 (web)

Scientists horrified by speed of glaciers melting, by Russell Jackson
The Scotsman, 05/04/2015 (web)

Gravity data shows Antarctic ice sheet is melting much faster
Delhi Daily News, 05/02/2015 (web)

Antarctica is melting ever faster, by Jenna Iacurci
Nature World News, 05/01/2015 (web)

Satellite data helps pinpoint Antarctic ice loss, by Bob Berwyn
Summit County Voice, 05/01/2015 (web)

Gravity data show that Antarctic ice sheet is melting increasingly faster, by M. Kelly, *News@Princeton*, 04/30/2015 (web)
Also reported in,
Phys.org, 04/30/2015 (web)
Science 2.0, 05/01/2015 (web)
e Science News, 05/01/2015 (web)
Daily News and Analysis, 05/01/2015 (web)
ENCmag.com, 05/01/2015 (web)
R & D Magazine, 05/01/2015 (web)
Web India, 05/01/2015 (web)
Deccan Herald, 05/01/2015 (web)
Noticiasdelaciencia.com, 05/04/2015 (web, in Spanish)

Climat : la Terre perd son congélateur, by Sylvestre Huet
Libération, 04/02/2015 (web and print, in French)

On "*Mapping Greenland's mass loss in space and time*":

Climate Change 2013: The Physical Science Basis,
Intergovernmental Panel on Climate Change, Fifth Assessment Report (AR5-WG1), 2013

New science upsets calculations on sea level rise, climate change,
by Lewis Page,
The Register, 11/28/2012 (web)

El hielo de Groenlandia no se derrite tan rápidamente como se había estimado,
cienciaaldia.com, 11/28/2012 (in Spanish)

Embracing data 'noise' bring Greenland's complex ice melt into focus, by M. Kelly,
News@Princeton, 11/27/2012 (web)

Änderungen in der Schwerkraft verraten Eisschmelze,
derStandard.at, 11/24/2012 (in German)

Le Groenland fond avec gravité, by Sylvestre Huet,
Libération, 11/22/2012 (in French)

De rafelranden van de ijskap, by Elmar Veerman,
Wetenschap24.nl, 11/21/2012 (In Dutch)

Greenland ice loss is accelerating, by Sunanda Creagh,
TheConversation.edu.au, 11/20/2012 (web)

Greenland ice is melting at ever faster rates, by Laura Sinpetru,
Softpedia.com, 11/20/2012 (web)

Geoscientists report Greenland ice sheet melting rate is increasing,
by Bob Yirka,
Phys.org, 11/20/2012 (web)

Greenland ice melt accelerating, by Larry O'Hanlon,
ABC.net.au, 11/20/2012 (web)

Coste della Groenlandia sempre più povere di ghiacci, Sciolti 200 miliardi di tonnellate in 10 anni,
Meteoleontinoi, 11/20/2012 (in Italian)

Degelo na Gronelåndia mapeado,
CienciaHoje, 11/20/2012 (in Portuguese)

Groenlandia ha perdido 200.000 millones de toneladas de hielo en la última década,
ABC.es, 11/20/2012 (in Spanish)

Eispanzer Grönlands schmilzt ungleichmässig ab,
Südostschweiz.ch, 11/19/2012 (in German)
Blick.ch, 11/19/2012 (in German)

Greenland ice melt is accelerating, by Douglas Main,
CBSNews.com, 11/19/2012 (web)
OurAmazingPlanet.com, 11/19/2012 (web)

Greenland is losing 200 billion tons of ice every year, by Randy Astaiza, *BusinessInsider.com*, 11/19/2012 (web)

Greenland loses 200 billion tons ice per year, by Larry O'Hanlon, *MSNBC.msn.com*, 12/03/2012 (web)
Discovery.com, 11/19/2012 (web)
LiveScience.com, 11/19/2012 (web)

General Media Appearances:

Greenland's huge annual ice loss is even worse than thought, by Damian Carrington
The Guardian, 9/21/2016 (web)

Mackenzie, Dana. "Climate Past, Present, and Future" in *What's Happening in the Mathematical Sciences*, Providence: Sergei Gelfand, American Mathematical Society, 2016. 36-51. Print.

A controversial NASA study says Antarctica is gaining ice. Here's why you should be skeptical, by Chris Mooney
Washington Post, 11/05/2015 (web)

'Stable' region of Antarctica is melting; Radar data from Cryosat-2 probe show sudden ice loss on southern Antarctic Peninsula, by Jeff Tollefson
Nature, 05/21/2015 `http://dx.doi.org/10.1038/nature.2015.17606`