JESSICA R STANLEY

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EDUCATION

University of Colorado at Boulder, Boulder, CO 2010-2015
PhD, Geological Sciences
Thesis: *Discerning erosion patterns and mantle sources of topography across the southern African Plateau from the shallow and deep records of kimberlites*
Advisor: Rebecca Flowers

Massachusetts Institute of Technology, Cambridge, MA 2008-2009
MSc, Earth and Planetary Science, GPA: 5.0/5.0
Thesis: *The lattice preferred orientation of olivine in Beni Bousera ultramafic massif, Morocco*
Advisor: Oliver Jagoutz

Massachusetts Institute of Technology, Cambridge, MA 2004-2008
BS, Earth, Atmospheric and Planetary Science, GPA 4.8/5.0
Senior Thesis: *Using thermochronology to constrain exhumation in the Swiss-Italian Alps*
Advisor: Samuel Bowring

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher Nov. 2015-present
University of Colorado at Boulder, Boulder, CO
Advisor: Rebecca Flowers

MIT International Science and Technology Initiatives Intern Aug.-Dec. 2009
La Comisíon Federal de Electricidad, Mexico City, DF, Mexico
Investigated the environmental impacts of adding carbon dioxide capture and storage to Mexican power plants.

GRANTS, FELLOWSHIPS, and AWARDS

2011-2016 NSF Graduate Research Fellowship
2015 CU Department of Geological Sciences Travel Grant
2015 American Association of University Women Dissertation Fellowship [Alternate]
2014 Student Presentation Award, 14th International Conference on Thermochronology
2014 CU Geological Sciences Undergraduate Mentorship Grant
2013 CIDER Research Grant
2008 Goetze Prize for Undergraduate Research, MIT

PUBLICATIONS

Published

Stanley, J. R., R. M. Flowers, D. R. Bell (2015). Erosion patterns and mantle sources of topographic change across the southern African Plateau derived from the shallow and deep records of kimberlites. *Geochemistry, Geophysics, Geosystems.* doi: 10.1002/2015GC005969

Álvarez-Valero, A. M., O. Jagoutz, **J. R. Stanley**, C. Manthei, A. El Maz, A. Moukadiri. (2014). Crustal attenuation as a tracer for the Beni Bousera ultramafic massif (Betico-Rifean Belt). *Geological Society of America Bulletin.* v. 16(11-12) p. 1614-1624. doi:10.1130/B31040.1

Stanley, J. R., R. M. Flowers, and D. R. Bell. (2013). Kimberlite (U-Th)/He dating links surface erosion with lithospheric heating, thinning, and metasomatism in the southern African Plateau: *Geology.* v. 41(12) p. 1243-1246. doi: 10.1130/G34797.1

Stanley, J. R. and M. Dávila-Serrano. (2012). A life cycle assessment of a coal fired power plant with carbon capture and storage in Mexico: *International Journal of Physical Sciences.* v. 7(41) p. 5624-5641. doi: 10.5897/IJPS10.351

Dávila-Serrano, M., O. Jiménez, R. Castro, V. Arévalo, **J. Stanley**, and L. M. Cabrera. (2010). A preliminary selection of regions in Mexico with potential for geological carbon storage: *International Journal of Physical Sciences.* v. 5(5) p. 408-414.

In Preparation

Stanley, J. R., and R. M. Flowers. (*in prep*). Dating kimberlite emplacement with zircon and perovskite (U-Th)/He geochronology. To be submitted to *Earth and Planetary Science Letters* in May 2016.

Stanley, J. R. and R. M. Flowers. (*in prep.*). Relationships between mantle dynamics, lithospheric architecture, plateau uplift, and Orange River evolution in southwestern Africa. To be submitted to *Earth and Planetary Science Letters* in June 2016.

Stanley, J. R., J. Braun, and R. M. Flowers. (*in prep.*). Exploring erosion and uplift in southern Africa using landscape evolution modeling combined with thermochronology, sedimentary flux volumes, topography and geology. To be submitted to *Journal of Geophysical Research.*

ABSTRACTS and PRESENTATIONS

Stanley, J. R., R. M. Flowers. (2015). Dating Kimberlite Eruption and Erosion Phases Using Perovskite, Zircon, and Apatite (U-Th)/He Geochronology to Link Cratonic Lithosphere Evolution and Surface Processes. *AGU Fall Meeting 2015*, abs#V-31G-05 (oral)

Flowers, R. M., J. Baughman, J. Johnson, R. Landman, **J. R. Stanley**, W. Weisberg, J. R. Metcalf. (2015). Expanding the temperature sensitivity range and applicability of the (U-Th)/He system: some examples. *GSA Annual Meeting 2015.* (invited, submitted)

Stanley, J.R., R. M. Flowers, D. R. Bell. (2015). Erosion patterns and mantle sources of topographic change across the southern African Plateau from coupling the shallow and deep records of kimberlites. CIDER Workshop on Dynamic Topography and Surface Processes, Boulder, CO. (oral, no abstracts submitted for this workshop)

Stanley, J. R., R. M. Flowers, D. R. Bell. (2014). (U-Th)/He dating of apatite and zircon constrains erosion patterns and emplacement ages of kimberlites across the Kaapvaal Craton. *14th International Conference on Thermochronology.* Chamonix, France. (poster, winner of student poster prize)

Stanley, J. R., R. M. Flowers, D. R. Bell. (2013). Combining kimberlite (U-Th)/He dating with the mantle xenolith record to decipher elevation change in continental interiors: and example from the southern African Plateau. *AGU Fall Meeting 2013*, abs# T42B-04 (oral)

Flowers, R. M., **J. R. Stanley** (2013). Apatite (U-Th)/He thermochonology of the southern African Plateau. *TopoAfrica workshop*, George, South Africa, January 2013. (oral)

Stanley, J. R., R. M. Flowers, D. R. Bell. (2012) Apatite (U-Th)/He dating of kimberlites, links with mantle xenolith evolution, and implications for uplift of the southern African Plateau. *AGU Fall Meeting 2012*, abs# T21D-2595 (poster)

Stanley, J. R., R. M. Flowers. (2011). Using apatite (U-Th)/He thermochronometry to resolve regional unroofing patterns across the interior of the southern African Plateau and implications for mantle dynamics. *AGU Fall Meeting 2011,* abs# T33D-2439 (poster)

Stanley, J. R., O. Jagoutz, G. Hirth, K. Targuisti. (2010). Melt percolation and associated deformation: field and microstructural evidence from the Beni Bousera ultramafic massif. *AGU Fall Meeting 2010,* abs# T21H-08 (oral)

Jagoutz, O., **J. R. Stanley**, A. Gysi, C Manthei, S. Whittemore, G. Hirth (2010). Deformation associated with melt percolation in the upper mantle: Field, structural and petrological evidence from the Beni Bousera ultramafic massif (NE Morocco). *2010 GSA Denver Annual Meeting,* abs#179074 (oral)

Jagoutz, O., **J. R. Stanley**, A. Gysi, G. Hirth, C. Manthei, K. Targuisti, I. Amri. (2009). Dynamics of melt extraction channels? Evidence from the Beni Bousera ultramafic massif. *AGU Fall Meeting 2009* abs# T11E-3 (oral)

EXPERIENCE

Field Experience

Southern African Plateau, South Africa, Namibia and Botswana, (Summers 2011, 2012, 2013) – fieldwork and sampling kimberlite and bedrock for (U-Th)/He geo- and thermochronometry. PhD research.

Beni Bousera peridotite massif, Morocco (October 2008, June 2010) – field mapping of peridotite structures, textures, and lithologies. Sampling for EBSD and geochemical analyses. MSc thesis research.

Lepontine Dome, Swiss-Italian Alps (Summer 2007) – Fieldwork and collection of elevation transect samples for (U-Th)/He and Fission Track thermochronometry. NSF-Research Experiences for Undergraduates and Keck Geology Consortium trip. B.S. thesis research.

Skagit Gneiss Complex, eastern North Cascades, Washington (Summers 2006, 2008) – field mapping of gneiss fabrics and structures, sample collection for U-Pb geochronology. Field assistant to Noah McLean.

Maerewhenua and Borland areas, New Zealand (Spring 2007) – mapping. Field course at University of Otago, Dunedin, New Zealand.

Laboratory Experience

University of Colorado Thermochronology Research and Instrumentation Laboratory (April 2012-present)
Apatite, zircon and perovskite (U-Th)/He thermochronometry using ASI Alphachron, Thermo Element 2 ICP-MS, and standard mineral separation and dissolution techniques; PhD research.

Brown University Electron Microscope Facility (Fall 2008- Spring 2009)
Lattice preferred orientation of olivine using a scanning electron microscope equipped with Electron Backscatter Diffraction (EBSD) detectors. MSc research.

MIT Isotope Geochemistry and Geochronology Lab (2007-2008)
Prepared samples for ID-TIMS U-Pb geochronology and (U-Th)/He thermochronology.

Teaching Experience

Teaching Assistant, University of Colorado Boulder (Fall 2014, Spring 2015)
Introduction to Geology Lab (GEOL1030)

Teaching Assistant, Massachusetts Institute of Technology (Spring 2009)
Introduction to Geology (12.001)

Undergraduate Teaching Assistant, Massachusetts Institute of Technology (Fall 2005)
Physics 1: Classical Mechanics (8.01)

OTHER ACTIVITIES

Mentorship Activities

Undergraduate research supervisor, University of Colorado (Spring and Summer 2014). Research mentor to Melissa Lowe in her study using (U-Th)/He thermochronometry on rocks from the west coast of South Africa.

Writing mentor, UNAVCO RESESS internship program (Summer 2014). Mentor to undergraduate Belinda Gonzalez, studying the geochemistry of tertiary intrusive rocks in the Rocky Mountains. Research Experiences in Solid Earth Science for Students (RESESS) is a summer internship program for undergraduates aimed at increasing the diversity of students pursuing geosciences.

Field Research Mentor (Summer 2013). Mentor to Maria Shipapo, a Namibian BSc student who acted as my field assistant. Exposed her to thermochronology related field geology and helped her to develop a potential research idea for her Honors thesis on the incision history of the Orange River and write a short proposal on this idea.

Field Research Mentor (Summer 2012). Mentor to Warren Miller, a South African MSc student who served as my field assistant. Introduced him to thermochronometry and related fieldwork and helped him to clarify and streamline his MSc thesis project on the Gamtoos Group, a tectonic window in the southern Cape, South Africa.

Collaborative Activities

Research Stay, ISTerre Université Joseph Fourier, Grenoble, France (May-June 2015). Collaboration with Jean Braun to integrate thermochronologic, depositional and other geologic constraints into a landscape evolution model to investigate the surface uplift history of southern Africa.

Participant, CIDER (Cooperative Institute for Dynamic Earth Research) summer program, UC Berkeley, CA (July 2013). The goal of the CIDER summer program is to produce a "synthesis center" to foster interdisciplinary collaboration to tackle fundamental questions in earth science. The theme for 2013 was "From mantle to crust: continental formation and destruction". My participation resulted in the funding of a CIDER research grant entitled "Residual topography of Precambrian shields, a comparison of Precambrian S. Africa and E. Antarctica" with collaborators Andrew Lloyd, Thorsten Becker, Shijie Zhong, Rick Carlson, Becky Flowers and Doug Wiens.

Outreach and Informal Teaching Activities

Poster evaluator (July 2015). Evaluated posters and gave feedback to undergraduates in the UNAVCO RESESS internship program. The RESESS program aims encourage participation from groups underrepresented in the geosciences.

Field trip co-leader for the UNAVCO RESESS internship program (June 2013, July 2014, June 2015). Helped to teach participants about the local geology.

Participant in a Google Mapping Technologies workshop at the Structural Geology and Tectonics Forum, Golden, CO (June 2014). Course was aimed at helping participants learn to use Google maps effectively in the classroom.

Speaker at the CU Graduate STEMinar series, Boulder, CO (February 2014). The STEMinar series is a forum for graduate students in STEM fields to share their research and encourage interdisciplinary collaborations. Talk entitled "Tectonics, Topography and Treasure: Investigating the origins of topography in southern Africa".

Co-Organizer, 1.25 day short course "An introduction to low temperature thermochronology" at the African Earth Observatory Network, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa. (August 13-14, 2013). Workshop attended by 19 African Honors students, graduate students, and postdocs.

Created a fieldwork blog (Summers 2012 and 2013) aimed at conveying my research questions and the experience of doing geologic fieldwork to a broad, non-scientific audience. tectonicsandtreasure.wordpress.com

Speaker at panel discussions at CU about fellowship opportunities for graduate students (Fall 2011, 2012, 2013).

Course materials organizer, OpenCourseWare, MIT, Cambridge, MA (2008). Organized and prepared materials from the class Enivronmental Earth Science for publication on OpenCourseWare

Assistant Instructor, Sally Ride Science Camp, Education Unlimited, Berkeley, CA (Summer 2005). Taught and led science activities for middle school girls.

Service Activities

Geological Sciences representative to UGGS (United Government for Graduate Students), University of Colorado (Fall 2012-Spring 2013)

Organizer for graduate student invited colloquium speakers (Spring 2012)

Non-academic Activities

University Singers, University of Colorado (Fall 2010-present)

MIT Varsity Ski Team (2004-2008), Captain (2006-2008), Assistant Coach (2009-2010)

MIT Concert Choir (2004-2009)

Volunteer ski instructor, YES Kids, Boston MA (2005-2006). Youth Enrichment Services (YES) aims cultivate active lifestyles and positive values in inner-city youths by introducing them to outdoor activities.

PROFESSIONAL ORGANIZATIONS

Geological Society of America
American Geophysical Union