

Kira G. Olsen

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APPOINTMENTS

NASA Goddard Space Flight Center

NASA Postdoctoral Program, Universities Space Research Association Oct. 2020 - Present

CRESST II Postdoctoral Fellowship, Howard University

Oct. 2019 - Oct. 2020

Advisors: Dr. Terry Hurford (GSFC),

Dr. Nicholas Schmerr (University of Maryland)

EDUCATION

Ph.D. *Columbia University, New York, NY* 2019

Dissertation: *New Understanding of Iceberg Calving, Mass Loss, and Glacier Dynamics Through Analysis of Glacial Earthquakes*

Advisor: Dr. Meredith Nettles

M.Phil. *Columbia University, New York, NY* 2017

M.A. *Columbia University, New York, NY* 2016

B.A. *Colorado College, Colorado Springs, CO, cum laude* 2011

PUBLICATIONS (Published, Peer-reviewed)

Olsen K.G., T. Hurford, N. Schmerr, K. Brunt, S. Zipparo, MH. Huang, H. Cole, R.C. Aster (2021) Projected seismic activity at the Tiger Stripe Fractures on Enceladus, Saturn from an analog study of tidally modulated icequakes within the Ross Ice Shelf, Antarctica, *Journal of Geophysical Research: Planets*, **126** (6), e2021JE006862

Olsen K.G. and M. Nettles (2019) Constraints on terminus dynamics at Greenland glaciers from small glacial earthquakes, *Journal of Geophysical Research: Earth Surface*, **127** (7), 1899-1918

Olsen K.G. and M. Nettles (2017) Patterns in glacial-earthquake activity around Greenland, 2011-13. *Journal of Glaciology*, **63** (242), 1077-1089

PUBLICATIONS (Submitted)

Olsen K.G., M. Nettles, L.M. Cathles, J. Burton, T. Murray, T. James. Improved Estimation of Glacial-Earthquake Size Through New Modeling of the Seismic Source, *Journal of Geophysical Research: Earth Surface*

TEACHING EXPERIENCE

- Fall 2018: **Visiting Professor for Physical Geology (GY 140)**, Colorado College
Designed and led all lectures and labs, led eight days of field instruction, supervised teaching assistant
- Spring 2017: **TA for Solid Earth Dynamics (EESC 3201)**, Columbia University
- Fall 2016: **TA for The Solid Earth System (EESC 2200)**, Columbia University
- Spring 2016: **TA for Solid Earth Dynamics (EESC 3201)**, Columbia University
- Fall 2011: **TA for Mathematics and Geology of the Great American Desert (NS160)**, Colorado College

INVITED TALKS

- 2021 **Geological Society of Washington** – January Society Meeting
- 2019 **American Geophysical Union Fall Meeting** – Session S31A
- 2019 **Colorado College** – Geology Department Faculty Retirement Symposium
- 2019 **Princeton University** – Solid Earth Brown Bag Seminar
- 2018 **MIT** – Atmosphere, Ocean, and Climate Lunch Seminar
- 2018 **University of Tasmania** – Physics Department Seminar
- 2018 **Institute for Marine and Antarctic Studies**, Hobart, Tasmania – Division Seminar
- 2017 **Lamont-Doherty Earth Observatory** – Geodynamics Seminar
- 2017 **American Geophysical Union Fall Meeting** – Session U23B

HONORS & AWARDS

- ◆ NASA Postdoctoral Program Fellowship 2020
- ◆ NSF Graduate Research Fellowship 2016
- ◆ Outstanding Student Paper Award at AGU Fall Meeting 2016
- ◆ Rocky Mountain Association of Geologists Outstanding Senior Award 2011
- ◆ Association for Women Geoscientists Outstanding Student Award 2011
- ◆ Rocky Mtn. Assoc. of Geologists Outstanding Thesis Proposal Award 2011
- ◆ Crown-Goodman Presidential Scholarship Award 2010
- ◆ Patricia J. Buster Geology Research Scholarship Award 2010

FIELD EXPERIENCE & WORKSHOPS

- Greenland Ice Sheet** 2015, 2016
34 days servicing and retrieving broadband seismometers
- Karthus Summer School on Ice and Climate** 2015
10-day workshop, Karthus, Italy
- Cordoba, Argentina** 2010
15 days retrieving broadband seismometers
- Bighorn Mountains, Wyoming** 2010
10 days deploying geophones
- Rocky Mountain West** 2007-2011
94 days in the field with Colorado College geology classes

SCIENTIFIC INSTRUMENT DESIGN EXPERIENCE

- SUBLIME Seismometer for Future Lunar Missions** 2019 - Present
Advancing a novel lunar seismometer prototype to a flight-ready design
- Lunar Swath-Mapping LiDAR** 2020 - 2021
Worked with the NASA Goddard Instrument Design Lab as part of the 6th cohort of early-career scientists advancing a mission-ready lunar instrument through the NASA Goddard Planetary Science Winter School

LEADERSHIP & SERVICE

NASA:

- Goddard Association of Postdoctoral and Early Career Scholars Committee on Diversity, Equity, and Inclusion, *Committee Member* 2020 - Present
- NASA Planetary Science Division, *Review Panelist* 2020 - Present
- Reddit Ask-Me-Anything panel, Ocean Worlds Week, *Contributing Scientist* 2020

Columbia University:

- Student Seismology Workshop, *Organizer & Session Convener* 2015 – 2019
- Organized annual 55-person workshop for students.
 - Raised \$43,000 in workshop funding over five years.
- Girls' Science Day, *Co-Chair* 2015 – 2017
- Organized annual day of science experiments for 150 middle-school girls, facilitated by 100 graduate-student volunteers.
- New Student Outdoor Welcome Trip at LDEO, *Program Founder & Leader* 2015 – 2018
- Organized and raised sustainable funding for an annual three-day camping trip for all incoming Earth Science graduate students.
- Colloquium Committee, *Committee Member* 2015 – 2016
- Helped organize Lamont's weekly lecture series featuring colloquia given by leading scientists from other institutions.

RESEARCH SKILLS

Field Instrumentation: Broadband seismometer installation/maintenance/removal on ice and on land, geophone installation, GPS installation

Computer Languages: Python, MatLab, Shell Scripting, LATEX, GMT

Software: SAC, Adobe suite, Microsoft Office suite, Google Earth, Google Collaboratory, GitHub, QGIS

MEDIA COVERAGE

- ◆ A. Tripathy-Lang & W. Bohon (2020) Seismometers detect small icebergs produced by Greenland's glaciers, *IRIS Science Highlights*
- ◆ O. Sergienko (2019) Small Seismic Signals Tell a Story of Iceberg Calving, *Eos*
- ◆ J. Wendel (2017) More Frequent Glacial Quakes on Greenland Signal Ice Retreat, *Eos*

CONFERENCE ABSTRACTS

Siobhan Light, K.G. Olsen, Nicholas C Schmerr, Terry Hurford Jr, Kelly Brunt, Alyssa Rhoden (2021) How do we measure an icy shell? Seismic constraints on the thickness of an Antarctic ice shelf as an analog for icy-ocean worlds, *Submitted to AGU Fall Meeting 2021*

Mong-Han Huang, K.G. Olsen, Kathrine Udell Lopez, and Sophia Zipparo (2021) Icequakes and ice rheology along rifts within the Ross Ice Shelf, Antarctica, *Submitted to AGU Fall Meeting 2021*

Olsen K., N. Schmerr, S. Light, T. Hurford, K. Brunt (2021) Seismic investigation of Antarctic ice-shelf rifts as an analog for the fractured shells of icy-ocean worlds, *USGS Workshop on Terrestrial Analogs for Planetary Exploration*, Abstract 8068

Olsen K., N. Schmerr, MH. Huang, T. Hurford, K. Brunt (2021) Investigating icequakes on Enceladus using an Antarctic analog: Application of seismic and machine-learning techniques to characterize tidally induced seismicity along icy rifts, *Lunar and Planetary Science Conference 2021*

Olsen K., T. Hurford, N. Schmerr, S. Zipparo, K. Brunt, MH. Huang, H. Cole, R. Aster (2020) Deformation along Enceladus' Tiger Stripes: Insights from tidally modulated icequakes and stress release at Ross Ice Shelf rifts, Antarctica, *AGU Fall Meeting 2020*, Abstract P086-02

Olsen K. and M. Nettles (2019) Improved Understanding of the Relationship Between Iceberg Mass and Glacial-Earthquake Size Through New Modeling of the Seismic Source, *AGU Fall Meeting 2019*, Abstract S31A-03, **(invited)**

Olsen K. and M. Nettles (2018) Analysis of Regional Seismic Data Reveals Dominance of Buoyancy-Driven Calving at Greenland Glaciers, *AGU Fall Meeting 2018*, Abstract S41B-05

Olsen K. and M. Nettles (2018) Seismic precursors to iceberg-calving events, *IRIS Workshop 2018*

Olsen K. and M. Nettles (2017) High-Frequency Seismic Signals Associated with Glacial Earthquakes in Greenland, *AGU Fall Meeting 2017*, Abstract C41D-1258

Olsen K. and M. Nettles (2017) Glacial Earthquakes: Monitoring Greenland's Glaciers Using Broadband Seismic Data, *AGU Fall Meeting 2017*, Abstract U23B-03, **(invited)**

Olsen K. and M. Nettles (2017) Recent Glacial Earthquakes in Greenland, *Student Seismology Workshop 2017*

Olsen K. and M. Nettles (2016) Regional and Local Glacial-Earthquake Patterns in Greenland, *AGU Fall Meeting 2016*, Abstract C33C-0839

Olsen K. and M. Nettles (2016) Recent Glacial Earthquakes in Greenland, *IGS International Symposium on Interactions of Ice Sheets and Glaciers with the Ocean*

Olsen K. and M. Nettles (2015) Analysis of Recent Glacial Earthquakes in Greenland, *AGU Fall Meeting 2015*, Abstract C11C-0780

Olsen K., M.L Anderson, L. Linkimer, H.J. Gilbert, S.L. Beck, and P.M. Alvarado, (2010) Dynamics of Flat Slab Subduction: Focal Mechanisms, Ridge Buoyancy, & Slab Tear in Central Argentina, *AGU Fall Meeting 2010*, Abstract T11A-2047

Anderson M.L., L. Linkimer, K. Olsen, S.L Beck, P.M. Alvarado, and H.J. Gilbert, (2010) Flat-Slab Dynamics: Deformation in the Central Andean Subducting Slab, *AGU Fall Meeting 2010*, Abstract DI42A-06