

# HARRIET C.P. LAU

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## ADDRESS

Earth & Planetary Science  
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## POSITIONS

2019 – present	Assistant Professor EARTH AND PLANETARY SCIENCE, UNIVERSITY OF CALIFORNIA, BERKELEY, USA
2017 – 2019	Junior Fellow SOCIETY OF FELLOWS, HARVARD UNIVERSITY, USA

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## EDUCATION

2012 – 2017	HARVARD UNIVERSITY, USA Ph.D. in Earth and Planetary Sciences Thesis Advisor: Prof. Jerry X. Mitrovica
2008 – 2012	IMPERIAL COLLEGE LONDON, UK Master of Science in Geophysics (with First Class Honors) Thesis Advisors: Dr. Saskia Goes & Dr. Rhodri Davies
2010 – 2011	MASSACHUSETTS INSTITUTE OF TECHNOLOGY, USA Visiting student, Department of Earth Atmospheric & Planetary Sciences Academic Advisor: Prof. Daniel Rothman

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## AWARDS

2016	American Geophysical Union (AGU) <i>Study of the Deep Earth Interior Graduate Research Award</i>
2016	Harvard Graduate School of Arts and Sciences <i>Merit Research Fellowship</i>
2015	Geophysical Journal International's <i>Best Student Author Award</i> for "A normal mode treatment of semi-diurnal body tides on an aspherical, rotating and anelastic Earth"
2015	Departmental <i>Shaler Teaching Award</i> for Introduction to Global Geophysics (Fall 2014)
2013 – 2017	The Harvard Bok Center's <i>Certificate for Distinction in Teaching</i> (2013–2015, 2017)
2013	The AGU <i>Outstanding Student Paper Award</i> for the oral presentation of "Constraining Deep Earth Structure Using Tidal Tomography"
2012	Imperial College's <i>ESE Student Centenary Prize</i> for outstanding Masters Theses
2008 – 2012	Imperial College's <i>Ash Music Scholarship</i> for piano studies at the Royal College of Music

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## TEACHING

2021	Lecturer for "Geodynamics" (UC Berkeley)
2019 – 2021	Lecturer for "The Planet Earth" (UC Berkeley)
2020 – present	Founding member of <i>GeoContext</i> , an open source online resource for lecture material on the historical context of topics within Earth science.
2013 – 2017	Teaching Fellow for undergraduate courses "Global Geophysics" and "A Brief History of Earth" (Harvard)
2014	Volunteer Virtual Teaching: Remote lessons in natural disasters at Spring Hill Elementary School, Austin, TX
2011 – 2012	Teaching Assistant for undergraduate course in Statistics/Computing (Imperial)
2009 – 2010	Volunteer science teacher at elementary schools in disadvantaged areas in London (Pimlico Connection)

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MEMBERSHIPS	2013 – present	European Geosciences Union
	2012 – present	American Geophysical Union
	2012 – present	Associate of the Royal School of Mines

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## INVITED CONFERENCE PRESENTATIONS

- AGU (Dec 2021, session *Neither elastic nor harmonic: the Earth's transient behavior across time/length-scale*): tbd.
- AGU (Dec 2021, session *A Multidisciplinary Understanding of the Lower-Mantle Evolution and Thermochemical Status*): tbd.
- EGU (April 2021): “Frequency Dependent Mantle Viscoelasticity via the Complex Viscosity: cases from Antarctica and Western North America” (Abstract number: EGU21-1869)
- AGU (Dec 2020): “Reconciling estimates of viscoelastic mantle structure using transient rheology–Glacial Isostatic Adjustment across North America and Antarctica” (Abstract number: T013-06)
- AGU (Dec 2020): “How much and where? Exploring Excess Density within the LLSVPs by reconciling Stoneley Mode and Earth Tide Observations.” (Abstract number: DI009-03)

## INVITED TALKS/SEMINARS

- Kiel University (virtual), Sept 2021, *4D Deep Dynamic Earth Science Meeting*
- Univerität Bonn (virtual), Feb 2021, *Institut für Geodäsie und Geoinformation Seminar*
- Australian National University (virtual), Feb 2021, *Earth Science Seminar*
- University of Chicago (virtual), Jan 2021, *Departmental Seminar*
- Stanford (virtual), Oct 2020, *Geophysics Seminar*
- Caltech (Pasadena, CA), Mar 2020, *Caltech Seismo Lab Seminar*
- UCLA (Los Angeles, CA), Jan 2020, *Earth, Planetary, and Space Science Colloquium*
- UCSC (Santa Cruz, CA), Jan 2020, *Whole Earth Seminar*
- SAGE/GAGE Workshop (Portland, OR), Oct 2019, *Plenary Speaker on Earth Rheology and Structure: New Approaches, Applications, and Implications for Dynamics*
- European Geosciences Union Meeting (Vienna, Austria), April 2019, *Seminar on Mantle Structure and Evolution*
- Yale University, February 2019, *Departmental Colloquium*
- Johns Hopkins University, November 2018, *Bromery Lecture*
- University of British Columbia, September 2018, *Departmental Colloquium*
- Study of the Earth's Deep Interior Conference (Edmonton, Canada), July 2018, *Zatman Lecture*
- University of Michigan, Mar 2018, *Smith Lecture*
- McGill University, Feb 2018, *Earth and Planetary Sciences Department GEOTOP Lecture*
- Massachusetts Institute of Technology, May 2017, *Special Seminar*
- University of California Berkeley, March 2017, *Berkeley Earth and Planetary Science Departmental Seminar*
- Brown University, February 2017, *Lunch Bunch Seminar*
- Princeton University (Geosciences Department), October 2016, *Brown Bag Seminar*
- Columbia University (LDEO), April 2016, *Marine Geology and Geophysics/Seismology, Geodesy and Tectonics Seminar*

## PROPOSALS AWARDED

- 2019 – 2022      NSF1923865: “Constraints from Multiple Low Frequency Data on the Long Wavelength Density Structure in the Deep Mantle”.

## SERVICE

2018, 2020	AGU Session Convener
2017, 2020	NSF Proposal Reviewer
2020 – present	Louderback Committee member (UC Berkeley)
2020 – present	Member of the Global Seismic Network Standing Committee (Incorporated Research Institutions for Seismology)
2019 – present	Member of IAG (International Association of Geodesy)’s Joint Study Group
2019 – present	Ramsden Committee member (UC Berkeley)
2019 – present	Member of the EPS department’s Diversity, Equity, Inclusion and Accessibility Committee (UC Berkeley)

## PUBLICATIONS

- (22) 2021\* **Lau, H.C.P.** “Glacial Size as a Trigger for the Mid-Pleistocene Transition”, *in review at Nature Communications*.
- (19) 2021\* Richards, F., Hoggard, M., Ghelichkhan, S., Koelemeijer, P., and **Lau, H.C.P.** “Geodynamic, geodetic, and seismic constraints favour deflated and dense-cored LLVPs”, *submitted to Nature Geoscience*
- (21) 2021 Daher, H., ..., **Lau, H.C.P.**, et al. “Long-term Earth-Moon evolution with high-level orbit and ocean tide models”, *Journal of Geophysical Research: Planets*, doi: 10.1029/2021JE006875
- (18) 2021 Robson, A., **Lau, H.C.P.**, Koelemeijer, P.K., and Romanowicz, B. “Determining LLSVP density: reconciling Stoneley Modes and Earth tides”, *Geophysical Journal International*, ggab448, doi: 10.1093/gji/ggab448
- (17) 2021 **Lau, H.C.P.**, Austermann, J., Holtzman, B.K., Book, C., Havlin, C., Hopper, E., and Lloyd, A. “Reconciling estimates of viscoelastic mantle structure using transient rheology – examples from North America and Antarctica”, *Journal of Geophysical Research: Solid Earth*, 126, e2021JB022622, doi: 10.1029/2021JB022622.
- (16) 2021 **Lau, H.C.P.**, and Al-Attar, D. “Sensitivity kernels for body tides on laterally heterogeneous planets based on adjoint methods”, *Geophysical Journal International*, ggab254.
- (15) 2021 **Lau, H.C.P.**, and Romanowicz, B. “Constraining Jumps in Density and Elastic Properties at the 660 km discontinuity Using Normal Mode Data via the Backus-Gilbert Method”, *Geophysical Research Letters*, 48(9), e2020GL092217.
- (14) 2020 **Lau, H.C.P.**, Holtzman, B.K., and Havlin, C. “Towards a Self-consistent Characterization of Lithospheric Plates Using Full-spectrum Viscoelasticity”, *AGU Advances*, 4(1): e2020AV000205.
- (13) 2020 Austermann, J., Chen, C.Y., **Lau, H.C.P.**, Maloof, A.C., and Latychev, K. “Constraints on mantle viscosity and Laurentide ice sheet evolution from pluvial paleolake shorelines in the western United States”, *Earth and Planetary Science Letters*, 532: 116006.
- (12) 2019 **Lau, H.C.P.** and Holtzman, B.K. “ ‘Measures of dissipation in viscoelastic media’ extended: Towards continuous characterization across very broad geophysical time scales”, *Geophysical Research Letters*, 46(16): 9544-9553.
- (11) 2019 **Lau, H.C.P.** and Faul, U. “Anelasticity from Seismic to Tidal Timescales: Theory and Observations”, *Earth and Planetary Science Letters*, 508: 18-29.
- (10) 2018 **Lau, H.C.P.**, Austermann, J., Mitrovica, J.X., Crawford, O., Al-Attar, D., and Latychev, K. “Inferences of Mantle Viscosity based on Ice Age Datasets: The Bias in Radial Viscosity Profiles due to the Neglect of Laterally Heterogeneous Viscosity Structure”, *Journal of Geophysics: Solid Earth*, 123: 7237-7252
- (9) 2018 Crawford, O., Al-Attar, D., Tromp, J., Mitrovica J.X., Austermann, J., and **Lau, H.C.P.** “Quantifying the sensitivity of post-glacial sea level change to laterally varying viscosity”, *Geophysical Journal International*, 214(2): 1324-1363.
- (8) 2017 **Lau, H.C.P.**, Davis, J.L., Mitrovica J.X., Tromp, J., Al-Attar, D., Latychev, K., and Yang, H.-Y. “Using Tidal Tomography to Constrain Deep Mantle Buoyancy”, *Nature*, 551:321-326.
- (7) 2017 Wilmes, S.-B., Mattias Green, J.A., Gomez, N., Rippeth, T.P., and **Lau, H.C.P.** “Global tidal impacts of large-scale ice-sheet collapses”, *Journal of Geophysical Research: Oceans*, 122.
- (6) 2017 **Lau, H.C.P.**, Faul, U., Mitrovica, J.X., Al-Attar, D., Tromp, J., and Garapic, G. “Anelasticity across Seismic and Tidal Timescales: a Self-Consistent Approach”, *Geophysical Journal International*, 208(1): 368-384.
- (5) 2016 Hay, C.C., **Lau, H.C.P.**, Gomez, N., Austermann, J., Powell, E., Mitrovica, J.X., Latychev, K., and Wiens, D. “Sea-level fingerprints in a region of complex Earth structure: The case of WAIS”, *Journal of Climate*, 30(6): 1881-1892.
- (4) 2016 **Lau, H.C.P.**, Mitrovica, J.X., Austermann, J., Crawford, O., Al-Attar, D., and Latychev, K. “Inferences of Mantle Viscosity Based on Ice Age Datasets: I. Radial Structure”, *Journal of Geophysical Research: Solid Earth*, 121: 6991-7012.
- (3) 2016 Goldberg, S., **Lau, H.C.P.**, Mitrovica, J.X., and Latychev, K. “The Timing of the Black Sea Flood Event: Insights from Modeling of Glacial Isostatic Adjustment”, *Earth and Planetary Science Letters* 452: 178-184.
- (2) 2015 **Lau, H.C.P.**, Yang, H.-Y., Tromp, J., Mitrovica, J.X., Latychev, K., and Al-Attar, D., “A normal mode treatment of semi-diurnal body tides on an aspherical, rotating and anelastic Earth”, *Geophysical Journal International* 202(2): 1392-1406.
- (1) 2015 Davies, D.R., Goes S., **Lau, H.C.P.** “Thermally Dominated Deep Mantle LLSVPs: A Review” in “The Earth’s Heterogeneous Mantle: A Geophysical, Geodynamical, and Geochemical Perspective”. Khan, A., Deschamps, F. (Eds). Springer International Publishing.

\* yet to be published