

# Dr. Sophia K.V. Hines

Woods Hole Oceanographic Institution  
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## EDUCATION

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**California Institute of Technology** 2011–2018

Ph.D. in Geochemistry, Division of Geological and Planetary Sciences

Thesis title: “Glacial Ocean Dynamics: Insight from Deep-Sea Coral Reconstructions and A Time-Dependent Dynamical Box Model”

Advisor: Jess Adkins

**Carleton College** 2007–2011

B.A. in Chemistry, *Magna cum laude*

## PROFESSIONAL APPOINTMENTS

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**Woods Hole Oceanographic Institution** April 2021–present

Assistant Scientist, Department of Marine Chemistry & Geochemistry

**Lamont-Doherty Earth Observatory of Columbia University** April 2018–March 2021

Lamont Postdoctoral Research Fellowship

**California Institute of Technology** Nov. 2017–March 2018

Postdoctoral researcher in Global Environmental Science

## PEER-REVIEWED PUBLICATIONS

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1. A. Cartagena-Sierra, M. A. Berke, R. S. Robinson, B. Marcks, I. S. Castañeda, A. Starr, I. R. Hall, S. R. Hemming, L. J. LeVay, **Expedition 361 Scientific Party**, Variations in latitudinal migrations of the subtropical front at the Agulhas Plateau through the mid-Pleistocene Transition, *Paleoceanography and Paleoclimatology*, (2021).
2. A. K. Taylor, M. A. Berke, I. S. Castañeda, A. Koutsodendris, H. Campos, I. R. Hall, S. R. Hemming, L. J. LeVay, **Expedition 361 Scientists**, Plio-Pleistocene continental hydroclimate and Indian Ocean sea surface temperatures at the southeast African margin, *Paleoceanography and Paleoclimatology* (2021).
3. A. Starr, I. R. Hall, S. Barker, T. Rackow, X. Zhang, S. R. Hemming, H. J. L. van der Lubbe, G. Knorr, M. A. Berke, G. R. Bigg, A. Cartagena-Sierra, F. J. Jiménez-Espejo, X. Gong, J. Gruetzner, N. Lathika, L. J. LeVay, R. S. Robinson, M. Ziegler, **Expedition 361 Scientific Party**, Antarctic icebergs reorganize ocean circulation during Pleistocene glacials, *Nature* (2021).
4. A. Koutsodendris, K. Nakajima, S. Kaboth-Bahr, M. A. Berke, A. M. Franzese, I. R. Hall, S. R. Hemming, J. Just, L. J. LeVay, J. Pross, R. S. Robinson, **IODP Expedition 361 Scientists**, A Plio-Pleistocene (c. 04 Ma) cyclostratigraphy for IODP Site U1478 (Mozambique Channel, SW Indian Ocean): Exploring an offshore record of paleoclimate and ecosystem variability in SE Africa, *Newsletters on Stratigraphy* (2020).
5. **S. K. Hines**, J. M. Eiler, J. R. Southon, and J. F. Adkins, Dynamic intermediate waters across the late glacial revealed by paired radiocarbon and clumped isotope temperature records, *Paleoceanography and Paleoclimatology* (2019).

6. A. F. Thompson, **S. K. Hines**, and J. F. Adkins, A Southern Ocean mechanism for climate transients through the last glacial, *Journal of Climate* (2019).
7. **S. K. Hines**, A. F. Thompson, and J. F. Adkins, The role of the Southern Ocean in abrupt transitions and hysteresis in glacial ocean circulation, *Paleoceanography and Paleoclimatology* (2019).
8. J. Gruetznier, F. J. Jimenez Espejo, N. Lathika, G. Uenzelmann-Neben, I. R. Hall, S. R. Hemming, L. J. LeVay, and **the Expedition 361 Scientists**, A New Seismic Stratigraphy in the Indian-Atlantic Ocean Gateway Resembles Major Paleo-Oceanographic Changes of the Last 7 Ma, *Geochemistry, Geophysics, Geosystems*, (2019).
9. D. N. Tanguana, K.-H. Baumann, J. Just, L. J. LeVay, S. Barker, L. Brentegana, D. De Vleeschouwer, I. R. Hall, S. Hemming, R. Norris, **the Expedition 361 Shipboard Scientific Party**, The last 1 million years of the extinct genus *Discoaster*: Plio-Pleistocene environment and productivity at Site U1476 (Mozambique Channel), *Palaeogeography, Palaeoclimatology, Palaeoecology*, (2018).
10. X. T. Wang, D. M. Sigman, M. G. Prokopenko, J. F. Adkins, L. F. Robinson, **S. K. Hines**, J. Chai, A. S. Studer, A. Martinez-Garcia, G. H. Haug, Deep-sea coral evidence for lower Southern Ocean surface nitrate concentrations during the last ice age, *PNAS*, (2017).
11. T. Struve, T. van de Flierdt, L. F. Robinson, L. I. Bradtmiller, **S. K. Hines**, J. F. Adkins, M. Lambelet, K. C. Crocket, K. Kreissig, B. Coles, M. E. Auro, Neodymium isotope analyses after combined extraction of actinide and lanthanide elements from seawater and deep-sea coral aragonite, *Geochemistry, Geophysics, Geosystems*, (2015).
12. **S. K. Hines**, J. R. Southon, J. F. Adkins, Time series of radiocarbon in Southern Ocean intermediate water for the past 30,000 years, *Earth and Planetary Science Letters*, (2015).
13. S. Bush, G. M. Santos, X. Xu, J. Southon, N. Thiagarajan, **S. K. Hines**, J. F. Adkins, Simple, rapid and cost effective: A screening method for  $^{14}\text{C}$  analysis of small carbonate samples, *Radio-carbon*, (2013).

## PUBLICATIONS IN REVIEW AND IN PREPARATION

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1. T. Struve, D. J. Wilson, **S. K. V. Hines**, J. F. Adkins, T. van de Flierdt, Enhanced Tasman Leakage during the last glacial period, *Nature Communications*, (*in revision*).
2. **S. K. Hines**, L. Bolge, S. L. Goldstein, C. D. Charles, I. R. Hall, S. R. Hemming, Little change in ice age water mass structure from Cape Basin benthic neodymium and carbon isotopes, *Paleoceanography and Paleoclimatology*, (*in review*).
3. F. J. Pavia, C. S. Jones, and **S. K. Hines**, Geometry of the Meridional Overturning Circulation at the Last Glacial Maximum, *Journal of Climate*, (*in review*).
4. S. Barker, A. Starr, J. van der Lubbe, A. Doughty, G. Knorr, S. Conn, S. Lordsmith, L. Owen, S. Hemming, I. Hall, L. LeVay, and **the IODP Exp. 361 Shipboard Scientific Party**, Persistent influence of precession on northern ice sheet variability since the early Pleistocene, *Science*, *submitted*.
5. B. Pasquier, **S. Hines**, H. Liang, Y. Wu, S. John, and S. Goldstein, GNOM v1.0: An optimized steady-state model of the modern marine neodymium cycle, *Geoscientific Model Development*, *submitted*.
6. E. Anagnostou, C. J. Somes, **S. K. Hines**, M. P. Hain, J. Adkins, M. Frank, R. Sherrell, Southern Ocean subsurface nutrient depletion during the last ice age, (*in revision*).

## NON-PEER-REVIEWED PUBLICATIONS

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I. R. Hall, S. R. Hemming, L. J. LeVay, and **the Expedition 361 Scientists**, 2017. South African Climates (Agulhas LGM Density Profile). Proceedings of the International Ocean Discovery Program, 361: College Station, TX (International Ocean Discovery Program).

## GRANTS AND FELLOWSHIPS

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NSF P2C2 Award: “Collaborative Research: Vertical gradients in Southern Ocean radiocarbon across the major climate transitions of the last 30 ka”, Co-PI 2019

Lamont Postdoctoral Research Fellowship 2018

Caltech nominee for the Schmidt Science Fellowship 2017

NOSAMS Graduate Student Fellowship-Woods Hole Oceanographic Institute 2013

## FIELD EXPERIENCE

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R/V JOIDES Resolution—IODP Expedition 361 2016

## INVITED SEMINARS

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US CLIVAR Task Team 5: Paleo AMOC Seminar 2021

Department Seminar, Max Planck Institute for Chemistry 2021

Ocean Circulation and Climate Dynamics Colloquium, GEOMAR 2021

Department of Marine Chemistry and Geochemistry, WHOI 2020

Department of Earth and Planetary Sciences Seminar, American Museum of Natural History 2020

Department of Atmospheric and Environmental Sciences Seminar, University at Albany 2020

Department of Earth and Planetary Science Seminar, UC Berkeley 2020

Department of Geosciences Seminar, Penn State University 2019

Environmental Geology & Geochemistry Seminar, Princeton University 2019

Geology and Geophysics seminar, WHOI 2018

Atmosphere, Ocean, and Climate Sack Lunch Seminar, MIT 2018

Guest seminar at University of Washington Department of Oceanography 2017

Lamont-Doherty Earth Observatory Geochemistry seminar 2016, 2017

UC Berkeley Isotope Geochemistry seminar 2017

University of Southern California Paleoenvironmental seminar 2016

## CONFERENCE PRESENTATIONS

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**S. K. Hines**, S. Goldstein, C. Charles, I. Hall, S. Hemming, Glacial Overturning Circulation Structure in the Cape Basin from Neodymium Isotope Measurements.

- Talk presented at Ocean Sciences in San Diego, CA (2020)
- Invited talk presented at AGU Fall Meeting (2020)

Co-convener of Ocean Sciences session: Long-term Changes of the Deep Ocean Overturning Circulation: Past and Future (2020).

**S. K. Hines**, A. M. Franzese, C. Mwinde, S. Goldstein, C. Charles, I. Hall, S. Hemming, Glacial overturning circulation structure and Agulhas Leakage from Nd isotope and K/Ar measurements in the Cape Basin, Poster, Goldschmidt Barcelona (2019)

**S. K. Hines**, A. F. Thompson, J. F. Adkins, The dynamics of abrupt transitions and hysteresis in glacial ocean circulation, Talk, Comer Climate Conference (2018).

**S. K. Hines**, J. M. Eiler, J. F. Adkins, Intermediate water temperature and radiocarbon records from the North Atlantic and Southern Ocean across the most recent glacial termination, Talk, Goldschmidt (2017).

**S. K. Hines**, J. F. Adkins, A. F. Thompson, Insight into glacial interhemispheric ocean dynamics using a time-dependent box model with realistic ocean physics, Talk, NCAR Southern Ocean Workshop (2017).

**S. K. Hines**, A. F. Thompson, J. F. Adkins, Using a time-dependent dynamical box model to understand Intermediate Water records of radiocarbon and temperature, Poster, AGU Fall Meeting (2016).

**S. K. Hines**, J. M. Eiler, J. F. Adkins, A deep-sea coral clumped isotope and radiocarbon record from Southern Ocean intermediate water spanning the most recent glacial termination.

- Talk presented at AGU Fall Meeting in San Francisco, CA (2015)
- Poster presented at ICP12 conference in Utrecht, Netherlands (2016)

**S. K. Hines**, J. R. Southon, J. F. Adkins, Time series of radiocarbon in Southern Ocean intermediate water for the past 30,000 years.

- Poster presented at Goldschmidt in Sacramento, CA (2014)
- Talk presented at IPODS conference in Bern, Switzerland (2014)

## TEACHING AND MENTORING EXPERIENCE

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Mentor to LDEO Undergraduate Summer Intern Mollie Passacantando (Rutgers)	2019
Guest lectures at Columbia in 'Introduction to Terrestrial Paleoclimate' and 'Southern Ocean Overturning Circulation'	2018
Participated in 'Principles of University Teaching and Learning in STEM' course at Caltech	2017
Marine Geochemistry TA for Prof. Jess Adkins	2015
Paleoceanography TA for Prof. Jess Adkins	2014

## DIVERSITY, EQUITY AND INCLUSION EFFORTS

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Participant in the Unlearning Racism in Geoscience (URGE) course	2021
Participant and discussion leader for the Lamont Gender and Diversity Coffee Hour	2018–2020
Member of the Lamont Professional Conduct Committee	2018–2020

## OUTREACH

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American Museum of Natural History EarthFest exhibit with link to the JOIDES Resolution	(2019)
Volunteer at the Intrepid Museum Kid's Week	(2019)
Volunteer at Lamont-Doherty Earth Observatory Open House	(2018)
Helped organize Caltech Division Geological and Planetary Sciences booth at the Los Angeles March for Science	(2017)
Led tours for school groups through Caltech Center for Teaching, Learning and Outreach	
- Linde-Robinson Building Coelostat tour for middle school group and high school Astronomy club	(2017)
- Pi-day presentations on deep ocean and cave research for a group of third-graders and middle school girl scouts	(2017)
Led lab tours for high school students from Pasadena	(2015)
Co-taught seminar on the ocean and climate change for a group of Kindergarten students	(2013)