

ALEX KINSELLA
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Academic Appointments

2021-PRESENT **Woods Hole Oceanographic Institution**
Postdoctoral Investigator, Mahadevan Group

Education

2015-21 **UC Santa Barbara**
Ph.D. Physics, June 2021
Advisor: David R. Morrison
Dissertation Title: M-Theory and Heterotic String Theory on Special Holonomy Fibrations
M.A. Physics, May 2018

2011-15 **Stanford University**
B.S. Mathematics and Physics (with distinction and physics departmental honors)
Honors Thesis Advisor: Sean Hartnoll
Honors Thesis Title: No Negative Modes About the Axionic Wormhole Instanton
Six quarters of geophysics research in earthquake propagation modeling and observation,
mentored by Professors Eric Dunham and Simon Klemperer

Peer-Reviewed Publications

Author ordering in high energy theoretical physics is alphabetical by last name

In prep. A. Kinsella and A. Mahadevan. “Bay of Bengal Climatological Monsoon Intraseasonal Oscillations and Meridional SST Gradients.” In prep.

2021 B. Acharya, A. Kinsella, and D. Morrison. “Non-perturbative heterotic duals of M-theory on G_2 orbifolds.” *Journal of High Energy Physics*. doi.org/10.1007/JHEP11(2021)065

2021 B. Acharya, A. Kinsella, and E. Eik Svanes. “ T^3 -invariant heterotic Hull-Strominger solutions.” *Journal of High Energy Physics*. doi.org/10.1007/JHEP01(2021)197

2018 S. B. Giddings and A. Kinsella. “Gauge-invariant observables, gravitational dressings, and holography in AdS.” *Journal of High Energy Physics*. doi.org/10.1007/JHEP11(2018)074

Other Publications

2022 A. Kinsella. “Finding Nature at Sea During NASA’s S-MODE Field Campaign.” Invited blog post for NASA Earth Expeditions. <https://blogs.nasa.gov/earthexpeditions/2022/11/03/finding-nature-at-sea-during-nasas-s-mode-field-campaign/>

Grants, Fellowships, and Awards

2022-23	Francis E. Fowler IV Postdoctoral Investigator Award (\$196,798) <i>To support research on freshwater feedbacks in the South Asian monsoon</i>
2020-21	UC Santa Barbara National Science Foundation Extension Fellowship (\$24,000)
2017-21	Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics <i>Multi-year research stipend and travel funding for international conferences</i>
2015-20	National Science Foundation Graduate Research Fellowship (\$102,000)
2015	Award for Excellence in Honors Thesis Presentation, Stanford Oral Communication Program (\$350)
2013	Stanford Vice Provost for Undergraduate Education Major Grant (\$6,000) <i>To support research on the effect of fault roughness on radiation patterns of earthquakes</i>
2012	Best Poster Presentation, Stanford Earth Science Undergraduate Research Program
2010	Manson Scholar, The Bay School of San Francisco <i>Awarded by the faculty and administration for intellectual merit, commitment to the school's values, and leadership in the school community. Included a full four-year college scholarship.</i>

Selected Presentations

2023	Submesoscale Ocean Dynamics: Theory and Progress from Recent Observational Campaigns. Invited talk at International Center for Theoretical Sciences, March 2023
2023	Meridional SST Gradients and Intraseasonal Rainfall Variability in the Bay of Bengal. Invited talk at the Indian Institute for Tropical Meteorology, March 2023
2022	Monsoon Dynamics and the Ocean: The Relationship between SST Gradients and Rainfall in Monsoon Intraseasonal Oscillations. Invited talk at the SMAST Fisheries and Oceanography Seminar, November 2022
2022	CALYPSO 2022 Meteorology and Inertial Divergence Modeling. Talk at the CALYPSO DRI Meeting, September 2022
2022	The Effect of Bay of Bengal Freshwater Flux on Indian Summer Monsoon Rainfall in a Coupled Column Model. Poster Presentation at Atmospheric and Oceanic Fluid Dynamics Meeting, June 2022
2022	Monsoon Dynamics and the Ocean. Talk at the WHOI PO Seminar, June 2022
2022	Northern Indian Ocean SST Gradients and Monsoon Intraseasonal Oscillations. Poster presentation at the CLIVAR Pattern Effect Workshop, May 2022
2021	Freshwater Feedbacks on the Indian Monsoon. Talk at the WHOI Postdoc Symposium, November 2021
2021	Freshwater Feedbacks on the Indian Monsoon. Talk at the MISO-BoB Annual PI Meeting, October 2021
2021	A Journey from String Theory to Oceanography. Invited talk at Sonoma State University <i>What Physicists Do</i> Seminar, October 2021

- 2021 **String Theory, the Biological Pump, and Modes of the Santa Barbara Channel.** Invited talk at the Mahadevan Lab Group Meeting, January 2021
- 2019 **Heterotic Duals of M-Theory on Joyce Orbifolds.** Talk at the Simons Collaboration Meeting on *Physics and Special Holonomy*, Kavli Institute for Theoretical Physics, April 2019
- 2017 **Diffeomorphism-Invariant Bulk Observables in AdS.** Talk at Pacific Coast Gravity Meeting, UC Santa Barbara, March 2017
- 2013 **Fully Coupled Models of (Idealized) Buildings and Seismic Waves from Earthquakes.** Poster at 2013 Southern California Earthquake Center Annual Meeting, Palm Springs, CA
- 2012 **Rapid Lateral Variation of Seismic Anisotropy in the Salton Trough, Southern California.** Poster at 2012 American Geophysical Union Fall Meeting, San Francisco, CA
- 2016-20 UCSB Internal Seminars
Physics of the Ocean and Climate, May 2020
Seiberg-Witten Theory and 4-Manifolds, February 2019
The Supersymmetric Proof of the Index Theorem, May 2018
The Category of Topological B-Branes, February 2018
BRST, Gauge Theory, and Cohomological Field Theory, January 2018
The Kodaira Embedding Theorem, November 2017
Mirror Symmetry for G_2 Manifolds from Dual Tops, November 2017
D-Branes and Matrix Theory, October 2017
The A- and B-Model Topological Field Theories, May 2017
The Virasoro Algebra, January 2017
Lattice Gauge Theories, October 2016

Teaching and Mentorship Experience

- 2022-Present **Public School Volunteering**
 -WHOI Broader Impacts Group: Guest class on oceans and climate change for 8th graders at Keith Middle School, New Bedford.
 -Falmouth VIPS Program (Volunteers In Public Schools). Weekly volunteer physics tutoring.
- 2019-20 **Teaching assistant**, UC Santa Barbara Physics Department
 Physics 219: Statistical Mechanics (Winter 2020)
 Physics 210A: Electricity and Magnetism (Winter 2020)
 Physics 101: Complex Analysis (Spring 2019)
- 2015 **Residential counselor**, Stanford Pre-Collegiate Studies
Ten week program in which I tutored high school students in special relativity, quantum mechanics, and number theory
- 2014-15 **Tutor**, Stanford University Mathematics Organization
Linear algebra, multivariable calculus, and differential equations
- 2013 **Counselor**, Women in Physics Program, Stanford Society of Physics Students
Events for freshman women interested in physics and physics demonstrations for local Girl Scouts

Field Work Experience

- 2023 **Native Plant Trust Plant Conservation Volunteer**
- 2022 **S-MODE** (Submesoscale Ocean Dynamics Experiment): 25 day research cruise aboard R/V Bold Horizon in the eastern Pacific. Responsible for adaptive sampling navigation, uCTD operations, weather forecasting, and data flow.
- 2022 **CALYPSO** (Coherent Lagrangian Pathways from the Surface Ocean to Interior): 23 day research cruise aboard R/V Pourquoi Pas? in the western Mediterranean. Responsible for uCTD operations, weather forecasting, and organization of daily seminar.

Service

- 2023-Present WHOI Postdoctoral Association At-Large Representative
Committees: Sustainability Task Force, Workplace Climate Committee, Physical Oceanography Website Committee
- 2022-Present Peer reviewed for Journal of Climate, Journal of Geophysical Research: Oceans, and Journal of Climate.
- 2021-Present Organizer of the WHOI Monthly Monsoon Meeting
- 2022 Co-Organizer of the CALYPSO DRI Meeting
- 2019-20 Organizer of the UC Santa Barbara High Energy Grad Seminar
- 2017-18 Co-Organizer of the UC Santa Barbara Mathematical Physics Seminar

Memberships

- American Physical Society (APS)
- American Geophysical Union (AGU)
- American Meteorological Society (AMS)
- Various conservation organizations: National Audubon Society, Mass Audubon, Native Plant Trust, Association to Preserve Cape Cod, Botanical Club of Cape Cod and the Islands, The 300 Committee Land Trust
- 2017-21 Simons Collaboration for Special Holonomy in Geometry, Analysis, and Physics