ALEX KINSELLA

Department of Physical Oceanography
Woods Hole Oceanographic Institution
MS 29, Clark Laboratory, Woods Hole, MA 02543
alex.kinsella@whoi.edu
Webpage: kinsella.earth

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

Publications

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

In prep. A. Kinsella, G. Spiro Jaeger, and A. Mahadevan. "Effect of Bay of Bengal Meridional Sea Surface Temperature Gradients on Monsoon Intraseasonal Oscillations." 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

Grants, Fellowships, and Awards

2022-23 Francis E. Fowler IV Postdoctoral Investigator Award ($196,798)
To support research on freshwater feedbacks in the South Asian monsoon

2020-21 UC Santa Barbara National Science Foundation Extension Fellowship ($24,000)

2017-21 Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics
Multi-year research stipend and travel funding for international conferences

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)
To support research on the effect of fault roughness on radiation patterns of earthquakes

2012 Best Poster Presentation, Stanford Earth Science Undergraduate Research Program

2010 Manson Scholar, The Bay School of San Francisco
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.

Selected Presentations

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 *What Physicists Do* 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 **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

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 Pourquois Pas? in the western Mediterranean. Responsible for uCTD operations, weather forecasting, and organization of daily seminar.

Service

2022-Present Peer reviewed for Journal of Climate and Journal of Geophysical Research: Oceans

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

Association for the Sciences of Limnology and Oceanography (ASLO)

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