

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- **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

Preprint B. Acharya, A. Kinsella, and D. Morrison. “Non-Perturbative Heterotic Duals of M-Theory on G_2 Orbifolds.” <https://arxiv.org/abs/2106.03886>

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

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

- 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

- 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

Service

- 2019-20 Organizer of the UC Santa Barbara High Energy Grad Seminar
2017-18 Co-Organizer of the UC Santa Barbara Mathematical Physics Seminar

Skills

Extensive graduate-level coursework in oceanography, physics, and mathematics
Relevant graduate-level coursework for oceanography: physical oceanography, ocean-atmosphere dynamics, ocean modeling, biogeochemistry, numerical methods, climate modeling, chemical oceanography, geological oceanography, fluid mechanics, computational fluid dynamics, seismology

Experience with numerical model operation and output: ocean circulation inverse models, Regional Ocean Modeling System (ROMS), CESM, earthquake propagation modeling

Experience with retrieving and analyzing large datasets: North American Mesoscale Forecast System (NAM), World Ocean Atlas (WOA), Global Ocean Data Analysis Project for Carbon (GLODAP), National Data Buoy Center (NDBC), Estimating the Circulation and Climate of the Ocean (ECCO), LLC 4320

Experience with geophysical data analysis: time series analysis, spectral methods, mode decompositions, earthquake moment tensor solutions

Proficiency in Matlab, Mathematica, Python. Experience with Java, Fortran.

Experience with numerical solution of nonlinear partial differential equations

Memberships

- 2017-21 Simons Collaboration for Special Holonomy in Geometry, Analysis, and Physics
Association for the Sciences of Limnology and Oceanography (ASLO)
American Physical Society (APS)
American Geophysical Union (AGU)

Broader Interests and Activities

Birdwatching

Member of National Audubon Society, Santa Barbara Audubon Society, Mass Audubon

Men's artistic gymnastics

Member of UC Santa Barbara Gymnastics Club and National Intercollegiate Association of Gymnastics Clubs

Backpacking and hiking

Completed Wilderness First Responder certification and a 23-day outdoor leadership course