

Ocean and Earth EM Laboratory  
Institute for Geophysics  
Jackson School of Geosciences  
The University of Texas at Austin

## ACADEMIC POSITIONS

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2024 – present	<b>Research Assistant Professor</b> , Head of the Ocean and Earth Electromagnetic Laboratory, Institute for Geophysics, Jackson School of Geosciences, The University of Texas at Austin
2023 – present	<b>Guest Investigator</b> , Geology & Geophysics, Woods Hole Oceanographic Institution
2022 – 2023	<b>Research Associate</b> , Institute for Geophysics, Jackson School of Geosciences, UT Austin
2022	<b>Research Associate III</b> , Geology & Geophysics, Woods Hole Oceanographic Institution
2020 – 2022	<b>Research Affiliate Faculty</b> , School of Ocean and Earth Science and Technology, Institute of Geophysics and Planetology, Department of Earth Sciences, University of Hawai'i
2021	<b>Visiting Scientist</b> , Earth and Planetary Sciences, Weizmann Institute of Science
2018 – 2020	<b>Postdoctoral Research Fellow</b> , School of Ocean and Earth Science and Technology, Department of Earth Sciences, University of Hawai'i

## EDUCATION

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2013 – 2017	Ph.D., Geophysics, University of Southampton, National Oceanography Centre, UK
2012 – 2013	MRes., Geology & Geophysics, University of Southampton, UK
2000 – 2003	B.Sc., Oceanography (Magna Cum Laude), Ruppin College, IL

## RESEARCH SUMMARY & THEMES

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My research focuses on dynamic oceanic Earth processes, emphasizing *geohazards* and *renewable resources* originating from the upper mantle to the ultra-shallow crust. I am particularly interested in studying lithosphere-biosphere feedback interactions using advanced marine electromagnetic (EM) imaging augmented by seismic and potential field methods integrated with rock physics modeling and oceanographic/biogeochemical data. My lab ([OCEEMlab](#)) pioneers next-generation marine EM technologies to rigorously characterize hydrothermal mineralization and geo-hydrogen processes at spreading ridges and subduction zones, monitor subsea CCS, and map renewable submarine freshwater systems. OCEEMlab is dedicated to supporting the global energy transition and advancing the burgeoning [New Blue Economy](#).

- Dynamics of melting ice sheets, isostatic rebound, and methane contributions to the ocean carbon cycle
- Role of subduction zone-driven slab rollback and toroidal/poloidal mantle flows in continental breakup
- Geological hydrogen generation and storage beneath ultraslow-spreading and subduction zones
- Convection dynamics of upwelling hot plumes and cold downwelling mantle curtains
- Interplay between volcanic plumes, groundwater flux, and marine biodiversity
- Quasi-periodic earthquake cycles of oceanic transform faults
- Onshore-offshore hydraulic functioning of submarine freshwater
- Hydrothermal circulation and seafloor mineralization
- Time-lapse monitoring of subsea CO<sub>2</sub> storage sites

## RESEARCH GRANTS

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2025 – 2028	NSF (OPP) #2245625: <a href="#">ICEFLAME</a> Dynamics of melting ice sheets, isostatic rebound, and methane transformation in West Antarctica: Impacts on Southern Ocean carbon cycle. Pending: \$870,041
2024 – 2027	NSF (OCE-HS)-BSF #2320020: <a href="#">ESCAPE</a> Analyzing the hydraulic functioning of connected onshore-offshore freshened groundwater reserves. Pending: \$842,080
2024 – 2027	NSF (OCE-HS) #2402220: <a href="#">INTERFACE</a> Characterizing the fresh-saltwater interface of submarine aquifers. Pending: \$342,651
2018 – 2021	NSF (EPSCoR) #1557349: <a href="#">IKEWAI</a> Submarine freshwater mapping offshore Hawai'i. Past grant: \$240,000

## PUBLICATIONS

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\* *h-index*: 11, of peer-reviewed publications: 12, # of citations: 582 (Google Scholar, 05.06.2024)

### In Process

Chesley, C., R. L. Evans., J. Warren., **E. Attias.**, A. Gase., P. Koenig., J. Perez., C. Armerding., B. Fluegel., N. Hummel., J. D. Kim., K. Enright, E. Topp-Johnson., H. Brewer., M. Boettcher., *Nat. Geo., in-revision*. Off-axis melt influences earthquake barrier zone occurrence at oceanic transform faults.

### 2024

Yilo, K. N., K. Weitemeyer., T. A. Minshull., **E. Attias.**, H. M-Moreno., I. F-Suarez., R. Gehrman., and J. Bull, (2024). Marine CSEM synthetic study to assess the detection of CO<sub>2</sub> escape and saturation changes within a submarine chimney connected to a CO<sub>2</sub> storage site. *Geophys. J. Int.*, 236(1), 183–206.

### 2023

Haroon, A., H. Paasche., S. Graber., S. Petersen., **E. Attias.**, M. Jegen., R. Gehrman., S. Hölz., and M. Klischies, (2023). Automated seafloor massive sulfide detection through integrated image segmentation and geophysical data analysis: Revisiting the TAG hydrothermal field. *Geochem. Geophys. Geosyst.*, 24(12), e2023GC011250.

### 2021

**Attias, E.**, S. Constable., D. Sherman., K. Ismail., C. Shuler., and H. Dulai, (2021). Marine electromagnetic imaging and volumetric estimation of freshwater plumes offshore Hawai'i. *Geophys. Res. Lett.*, 48(7), e2020GL091249.

### 2020

**Attias, E.**, D. Thomas., D. Sherman., K. Ismail., and S. Constable, (2020). Marine electrical imaging reveals novel freshwater transport mechanism in Hawai'i, *Sci. Adv.*, 6, 48, eabd4866.

**Attias, E.**, K. Amalokwu, M. Watts, I. Falcon-Suarez, L. North, H. Gaowei, A. I. Best, K. Weitemeyer and T. A. Minshull, (2020). Gas hydrate quantification at a pockmark offshore Norway from joint effective medium modeling of resistivity and seismic velocity. *Mar. Petrol. Geol.*, 113, 104–151.

### 2018

**Attias, E.**, K. Weitemeyer, S. Hölz, Samer Naif, T. A. Minshull, A. I. Best, M. Jegen-Kulcsar, and C. Berndt, (2018). High-resolution resistivity imaging of marine hydrate structures by combined inversion of CSEM towed and ocean-bottom receiver data. *Geophys. J. Int.*, 214(3), 1071–1714.

Haroon, A., S. Hölz, M. Watts, R. Gehrman, **E. Attias**, M. Jegen-Kulcsar, T. A. Minshull and B. Murton, (2018). Marine dipole–dipole controlled-source electromagnetic and coincident-loop transient electromagnetic experiments to detect seafloor massive sulphides: effects of three-dimensional bathymetry. *Geophys. J. Int.*, 215(3), 2156–2171.

## 2017

**Attias, E.**, R. L. Evans, J. Elsenbeck, S. Naif, and K. Key, (2017). Conductivity structure of the lithosphere-asthenosphere boundary beneath the eastern North American margin. *Geochem. Geophys. Geosyst.*, 18(2), 676–696.

## 2016

**Attias, E.**, K. Weitemeyer, T. A. Minshull, A. I. Best, M. Sinha, M. Jegen-Kulcsar, S. Hölz, and C. Berndt, (2016). Controlled–source electromagnetic and seismic delineation of sub-seafloor fluid flow structures in a gas hydrate province, offshore Norway. *Geophys. J. Int.*, 216(2), 1093–1110.

\* Peer-reviewed publications in *Molecular Genetics* research:

## 2009

Amir O., Amir R, Paz H, **Attias E**, Sagiv M and Lewis B, (2009). Relation between AT1R gene polymorphism and long-term outcome in patients with heart failure. *Cardiology.*, 112(2), 151–157.

## 2007

Yamin C., Amir O, Sagiv M, **Attias E**, Meckel Y, Eynon N, Sagiv M and Amir R, (2007). ACE ID genotype affects blood creatine kinase response to eccentric exercise. *J. Appl. Physiol.*, 103(6), 2057–2061.

Amir O., Amir R, Yamin C, **Attias E**, Eynon N, Sagiv M, Sagiv M and Meckel Y, (2007). The ACE deletion allele is associated with Israeli elite endurance athletes. *Exp. Physiol.*, 92(5), 881–886.

## CONFERENCES

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○ *Pending publication abstracts:*

## 2023

B. Fluegel., R. L. Evans., **E. Attias.**, D. Sherman., C. Chesley., N. Hummel., J. D. Kim., A. Gase., P. Koenig, J. Perez., C. Armerding., K. Enright., and E. T-Johnson, (2023). A Vulcan Mapping of the Gofar Transform Fault: Understanding the Effect of Porosity Structure on Seismicity Segmentation Using Active Source Marine Electromagnetic Data. *AGU Fall Meeting.*, San Francisco, USA.

Chesley, C., R. L. Evans., J. Warren., **E. Attias.**, B. Fluegel., N. Hummel., A. Gase., P. Koenig., J. D. Kim., J. Perez., C. Armerding., and K. Enright, (2023). Characterizing an earthquake rupture barrier at the Gofar oceanic transform fault using controlled-source electromagnetic data. *AGU Fall Meeting.*, San Francisco, USA.

N. Hummel., R. L. Evans., C. Chesley., B. Fluegel., J. D. Kim., **E. Attias.**, A. Gase., P. Koenig, J. Perez., C. Armerding., and E. T-Johnson, (2023). The Conductivity Structure of the Gofar Transform Fault, East Pacific Rise. *AGU Fall Meeting.*, San Francisco, USA.

## SEAGOING & LAB EXPERIENCE

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2024 **Team leader**, USA, cruise AT50-19, *R/V Atlantis*. UNOLS instrument training and calibration.

2022 **Senior geophysicist**, Japan. Seafloor minerals mapping using an AUV PlumeHunter sensor suite, *Ocean Floor Geophysics*.

- 2022 **Scientific collaborator**, cruise TN-399, *R/V Thompson*. Properties of the Gofar Transform fault zone: Using electromagnetics to map variability in structure concerning the earthquake deformation cycle. NSF-funded project. PI: *Rob L. Evans*.
- 2021 **Senior geophysicist**, Norway, *R/V Olympic Delta*. Seabed mineral exploration at mid-ocean ridge using an AUV-Self-Potential system, *Ocean Floor Geophysics*.
- 2019 **Staff scientist**, cruise SKQ201914S, *R/V Sikuliaq*. Marine EM survey of fluids in the Alaskan Megathrust. NSF-OCE 1654652. PI: *Kerry Key*.
- 2019 **Staff scientist**, cruise RR1817, *R/V Roger Revelle*. Marine EM imaging of the Hikurangi subduction zone, New Zealand. NSF-OCE 1737328. PI: *Samer Naif*.
- 2019 **Senior geophysicist**, Japan. Seafloor massive sulphide exploration using an AUV-Self-Potential system, *Ocean Floor Geophysics*.
- 2018 **Chief scientist**, cruise HP2018IW, *R/V Huki Pono*. Marine CSEM mapping of submarine freshwater offshore Hawai'i. NSF-EPSCoR 1557349.
- 2017 **Scientific consultant**, Japan. Gas hydrate 3-D marine CSEM experiment, *Ocean Floor Geophysics* in collaboration with *Scripps Institution of Oceanography*.
- 2016 **Staff scientist**, cruise JC138, *RRS James Cook*. Mineral exploration using marine CSEM at the TAG hydrothermal field, 26°N mid-Atlantic ridge. European Commission grant 604500. PI: *Bramley Murton*.
- 2016 **Field geophysicist**, cruise MGL02-16, *R/V Marcus G. Langseth*. Passive imaging of the LAB at the equatorial mid-Atlantic ridge. Natural Environment Research Council grants NE/M003507/1 and NE/K010654/1. PI's: *Catherine Rychert and Steve Constable*.
- 2015 **Field geophysicist**, Japan. Marine CSEM gas hydrate survey, *Ocean Floor Geophysics* in collaboration with *Scripps Institution of Oceanography*.
- 2011 – 2012 **ROV Pilot/Tech**, West Africa, Mediterranean Sea. Company: *Oceaneering*.
- 2008 – 2010 **Senior hydrographer**, Tanzania. Hydrographic survey at Dar Es Salaam port. Company: *EDT*.
- 2006 – 2008 **Research associate**, Israel. Wingate Institute Molecular Genetic Laboratory (see publications above).

## SUPERVISION

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### Graduate Students

*Ema L. Parker*, Jackson School of Geosciences, The University of Texas at Austin, 2023 – present

*Bailey L. Fluegel*, MIT-WHOI Joint Program & UTIG's OCEEMlab, 2023 – present

*Naima K. Yilo*, University of Southampton (informal advisor), 2018 – present

### Postdoctoral Fellows

*Dr. Ming Zhang*, Institute for Geophysics, UT Austin, 2024 – present

### Research and Tech Lab Members

*Dr. Dallas Sherman*, Marine Tech & Scientist Associate, 2024 – present

P. Eng. *Tony Wass*, Senior Subsea Engineer, 2023 – present

### Subsea Instrument Development Affiliates

P. Eng. *Nathan Ehrenholz*, NOW Subsea, 2023 – present

Res. Eng. *Max Woolsey*, University of Southern Mississippi, 2023 – present

## TEACHING

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**2023:** Electromagnetic methods in the Potential Field in Geophysics course GEO 365P/383P. Jackson School of Geosciences, UT Austin.

**2018–2021:** Marine electromagnetic exploration methods. Institute of Geophysics and Planetology, Department of Earth Sciences, University of Hawai‘i.

**2015–2017:** Applied and marine geophysics, introduction to marine geology, geophysical field methods, basin analysis, seafloor exploration and surveying, bathymetric survey (field course): data acquisition, analysis, and interpretation. University of Southampton, National Oceanography Centre.

## INVITED TALKS

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2023	University of Washington, College of the Environment, School of Oceanography
2023	Marine Seismic Research Operations Committee (MSROC) Meeting
2022	University of Texas at Austin, UTIG's 50 <sup>th</sup> Anniversary Symposium
2022	International Workshop on Offshore Freshened Groundwater Research
2022	University of Texas at Austin, Institute for Geophysics
2021	University of Bremen, Department of Geoscience, Winter Colloquium
2021	COOPERATE EM Meeting
2021	Marine Seismology Symposium
2021	Weizmann Institute of Science, Department of Earth and Planetary Sciences
2020	University of Hawai‘i, School of Ocean and Earth Science and Technology
2019	University of Southampton, National Oceanography Centre
2018	Scripps Institution of Oceanography, Marine EM laboratory consortium
2016	University of Texas at Austin, Jackson School of Geosciences

## SELECTED MEDIA COVERAGE

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**Eos – Science News by AGU** (2021): *“Deep Submarine Fresh water: A New Resource For Volcanic Islands?”*

**Tribune Herald** (2021): *“Scientific breakthrough: First images of freshwater plumes at sea taken off West Hawai‘i”*

**Honolulu Star-Advertiser** (2021): *“University of Hawaii researchers are the first to track freshwater plumes rising from the ocean floor”*

**Hawai‘i News Now** (2020): *“UH freshwater discovery raises hopes for islands worldwide”*

**New York Times** (2020): *“Hawai‘i’s Fresh Water Leaks to the Ocean Through Underground Rivers”*

**Smithsonian Magazine** (2020): *“Newly Discovered Underground Rivers Could Be Potential Solution for Hawai‘i’s Drought”*

**New Scientist** (2020): *“Huge reservoir of fresh water found beneath the sea off Hawai‘i”*

**Inverse** (2020): *“Scientists Uncover Billions of Gallons of Hidden Fresh water off Hawai‘i”*

**Earth.com** (2020): *“New discovery could provide sustainable freshwater to volcanic islands”*

**International Business Times** (2020): *“Scientists Discover Billions of Gallons of Hidden Freshwater off Hawai‘i Coast”*

**Science Alert** (2020): *“Huge Underground Reservoir of Freshwater Discovered Off The Coast of Hawai‘i”*

**Science Node** (2020): *“Under the ocean”*

**University of Hawai‘i News** (2019): *“Record-breaking survey investigates Alaskan ocean trench”*

**University of Hawai‘i News** (2019): *“Ocean sensors help UH researchers understand Hawai‘i Island aquifers”*

**AGU GeoSpace** (2014): *“Electromagnetic imaging helps scientists locate underwater methane”*

## SYNERGISTIC ACTIVITIES

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### Conference Meetings

- 2020 Primary-convener, *Imaging Earth Structures from the Surface down to the Upper Mantle with Multiple Geophysical and Geochemical Data I and II*, AGU Annual Fall Meeting.
- 2018 Co-convener, *Electromagnetic Methods Applied to Studies of Crustal and Mantle Dynamics*, 15th Annual Meeting of Asia Oceania Geosciences Society.

### Review Activities

Manuscript reviewer for *Nat. Rev. Earth Environ.*; *Geophys. Res. Lett.*; *J. Geophys. Res.*; *Geochem. Geophys. Geosyst.*; *Geophys. J. Int.*; *Geophys. Prospect.*; *Geophysics*, and abstracts for AGU and SEG Annual Meetings.

### Service: Academia & Industry

- 2023 – present: [UT Austin, Jackson School of Geosciences](#) Scientific Equipment Funding Committee – Member.
- 2024 – present: [Quantum Marine Minerals](#) Inc., Norway – Advisory board member.
- 2023: [OCEEMlab–GeoFORCE](#) BootCamp. A one-week geophysical fieldwork-driven course in partnership with the [GeoFORCE](#) Texas outreach program at UT Austin, Jackson School of Geosciences. GeoFORCE introduces high school students from underserved school districts to careers in geosciences and STEM.
- 2023 – present: [OCEEMlab–ATX](#) initiative. Serve as an academic adviser to the [ATX Science Olympiad](#) student organization at UT Jackson School of Geosciences.
- 2021: Leading the *Geophysics & Tectonics* division journal club, Department of Earth Sciences, University of Hawai‘i.
- 2018 – 2021: Mentor, undergraduate, and master students from the School of Ocean and Earth Science and Technology, University of Hawai‘i.
- 2018: Advisor, British Geophysical Association, *Postgraduate Research Meetings*, University of Southampton, UK.
- 2015 – 2017: Member, Graduate School Committee, University of Southampton, UK.
- 2014 – 2017: Member, Environmental Committee, National Oceanography Centre, Southampton, UK.
- ### Service: Community
- 2018 – 2020: Bimonthly meetings with Hawai‘ian communities to provide updates on *‘Ike Wai*.
- 2019: Mentor, Kān‘eohe Community College, Hawai‘i. The TRiO STEMulate program is an educational program to prepare low-income first-generation high school students for college.
- 2017: Facilitator, FutureLearn *Exploring Our Oceans*, massive open online course.
- 2013 – 2017: Eco-schools outreach program, National Oceanography Centre, Southampton.
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