Eitan Rapaport Bruck

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Education

UC - SAN DIEGO, SCRIPPS INSTITUTION OF OCEANOGRAPHY La Jolla, CA
Ph.D. in Geophysics August 2025 - Present

CALIFORNIA INSTITUTE OF TECHNOLOGY Pasadena, CA
Bachelor of Science in Physics, minor in History and Philosophy of Science September 2019 - June 2023

Experience

CALIFORNIA INSTITUTE OF TECHNOLOGY Pasadena, CA
Research Technician November 2023 – Present

- Working on developing a digital twin of Enceladus and simulating an orbiting interferometric synthetic aperture radar remote sensing mission for the purpose of geophysical exploration.
- Advisor: Professor Mark Simons

CALIFORNIA INSTITUTE OF TECHNOLOGY Pasadena, CA
Summer Undergraduate Research Fellowship June 2022 – September 2022

- Analyzed data from Milky-way mass galaxy formation simulations including dissipative Self-Interacting Dark Matter models. Created distributions of kinematic and spatial metrics of satellite planarity to compare to real world observations.
- Advisor: Professor Phil Hopkins

CALIFORNIA INSTITUTE OF TECHNOLOGY Pasadena, CA
Summer Undergraduate Research Fellowship June 2021 – September 2021

- Developed a high-performance Markov-Chain Monte Carlo forecasting method for novel Superconducting On-Chip Fourier Transform Spectrometer devices in the study of Sunyaev-Zeldovich distortions from galaxy clusters. Applied forecasting pipeline to study science goals of NASA's OLIMPO mission.
- Advisors: Ritoban Basu Thakur and Professor Jack Sayers.

Teaching Experience

CALIFORNIA INSTITUTE OF TECHNOLOGY Pasadena, CA
Undergraduate Teaching Assistant, Computational Physics Laboratory I & II March 2023 – June 2023

Papers and Proceedings

J. Sayers, C. Avestruz, R. Basu Thakur, E. Battistelli, E. Bulbul, F. Cacciotti, F. Columbro, A. Coppolecchia, S. Cray, G. D'Alessandro, P. de Bernardis, M. De Petris, S. Hanany, L. Lamagna, E. Lau, S. Masi, A. Paiella, G. Pettinari, F. Piacentini, **E. Rapaport**, L. Rudnick, I. Zhuravleva and J. ZuHone (2024) *OLIMPO: A balloon-borne SZE imager to probe ICM dynamics and the WHIM.* EPJ Web Conf., 293 (2024) 00049 https://doi.org/10.1051/epjconf/202429300049

Conference Presentations

Rapaport, E., & Thakur, R. B. (2022). *Forecasting galaxy cluster SZ spectro-imaging with Superconducting On-chip Fourier Transform Spectrometers*. Bulletin of the AAS, 54(6). https://baas.aas.org/pub/2022n6i139p14

Steiger, A., Thakur, R. B., Klimovich, N., Shu S., **Rapaport, E.**, et al. (2022). *Design of Optically Coupled Superconducting On-chip Fourier Transform Spectrometers for CMB Science.* Proc. SPIE PC12190, https://doi.org/10.1117/12.2650512

Honors & Awards

2025 UCSD Regents Fellowship
2022 Manit M. Limlamai SURF Fellow
2022 Hummel Gray Travel Award

Professional Development

2023 - Present *Nightingale Enceladus Geophysical Orbiter, PI: Mark Simons*
Nightingale is a NASA mission concept currently under development at JPL to study Enceladus's geodynamics and habitability using radar interferometry (InSAR) and other geophysical measurements.
Role: Research Technician Member

2025 Keck Institute for Space Studies (KISS) "Digital Twins for Solar System Exploration: Enceladus - Part II"
Team leads: Alphan Altinok (JPL), Mark Simons (Caltech), Krista Soderlund (UT Austin)
Role: Program Participant

2024 Keck Institute for Space Studies (KISS) "Digital Twins for Solar System Exploration: Enceladus"
Team leads: Alphan Altinok (JPL), Mark Simons (Caltech), Krista Soderlund (UT Austin), Eloise Marteu (JPL)
Role: Program Participant

2021 - 2023 *OLIMPO Balloon-borne Imager, PI: Shaul Hanany*
OLIMPO is a proposed Antarctic balloon-borne Sunyaev-Zel'dovich effect (SZE) imager to study gas dynamics associated with structure formation.
Role: Undergraduate Student Member

Invited Presentations, Seminars, and Colloquia

2024 Keck Institute for Space Studies (KISS) "Digital Twins for Solar System Exploration: Enceladus": Lightning Talk, *Towards an Enceladus Exploration Twin: InSAR*

2023 California Institute of Technology: SURF Seminar Day, *Analyzing Satellite Properties of Milky Way Mass Galaxies in Dissipative Self-Interacting Dark Matter Simulations*

2022 California Institute of Technology: Observational Cosmology Seminar, *A Forecasting Method for Sub-Millimeter Spectro-Imagers*

2022 California Institute of Technology: SURF Seminar Day, *High-Level Optimization of SOFTS Devices for Synchrotron and Sunyaev-Zeldovich Effect Physics*