

Rafael Cottom

r(dot)cottom(at)rutgers(dot)edu • he/him

Ph.D. Student, Fellow

Rm. 203, Wright-Rieman Laboratories, Busch Campus

INTERESTS

- RESEARCH** | Ice sheets and icy satellite interiors, terrestrial planets, and exoplanets; the evolution of surfaces, ice shells and oceans, interiors, and atmospheres; influences of geophysical and astrophysical processes and events on habitability.
- SERVICE** | Geoscience and astronomy community outreach; mentoring students.

EDUCATION

- SEP 2025 - MAY 2030 | **Rutgers University**, New Brunswick, NJ | GPA: 4.00/4.00
Ph.D., Earth and Planetary Sciences
Advisor: Lujendra Ojha
- AUG 2023 - JUNE 2025 | **University of California, Santa Cruz**, Santa Cruz, CA | GPA: 3.57/4.00
B.S., Earth Sciences (Planetary Science)
Stressing Out: Episodic Tidal Amplifications as a Mechanism for Band Formation on Europa
Thesis Advisors: Benjamin Idini & Jonathan Fortney
- SEP 2020 - MAY 2023 | **Santa Barbara City College**, Santa Barbara, CA | GPA: 3.14/4.00
A.S., Astronomy (transfer w/o degree)

RESEARCH EXPERIENCE

- AUG 2024 - JUNE 2025 | **Undergraduate Researcher**
Solar System Physics (S^2P) Group, Astronomy & Astrophysics Department, UCSC
 - Developed a simple thermal model to examine the effect of cooling on Europa's ice shell
 - Calculated ice shell time-dependent radial and tangential stress profiles (ongoing)
- JUNE 2023 - AUG 2023 | **Cosmology Research Intern**
McGill Cosmic Dawn and Hydrogen Cosmology Group
 - Modeled the distribution of neutral H in the Epoch of Reionization
- JUNE 2022 - AUG 2022 | **Astrophysics Research Intern**
Carnegie Observatories — Carnegie Astrophysics Summer Student Internship (CASSI)
 - Derived the IMF for a group of metal-poor stars by matching chemical abundance patterns with SNe models

PUBLICATIONS

- IN PREP | **Cottom, R.** & Holmbeck, E. (2026). Deriving the First Stellar Mass Function from the Light-Element Abundances of Metal-poor Stars.

HONORS & GRANTS

- 2025 | Dean's Honors List (Spring Quarter) · *University of California, Santa Cruz*
Excellence Fellowship · *Earth & Planetary Sciences, Rutgers University* (\$40,000 USD)
Eli Silver Earth & Planetary Science Opportunities Fund · *Earth & Planetary Sciences, UCSC* (\$2,000 USD)
- 2023 | Marschak Astronomy SBCC Foundation Scholarship · *Earth & Planetary Sciences, SBCC* (\$1,000 USD)
- 2022 | Neil Currie Award: Outstanding Planetary Petrologist · *Earth & Planetary Sciences, SBCC* (\$500 USD)
- TOTAL:** \$43,500 USD

PROFESSIONAL EXPERIENCE

- 2019-2023 Lead Astronomy Programs Presenter, Coordinator · *Astronomy Department & School and Teacher Services*, Santa Barbara Natural History Museum (SBMNH)
- 2023 Tutor · *Field Course: Death Valley Petrology (5 Days and 4 Nights)*, Earth and Planetary Sciences, SBCC

LEADERSHIP & OUTREACH

- 2025 Committee Lead · *Commencement A/V Committee*, Earth & Planetary Sciences, UCSC
- 2023 - 2025 Member · *Astrobiology Reading Group*, Earth & Planetary Sciences, UCSC
Member · *Cosmochemistry Reading Group*, UCSC
- 2023 - 2024 Events Coordinator · *Women in Physics and Astronomy*, UCSC
- 2021 - 2023 President, Officer · *Astronomy Club*, Earth & Planetary Sciences, SBCC
- 2019 - 2023 Organizer and observatory operator · *Monthly Star Party*, SBMNH, Santa Barbara, CA
- 2021 - 2023 Organizer and communicator · *Astronomy Club Star Parties*, Earth & Planetary Sciences, SBCC
- 2022 - 2023 Organizer and communicator · *STEM Day*, Earth & Planetary Sciences, SBCC
- 2023 Communicator · *Science Discovery Day (STEM Transfer Program)*, Earth & Planetary Sciences, SBCC
- 2022 Organizer and events host · *Astronomy Club Invited Talks, Trivia Night, etc.*, Earth & Planetary Sciences, SBCC
- Communicator · *Ask an Astronomer Table*, Carnegie Observatories, Pasadena, CA
- Communicator · *AstroFest 22 (Carnegie Observatories)*, Pasadena, CA
- Communicator · *La Cumbre Junior High School Science Night (SBCC Astronomy Club)*, Santa Barbara, CA

CONFERENCE PRESENTATIONS

Posters

- 2023 **Cottom, R.** & Holmbeck, E. (2023). Deriving the First Stellar Mass Function from the Light-Element Abundances of Metal-poor Stars. *Bulletin of the AAS*, 55(2).

OTHER PRESENTATIONS

- 2025 *Ocean Worlds and Planetary Science* · **Invited Speaker**, SBCC Astronomy Club
- 2023 *Algal Members of the Crystal Springs Formation* · **Tutor Talk**, Death Valley Petrology Field Course, SBCC
Galactic Archaeology · **Invited Speaker**, Santa Barbara Astronomical Unit: First Friday of the Month Speaker Event
Astronomy 101 · **Speaker**, Educator Training, Santa Barbara Museum of Natural History
- 2022 *Galactic Archaeology* · **Invited Speaker**, Science Pub at Dargan's, Santa Barbara Museum of Natural History
- 2022 *Galactic Archaeology* · **Invited Speaker**, SBCC Astronomy Club

MENTORING

- 2023-2026 Evan Grant · *Undergraduate*, UC Berkeley
- 2023-2026 CASSI Mentorship Program · *Undergraduates*, Carnegie Observatories Summer Student Internship

SKILLS

- LEADERSHIP** Event organizing and hosting; leading educational programs for school groups and community members; coordinating outreach; mentorship experience
- CODING** Python, R, LaTeX, DigiStar
- SOFTWARE** iSALE, ArcGIS Online, ArcMap, *Spectroscopy* (Moog, Spectroscopy Made Hard(er) (SMHr), [STARFIT](#)), Jupyter Notebook, *Reionization Modeling (21cmFAST, zreion)*, Microsoft Suite, Open Broadcast Software
- LANGUAGES** Greek (native), English (native), French (elementary)