

Nora A. Bailey, PhD

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Selected Experience:

Senior Scientist, 2023 – present

Areté, Northridge, CA

- Conduct scientific research applying principles of physics to various sensor systems and signal/image processing algorithms.
- Employ software engineering and mathematical and statistical analysis to solve key scientific and engineering challenges.
- Sole developer of a tool from concept to completion, including a GUI, to model theoretical predictions of image quality based on optical system parameters.

Teaching/Research Assistant, Astronomy and Astrophysics, 2017 – 2022

University of Chicago, Chicago, IL

- Conducted cutting-edge research in extrasolar planets, focusing on the physical dynamics of planetary systems using computer simulations.
- Published four first-author papers and presented scientific talks and conference posters.
- Provided teaching and lecture support for four undergraduate courses.
- Proficient in Python, GitHub, Linux, and high-performance computing for data generation, management, and visualization.

Associate, Project Management/Systems Engineering, 2014 – 2017

Booz Allen Hamilton, San Diego, CA, Charleston, SC

- Provided optimization and planning support to Navy/DoD clients, managing multi-million dollar budgets and leading requirements gathering for automated reporting systems.
- Utilized creative problem-solving skills and implemented efficient processes, contributing to successful re-compete of a long-term program office contract.
- Proficient in Excel, Project, and data analysis tools for program management and technical support.

Projects:

Relative Habitability of Exoplanets — [Scientific Research Project](#)

Conducted ~12 million simulations using high-performance computing to create a dataset spanning 10 dimensions. Investigated, visualized, and published the dataset for open use.

Dynamics Code Modules — [Custom Python Code](#)

Developed and documented 4 modules with 14 packages and over 60 individual functions for scientific research on dynamics during Ph.D. studies.

Skills/Tools:

Python (Matplotlib, Numpy, Pandas, Seaborn, emcee, PyQt), Jupyter Notebooks, Spreadsheets (Excel, Sheets), Data Analysis, Data Visualization, Git (GitHub, BitBucket), SQL, Jira, LaTeX, PhotoShop, PowerPoint, Scientific Writing, Public Speaking

Education:

Ph.D., Astronomy and Astrophysics, University of Chicago, Chicago, IL

- Thesis: "Planet-Planet Interactions in Exoplanet Systems"

B.S., Physics (Astrophysics track), United States Naval Academy, Annapolis, MD

- With merit; 3.92 GPA (4.0 in major)
- Minor: Spanish Language Study

Additional Experience/Education/Training:

Public Engagement Specialist, 2022 – 2023

Jet Propulsion Laboratory, Pasadena, CA

Primary communications point person for NASA's Exoplanet Exploration program.

Science Communicator, 2020 - present

Nora's Guide to the Galaxy

Content creator in the areas of space, astronomy, science, and women in STEM for an audience of 100k+ followers plus additional freelance science communication work for clients.

Video Creator, 2021-2022

Khan Academy (Contract)

Physics and space science educational videos for middle school and high school audiences.

Certified as a **Nuclear Engineer Officer** by the Departments of Energy and Defense, 2014

- One of 3 NEOs to be recognized by Naval Reactors (Admiral John M. Richardson) as excellent during examination.

Reactor Mechanical Division Officer, 2012 – 2014

United States Navy, USS Carl Vinson, CVN 70, San Diego, CA

Led a division of 20+ personnel responsible for the primary systems of an A4W nuclear reactor.

Combat Information Center Officer/Fire Control Officer/Public Affairs Officer, 2009 – 2011

United States Navy, USS Green Bay, LPD 20, San Diego, CA

Led 30+ personnel in performance of operational duties.

- Ranked first amongst peer group.

Accounting Certificate, 2016

University of California San Diego Extension, San Diego, CA

- Completed with 98% average.

Navy Prototype School, 2012

United States Navy, Charleston, SC

- Graduated #1 in class.

Navy Nuclear Power School, 2011

United States Navy, Charleston, SC

- Graduated #2 in class.

Research Publications:

Ji, X., **Bailey, N.**, Fabrycky, D., et al. "Inner Habitable Zone Boundary for Eccentric Exoplanets" 2023, [ApJL, 943, L1](#)

Bailey, N., & Fabrycky, D. "Relative Habitability of Exoplanet Systems with Two Giant Planets" 2022, [MNRAS, 514, 4765](#)

Bailey, N., Gilbert, G., & Fabrycky, D. "Period Ratio Sculpting near Second-order Mean-motion Resonances" [2022, AJ, 163, 13](#)

Bailey, N. & Fabrycky, D. "Nodal Precession in Closely Spaced Planet Pairs" [2020, AJ, 159, 217](#)

Bailey, N. & Fabrycky, D. "Stellar Flybys Interrupting Planet-Planet Scattering Generates Oort Planets" [2019, AJ, 158, 94](#)