

Cara A. Pesciotta

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EDUCATION

Johns Hopkins University, Baltimore, MD

Expected 2027

Ph.D. in Earth and Planetary Science

♦ Advisor: Sarah M. Hörst, Ph.D.

♦ Relevant Coursework: Physics and Chemistry of Aerosols, Spectroscopic Methods of Organic Structure Determination, Exoplanets and their Atmospheres, Planetary Atmospheres, Surfaces, and Interiors

Northeastern University, Boston, MA

May 2022

B.S. in Physics, Minor in Mathematics

♦ Summa Cum Laude

♦ Relevant Coursework: Advanced Astrophysical Topics, General Relativity & Cosmology, Quantum Mechanics, Thermodynamics, Modern Physics, Electricity & Magnetism, Fourier Series & PDEs, Differential Equations, Linear Algebra, Multivariable Calculus, General Chemistry with Lab

RESEARCH EXPERIENCE

Harvard-Smithsonian Center for Astrophysics, Cambridge, MA

July 2021 – Present

Undergraduate Researcher, Öberg Astrochemistry Group

♦ Lead project to understand entrapment of CO in thick H₂O and CO₂ ices by analyzing infrared and mass spectrometry data during temperature-programmed desorption

♦ Assist in building novel experimental setup designed to transport icy grain samples, problem-solving complications and making precise alignments

CERN CMS Experiment, Geneva, Switzerland

July – December 2020

Particle Physics Research Co-op, Advisor Louise Skinnari

♦ Upgraded the particle identification algorithm in the CMS L1 Track Trigger to increase efficiency and prepare for the High-Luminosity LHC

♦ Wrote and edited scripts in Python and C++ to conduct performance studies and generate plots for proton and muon collision Monte Carlo simulations

♦ Presented progress to general and technical audiences over 6 talks and collaborated with scientists from national and international institutions

MIT and Harvard University, Cambridge, MA

October 2019 – May 2022

Junior Researcher, Advisor Clara Sousa-Silva

♦ Compiled the most accurate high-temperature spectra of phosphine to use in the detection of life on other planets utilizing wavenumber and quantum number data from over 20 research papers

♦ Worked extensively with MARVEL, a program to calibrate theoretical spectra to yield high-accuracy cross-sections, Excel, and Python to analyze and standardize large data sets

KEY PUBLICATIONS & CONFERENCE PRESENTATIONS

Pesciotta, C., Simon, A., Rajappan, M., Öberg, K.I. (in press). Entrapment in CO₂ and H₂O Ices: Impact of Ice Matrix Thickness. *The Astrophysical Journal*.

Pearce, B.K.D., Hörst, S.M., Cline, C.J., Cintala, M.J., He, C., Sebree, J.A., MacKenzie, S.M., Daly, R.T., Pontefract, A.J., **Pesciotta, C.** (2024) Towards Prebiotic Chemistry on Titan: Impact experiments on organic haze particles. *Planetary Science Journal*, 5, 68.

Pesciotta, C., Hörst, S.M., and He, C. *Prebiotic Chemistry from Hydrolyzing Titan and Exoplanet Haze Analogs*, talk. AbGradCon, Providence, RI. May 2024.

TEACHING EXPERIENCE

Planetary Seminar, AS.270.662, Johns Hopkins University
Teaching Assistant

Fall 2023

LEADERSHIP / ACTIVITIES / VOLUNTEER WORK

JHU EPS Outreach Committee, Baltimore, MD
Member

August 2022 – Present

- ◆ Design volunteer opportunities for members of the department to develop science communication skills by connecting with the greater Baltimore community
- ◆ Oversee content and maintenance of the department Twitter page to promote collaboration between universities and publicize departmental events and science

NUSci Magazine, Boston, MA
Writer & Editor (nuscimagazine.com/author/cara-pesciotta)

July 2019 – May 2022

- ◆ Author of 11 articles related to fields like mathematics, ecology, and astronomy both in print and online
- ◆ Edit up to 8 articles per semester, working with a variety of topics, styles, and writers to achieve best possible product

Strong Women Strong Girls, Boston, MA
Mentor and Site Leader

September 2019 – May 2022

- ◆ Organize and facilitate weekly mentoring sessions for Boston Public School girls grades 3-5
- ◆ Facilitate conversations about diversity and inclusion by presenting role models in science, sports, advocacy, and more

PROFESSIONAL AFFILIATIONS

American Geophysical Union

Division for Planetary Sciences of the American Astronomical Society

SKILLS AND INTERESTS

- ◆ Computer Programming: Familiar with Python, C++, Java, MATLAB, Mathematica, LaTeX, ROOT, Linux, MARVEL, Microsoft Excel
- ◆ Laboratory Skills: IR spectrometry, quadrupole mass spectrometry
- ◆ Interests: science communication and policy, mentoring kids, travel, hiking, baking, voice & piano