COLLIN CHERUBIM

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RESEARCH INTERESTS: I combine theory and observation to explore small-planet formation and evolution. Topics: Planetary climate, exoplanet discovery and characterization, small-planet formation and evolution, numerical modeling, atmospheric spectroscopy, atmospheric escape, magma ocean evolution, habitability, astrobiology.

EDUCATION

Harvard University – *Cambridge, MA*

- Ph.D., M.S. Earth & Planetary Science (expected May 2026)
- Origins of Life Initiative Graduate Consortium Certificate (expected May 2026)
- Advisors: Robin Wordsworth, David Charbonneau

Carnegie Mellon University – *Pittsburgh, PA*

- B.S., M.S. Chemistry with Honors (2015)
- Advisor: Bruce Armitage

RESEARCH APPOINTMENTS

Harvard Prize Graduate Fellow, Harvard University	2021 – Present
Research Scientist: Caltech, Andrew Howard's group, mentored by Lee Rosenthal	2020 – 2021
Research Scientist: Harvard, mentored by Robin Wordsworth	2020 – 2021
Honors Research Program: Carnegie Mellon, Center for Nucleic Acids Science & Technology	2013 – 2015

AWARDS & TELESCOPE TIME

Co-PI: XMM-Newton (54 hours)	2026
Episodic atmospheric escape from a habitable-zone super-Earth driven by mid-M dwarf XUV variability	
Co-PI: WINERED – Magellan Clay 6.5m (12 hours)	2025b
The WINERED Helium Consortium: Investigating the Composition and Evolution of Sub-Neptunes	
Co-PI: WINERED – Magellan Clay 6.5m (7 hours)	2024b
The WINERED Helium Consortium: Investigating the Composition and Evolution of Sub-Neptunes	
Co-I: JWST Cycle 3 GO Program (22.5 hours)	2025
A Search for Exoplanet Satellites that are the Same Size as the Earth's Moon	
Harvard Certificate of Student Recognition of Teaching	2023
Harvard James Mills Peirce Graduate Fellowship	2021
Harvard Prize Graduate Fellowship	2021
Staff Culture Award, Staff Achievement Award, Roxbury Prep High School	2018
University, college, and department honors, Carnegie Mellon University	2015
Jennings Brave Companions Award, Carnegie Mellon University	2013

PUBLICATIONS

Cherubim, C., Vissapragada, S., Charbonneau, D., et al. Escaping helium atmosphere on a terrestrial planet in a nearby habitable zone (in review at *Science*).

Cherubim, C., Wordsworth, R., Bower, D., Sossi, P., Adams, D., Hu, R. An Oxidation Gradient Straddling the Small Planet Radius Valley. *The Astrophysical Journal* (2025).

Cherubim, C., Wordsworth, R., Hu, R., Shkolnik, E. Strong Fractionation of Deuterium and Helium in Sub-Neptune Atmospheres along the Radius Valley. *The Astrophysical Journal*, 967, 2 (2024).

Cherubim, C., Cloutier, R., Charbonneau, D. et al. TOI-1695 b: A Water World Orbiting an Early-M Dwarf in the Planet Radius Valley. *The Astronomical Journal*, 165, 4 (2023).

Wordsworth, R., **Cherubim, C.** et al. Applied Astrobiology: An Integrated Approach to the Future of Life in Space. *Astrobiology*, 25, 5 (2025).

Seager, S., **Cherubim, C.** et al. The Last Liquids Flowing: Formation and Persistence of Ionic Liquids on Rocky Exoplanets with Vanishingly Thin Atmospheres (in prep).

Kuss, V., Wordsworth, R., Cmiel, J., **Cherubim, C.** Climates of rocky planets with He-dominated atmospheres (in prep).

Bischof, G., Wordsworth, R., Moores, J., **Cherubim, C.** Constraining the Composition of Rocky Exoplanet Atmospheres from Lyman-α Transit Observations (in prep).

Cloutier, R., Greklek-McKeon, M., Wurmser, S., **Cherubim, C.**, et al. Masses, revised radii, and a third planet candidate in the 'Inverted' planetary system around TOI-1266. *Monthly Notices of the Royal Astronomical Society*, 527, 3 (2024).

Cadieux, C., Plotnykov, M., Doyon, R., Valencia, D., Jahandar, F., Dang, L., Turbet, M., Fauchez, T., Cloutier, R., **Cherubim, C.**, et al. New Mass and Radius Constraints on the LHS 1140 Planets: LHS 1140 b Is either a Temperate Mini-Neptune or a Water World. *The Astrophysical Journal Letters*, 960, 1 (2024).

Dalba, P., Kane, S., Li, Z., MacDougall, M., Rosenthal, L., **Cherubim, C.** et al. Giant Outer Transiting Exoplanet Mass (GOT 'EM) Survey. II. Discovery of a Failed Hot Jupiter on a 2.7 Yr, Highly Eccentric Orbit. *The Astronomical Journal*, 162, 4 (2021).

Cherubim, C. "TEACHER VOICE: 'Which police officer will see me not as an educator or a scientist, but as a suspect?'" The Hechinger Report, 30 June, 2020.

Oyaghire, S.N., **Cherubim, C.** et al. RNA G-Quadruplex Invasion and Translation Inhibition by Antisense γ-Peptide Nucleic Acid Oligomers. *Biochemistry*, 55, 13 (2016).

PRESENTATIONS

Invited talks	
Carnegie Observatories, Pasadena	Feb 2026
University of California Santa Cruz, Planetary Lunch Seminar	Dec 2025
Harvard University, Exoplanet Pizza Lunch	Dec 2025
Lorentz Center Workshop, Leiden	Oct 2025
University of Chicago Special Seminar	Sep 2025
MIT Exoplanet Tea	May 2025
Kapteyn Institute Groningen Exoplanets Symposium	Jun 2024
Max Planck Institute for Astronomy Heidlberg, Exocoffee Meeting	Apr 2024
Contributed talks	
STScI AER Conference	Nov 2025
Exoclimes V Conference	Jul 2025
Origins of Life Initiative, Chalk Talk Lecture Series	Apr 2025
Technical University of Denmark Space, Journal Club	Mar 2025
NASA/JPL Colloquium	Jan 2025
Technical University of Denmark Space, Buchhave group	Jun 2024
Imperial College London, Escape from Exoplanets Workshop	Jun 2024
Harvard/MIT Exoplanet Scientist Gathering	Jan 2024
(Public) Exeter Science Center	Jun 2023
(Public) Harvard Natural History Museum, Science Spotlight	Mar 2023
Rocky Worlds II Conference	Jul 2022

Posters

Exoplanets V Conference — Jun 2024
Extreme Solar Systems V Conference — Mar 2024
Exoclimes VI Conference — Jun 2023
Rocky Worlds II Conference — Jul 2022
Exoplanets IV Conference — May 2022

TEACHING/MENTORING EXPERIENCE

Harvard University

- Senior Thesis Advisor (Logan Wilson, astronomy undergraduate) — Jul 2025 – May 2026
- Senior Thesis Advisor (Stephanie Yoshida, astronomy undergraduate) — Sep 2024 – May 2025
- Teaching Fellow for GENED 1184: Worlds Beyond — Spring 2025
- Teaching Fellow for GENED 1018: How To Build a Habitable Planet — Fall 2022, Fall 2023

International Tutors LLC — Jan 2023 – Present

- Founder and tutor. Working to make top education universally accessible

Harvard/MIT Science Research Mentoring Program — Sep 2021 – May 2022

- Mentored three secondary school students in year-long astro research project

Casablanca American School – Casablanca, Morocco — Aug 2019 – Aug 2021

- IB Physics Teacher/Science Department Chair
- Astrophysics research mentor

Roxbury Preparatory Charter School – Boston, MA — Aug 2016 – Aug 2019

- AP Chemistry Teacher
- Academic advisor

Carnegie Mellon University – Pittsburgh, PA

- Teaching Assistant for undergraduate chemistry lab — Jan 2015 – May 2015
- Teaching Assistant for Biological Foundations of Behavior — Aug 2011 – Dec 2011

OUTREACH & SERVICE+

Harvard Museums of Science & Culture — Dec 2021 – Present

- Science Education Partner
- Virtual Scientist in a Classroom

Harvard Science in the News — Sep 2023 – Sep 2025

- Editor-in-Chief
- Short form and long form blog writer

Harvard University — Sep 2021 – Dec 2024

- Planetary Journal Club co-organizer (Earth & Planetary Science/Center for Astrophysics)

eta Earth Science Blog — Apr 2020 – Present

- Founder, writer, editor

Brocade Studio — Apr 2024 – Feb 2025

- Data Scientist

Carnegie Mellon University — Mar 2015 – Aug 2015

- DNAZone volunteer

SKILLS

Python, MATLAB, SQL, GitHub, uv, pypi packaging, numerical modeling, machine learning, slurm, VScode, cursor, Markov chain Monte Carlo, Gaussian processes, atmospheric forward modeling, exoplanet data analysis (transit photometry, radial velocity, high-resolution ground-based atmospheric spectroscopy), research mentorship, tutoring, chemistry laboratory analysis (synthesis, fluorescence/UV/Vis spectroscopy, circular dichroism spectroscopy, mass spectrometry, nuclear magnetic resonance spectroscopy, surface plasmon resonance, nucleic acid PCR etc.)

REFERENCES

Robin Wordsworth, PhD advisor
Harvard University, Cambridge MA
Gordon McKay Professor of Environmental Science & Engineering and Professor of Earth & Planetary Sciences
rwordsworth@seas.harvard.edu

David Charbonneau, PhD advisor
Harvard University, Cambridge MA
Fred Kavli Professor of Astrophysics, Department Chair
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Evgenya Shkolnik, mentor
Arizona State University, visiting scientist at Harvard University
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Renyu Hu, mentor
NASA Jet Propulsion Laboratory, Penn State University
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