

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

NASA Hubble/Sagan Fellow, University of Chicago	(August 2026 – Present)
Chancellor’s Postdoctoral Fellowship, University of California Santa Cruz	(July 2026)
Harvard Kavli-Laukien Postdoctoral Fellow at the Origins of Life Initiative	(deferred, 2029)
Harvard Prize Graduate Fellow	2021 – 2026
Research Scientist: Caltech, Andrew Howard’s group, mentored by Lee Rosenthal	2020 – 2021
Research Scientist: Harvard, mentored by Robin Wordsworth, David Charbonneau	2020 – 2021
Honors Research Program: Carnegie Mellon, Center for Nucleic Acids Science & Technology	2013 – 2015

AWARDS & TELESCOPE TIME

Co-PI: WINERED – Magellan Clay 6.5m (12 hours)	2026b
<i>Variable atmospheric escape from a habitable-zone super-Earth</i>	
Co-PI: XMM-Newton (54 hours)	2026
<i>Episodic atmospheric escape from a habitable-zone super-Earth driven by mid-M dwarf XUV variability</i>	
Co-PI: WINERED – Magellan Clay 6.5m (12 hours)	2025b
<i>The WINERED Helium Consortium: Investigating the Composition and Evolution of Sub-Neptunes</i>	
Co-PI: WINERED – Magellan Clay 6.5m (7 hours)	2024b
<i>The WINERED Helium Consortium: Investigating the Composition and Evolution of Sub-Neptunes</i>	
Co-I: JWST Cycle 3 GO Program (22.5 hours)	2025
<i>A Search for Exoplanet Satellites that are the Same Size as the Earth’s Moon</i>	
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. Helium escaping from the atmosphere of a nearby rocky exoplanet orbiting in a habitable zone. *Science* (2026). DOI: 10.1126/science.aea9708.

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 (Accepted in ApJL).

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

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).

Abstracts

Cherubim, C., Wordsworth, R., Hu, R., Shkolnik, E. Strong fractionation of deuterium and helium in sub-Neptune atmospheres along the radius valley. *Bulletin of the American Astronomical Society*, 56, 4 (2024).

Pass, E., Bean, J., Charbonneau, D., **Cherubim, C.**, Garcia-Mejia, J. A Search for Exoplanet Satellites that are the Same Size as the Earth's Moon. JWST Cycle 3, #6193 (2024).

Cherubim, C., Cloutier, R. TOI-1695 b: a radius valley planet around a TESS early M dwarf. *Bulletin of the American Astronomical Society*, 54, 5 (2022).

Software

Cherubim, C. IsoFATE: Isotopic Fractionation via ATmospheric Escape. *Astrophysics Source Code Library*, ascl:2503.018, (2025).

Op-ed

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.

PRESENTATIONS

Invited talks

Origins of Life meeting, Zurich	Sep 2026
Seminar at ETH Zurich	Sep 2026
Evaporating Worlds: Linking Theory and Observations of Atmospheric Loss, Italy	Jun 2026
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 Heidelberg, Exocoffee Meeting	Apr 2024

Contributed talks

Exoplanets VI Conference	Jul 2026
STScI AER Conference	Nov 2025
Exoclimates 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 VI Conference	Jul 2026
Exoplanets V Conference	Jun 2024
Extreme Solar Systems V Conference	Mar 2024
Exoclimates 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

- 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
- Teaching Assistant for Biological Foundations of Behavior

Jan 2015 – May 2015

Aug 2011 – Dec 2011

OUTREACH & SERVICE+

Harvard Museums of Science & Culture

Dec 2021 – May 2026

- 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

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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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