CRAIG J. HARDGROVE

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Employment

- **2026–present** Professor, Arizona State University, School of Earth and Space Exploration
- **2022–2026** Associate Professor, Arizona State University, School of Earth and Space Exploration
- **2016–present** Director of Projects, ASU NewSpace Initiative
- **2017–present** Honors Faculty, Barrett Honors College, Arizona State University
- **2019–present** Adjunct Assistant Professor, University of Tennessee, Department of Earth and Planetary Sciences
- **2016–2022** Assistant Professor, Arizona State University, School of Earth and Space Exploration
- **2013–2016** Postdoctoral Research Scientist, Arizona State University
- **2012–2013** Assistant Staff Scientist, Malin Space Science Systems
- **2011–2012** Postdoctoral Researcher, Stony Brook University
- **2008–2011** NASA Graduate Research Program Fellow, NASA Goddard Space Flight Center and University of Tennessee

Education

- **Ph.D.**, Geology, University of Tennessee, 2011
- **B.S.**, Physics, Georgia Institute of Technology, 2004

Research Experience

My research applies gamma-ray and neutron spectroscopy to planetary surfaces, with a focus on hydrogen, water, and elemental composition on the Moon, Mars, and small bodies. I am Principal Investigator of LunaH-Map, NASA's first interplanetary CubeSat to fly a neutron spectrometer to the Moon. I am Co-Investigator and Instrument Scientist for the Gamma-Ray and Neutron Sensor (GRNS) on the NASA Lunar-VISE CLPS mission landing at the Gruithuisen Domes; Deputy PI of the Lunar Hydrogen Autonomous Neutron Detector for the Canadian Space Agency Lunar Rover Mission; Co-I on the BepiColombo Gamma-Ray and Neutron Spectrometer; Participating Scientist on the Mars Science Laboratory Curiosity Dynamic Albedo of Neutrons (DAN) instrument; and Co-I on Mars 2020 Mastcam-Z. My group develops miniaturized neutron and gamma-ray spectrometers for small spacecraft, including under a NASA-JPL Strategic Technology Research Project. Across these efforts I work with collaborators at LANL, NASA Goddard, JPL, RMD Inc., Busek, and BAE Systems, bridging university research, national labs, and the commercial space industry. I have graduated eight PhD students as primary advisor and four MS students; I currently advise two PhD students.

Key Publications

1. Williams, J.-P., Valencia, S., Bennett, K., Landis, M., Donaldson Hanna, K., Dove, A., O'Brien, P., Denevi, B., Hagerty, J., **Hardgrove, C.**, et al. (2026). Morphometric properties of the CP-21 landing site on the Moon at Mons Gruithuisen Gamma. *Planetary Science Journal*, 7(4), 78.
2. Czarnecki, S.M., **Hardgrove, C.**, Rampe, E.B., Gasda, P.J. (2026). Constraining the Hydration of Clay Minerals and Abundances of Amorphous Phases in Gale Crater, Mars. *Journal of Geophysical Research – Planets*. 2025JE009199.
3. Vydula, A.K., Coupland, D., Mesick, K., **Hardgrove, C.** (2025). Systematic uncertainties in the measurement of the neutron lifetime using the Lunar Prospector neutron spectrometer. *Physical Review C*.
4. Johnson, E.B., Weststrate, E., Frost, A., Blakeley, R., Melo, A., **Hardgrove, C.**, Mehall, G., et al. (2024). The design of the Lunar-VISE gamma-ray neutron spectrometer. *Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XXVI*, SPIE Conference Series, 13151.
5. Heffern, L.E., **Hardgrove, C.J.**, et al. (2021). Active neutron interrogation experiments and simulation verification using SINGR. *Nuclear Instruments and Methods in Physics Research A*, 1020.
6. **Hardgrove, C.**, Starr, R., Babuscia, A., et al. (2020). The Lunar Polar Hydrogen Mapper CubeSat Mission. *IEEE Aerospace and Electronic Systems Magazine*, 35(3), 54–69.

7. Rapin, W., Ehlmann, B.L., Dromart, G., …, **Hardgrove, C.**, et al. (2019). An interval of high salinity in ancient Gale crater lake on Mars. *Nature Geoscience*, 12, 889–895.

Honors

- NASA Group Achievement Awards: Mars 2020/Perseverance (2023, 2024); MSL/Curiosity Science Team (2015, 2017); MSL Operations (2013); MER Extended Missions (2004, 2005, 2008)
- NASA Early Career Fellowship Award, 2016
- Outstanding Young Alumnus Award, EPS Department, University of Tennessee, 2016
- NASA Graduate Student Researcher's Program Fellowship, 2008–2011
- Interdisciplinary Research Award, EPS Department, University of Tennessee, 2010

Professional Society Memberships

- American Geophysical Union (Planetary Sciences Section)
- The Planetary Society
- American Physical Society