

**Name:** Caitlin Ahrens

**Code:** 698

**Home institution:** University of Maryland,  
College Park

**Name of task:** Lunar polar volatiles and  
lunar volcanism

**Role in task/ what they do for CRESST:**

My work involves analysis of thermal data from the Lunar Reconnaissance Orbiter (LRO) to study lunar polar volatiles. I also work with imagery from LRO to study lunar volcanic dome morphology and model possible formation mechanisms. This work is accomplished in collaboration with my GSFC sponsor, Dr. Noah Petro.



**Background/ Autobiography:**

I have B.S. degrees in Physics (emphasis Astrophysics) and Geology from West Virginia University. I pursued my Ph.D. in Space and Planetary Science at the University of Arkansas. After defending my dissertation, I entered the NASA Postdoctoral Program (NPP) Fellowship for my postdoctoral work at NASA GSFC. In October 2023, I joined the CRESST-II team at UMD College Park.

**Favorite part of being a CRESST Scientist?**

CRESST-II has opened collaborative opportunities within the planetary science community and allows me to explore new avenues of lunar exploration, instrumentation development, and data analyses.

**Selected List of Publications:**

[Ahrens, C.](#), and R. Lena. An Effusive Lunar Dome Near Fracastorius Crater: Spectral and Morphometric Properties *Remote Sensing* 14 (23): 6135 [[10.3390/rs14236135](#)]

[Ahrens, C.](#), H. Meraviglia, and C. Bennett. A Geoscientific Review on CO and CO<sub>2</sub> Ices in the Outer Solar System *Geosciences* 12 (2): 51 [[10.3390/geosciences12020051](#)]

Williams, J., [B. T. Greenhagen](#), K. A. Bennett, *et al.* D. A. Paige, N. Kumari, [C. J. Ahrens](#), L. Rubanenko, T. M. Powell, P. Prem, D. T. Blewett, P. S. Russell, P. O. Hayne, and M. T. Sullivan. Temperatures of the Lacus Mortis region of the Moon *Earth and Space Science* [[10.1029/2021ea001966](#)]

[Ahrens, C.](#), V. Cataldo, and G. Leone. Volcanic eruptions on Mars and lava flow morphology and thermodynamics *Mars: A Volcanic World*

Umurhan, O., [C. Ahrens](#), and V. F. Chevrier. Rheological and Thermophysical Properties and Some Processes Involving Common Volatile Materials Found on Pluto's Surface *The Pluto System After New*

*Horizons* (S. A. Stern, J. M. Moore, W. M. Grundy, L. A. Young, and R. P. Binzel, eds.) pp. 195–255 [[10.2458/azu\\_uapress\\_9780816540945-ch010](https://doi.org/10.2458/azu_uapress_9780816540945-ch010)]

**Ahrens, C. J.**, D. A. Paige, T. M. Eubanks, *et al.* W. P. Blase, K. E. Mesick, W. Zimmerman, **N. Petro**, P. O. Hayne, and S. Price. Small Penetrator Instrument Concept for the Advancement of Lunar Surface Science *The Planetary Science Journal* 2 (1): 38 [[10.3847/psj/abda4f](https://doi.org/10.3847/psj/abda4f)]

**Ahrens, C.** Modeling cryogenic mud volcanism on Pluto *Journal of Volcanology and Geothermal Research* 406 107070 [[10.1016/j.jvolgeores.2020.107070](https://doi.org/10.1016/j.jvolgeores.2020.107070)]

**Ahrens, C.**, and V. Chevrier. Investigation of the morphology and interpretation of Hekla Cavus, Pluto *Icarus* 114108 [[10.1016/j.icarus.2020.114108](https://doi.org/10.1016/j.icarus.2020.114108)]

**Ahrens, C.**, and V. Chevrier. Compressional Ridges on Baret Montes, Pluto as Observed by New Horizons *Geophysical Research Letters* 46 (24): 14328-14335 [[10.1029/2019gl085648](https://doi.org/10.1029/2019gl085648)]

**Ahrens, C. J.**, W. M. Grundy, K. E. Mandt, *et al.* P. D. Cooper, O. M. Umurhan, and V. F. Chevrier. Recent Advancements and Motivations of Simulated Pluto Experiments *Space Science Reviews* 214 (8): 130 [[10.1007/s11214-018-0558-6](https://doi.org/10.1007/s11214-018-0558-6)]

#### **List of awards won:**

2019: Rising Star Award - West Virginia University Alumni

2019: FIRST LEGO League Coach/Mentor Service Award

2018: Ten Outstanding Young Americans (Jaycees)

2018: Outstanding Young West Virginians (Jaycees)

2010: Astronomical League Horkheimer/D'Auria Youth Service Award

#### **Three fun facts:**

1. I was PI for a Venus aerial balloon mission concept for the 2021 NASA Planetary Science Summer School (PSSS).
2. I've been a NASA Solar System Ambassador for space outreach and education advocacy since 2016.
3. I have named 4 geologic surface features on the surface of Pluto!