

# Conor Hayes

## Curriculum Vitae

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### Education

- 2022–Present **Ph.D. Physics and Astronomy**, *York University*, Toronto, Ontario.  
Advisor: John E. Moores  
Expected graduation: 2026  
–Member of the Planetary Volatiles Laboratory  
–Member of York’s Mars Science Laboratory/Curiosity Rover operations team  
–**Thesis:** *TBD*
- 2020–2022 **M.Sc. Physics and Astronomy**, *York University*, Toronto, Ontario.  
Advisor: John E. Moores  
–Member of the Planetary Volatiles Laboratory  
–Member of York’s Mars Science Laboratory/Curiosity Rover operations team  
–**Thesis:** *One Star Shines on Many Worlds: Exploring Extraterrestrial Water Through Observations of Scattered Light on the Moon and Mars*
- 2016–2020 **B.S. Astronomy and Astrophysics**, *The Ohio State University*, Columbus, Ohio.  
Advisors: Johnny P. Greco & Paul Martini  
–Research Distinction in Astronomy and Astrophysics  
–Completed the Politics, Society, and Law Scholars Program  
–Vice President of the Ohio State Astronomical Society during the 2019-20 academic year  
–**Thesis:** *Spectroscopic Confirmation of Four Ultra-Diffuse Galaxy Candidates in Group Environments*

### Research Experience

- 2020–Present **Graduate Research Assistant**, *York University*, Toronto, Ontario.  
–Examined the effect of small-scale topographic features on the temperature distribution of permanently-shadowed regions at the lunar poles  
–Updated Gale Crater cloud opacity measurements to cover the full five Martian years of the MSL mission, uncovering and correcting several errors with the simplified radiative transfer model used in previous papers.
- 2018–2020 **Undergraduate Research Assistant**, *The Ohio State University*, Columbus, Ohio.

- Conducted an analysis of potentially isolated "red and dead" low surface brightness dwarf galaxies using spectral data from the Multi-Object Double Spectrograph on the Large Binocular Telescope.

## Teaching Experience

- 2020–Present **Graduate Teaching Assistant**, *York University*, Toronto, Ontario.  
Primarily marking/grading with occasional student interaction.
- NATS 1570 (Exploring the Solar System)
  - NATS 1740 (Astronomy)
  - NATS 1880 (Life Beyond Earth)
  - PHYS 1070 (Fundamentals of Astronomy)
  - PHYS 2070 (Galaxies and the Universe)
  - PHYS 4170 (Observational and Theoretical Cosmology)
- 2019–2020 **Undergraduate Instructional Assistant**, *The Ohio State University*, Columbus, Ohio.  
Primarily marking/grading with occasional student interaction.
- ASTRON 1141 (Life in the Universe)

## Publications

1. **Hayes, C.W.**, Minton, D.A., Kloos, J.L., & 1 other (2023). Topography-Enhanced Ultra-Cold Trapping at the LCROSS Impact Site. (in prep).
2. **Hayes, C.W.**, Kloos, J.L., Innanen, A.C., & 3 others (2023). Five Mars Years of Cloud Observations at Gale Crater: Opacities, Variability, and Ice Crystal Habits. *The Planetary Science Journal* (in review).

## Presentations & Conferences

1. **Hayes, C.W.**, Kloos, J.L., Innanen, A.C., & 3 others (March 2023). Five Mars Years of Gale Crater Cloud Opacity Measurements. *54th Lunar and Planetary Science Conference*. Houston, Texas.
2. **Hayes, C.W.**, Minton, D.A., Kloos, J.L., & 1 other (March 2023). Exploring the Effect of Small-Scale Topography on Surficial Temperatures at the LCROSS Impact Site [Poster]. *54th Lunar and Planetary Science Conference*. Houston, Texas.
3. Guzewich, S.D., Martinez, G., Innanen, A.C., & 15 others (**16th**) (March 2023). 10 Years of Environmental Science in Gale Crater. *54th Lunar and Planetary Science Conference*. Houston, Texas.
4. **Hayes, C.W.**, Kloos, J.L., & Moores, J.E. (October 2022). Modeling the Influence of Small-Scale Topography on Surficial Temperatures at the LCROSS Impact Site. *54th Annual Meeting of the Division for Planetary Sciences*. London, Ontario.
5. **Hayes, C.W.**, Kloos, J.L., Campbell, C.L. & 3 others (October 2022). Determining the Scattering Phase Function of Martian ACB Clouds from MSL Observations. *TEPS Conference 2022*. Lonton,

Ontario.

6. **Hayes, C.W.** (July 2022). Modeling the Influence of Small-Scale Topography on Surficial Temperatures at the LCROSS Impact Site. *13th Annual Lunar and Small Bodies Graduate Forum*. Virtual.
7. **Hayes, C.W.**, Kloos, J.L., & Moores, J.E. (June 2022). Five Martian Years of MSL Gale Crater Cloud Opacity Measurements: Determining a Scattering Phase Function for the Aphelion Cloud Belt [Poster]. *7th Mars Atmosphere Modelling and Observations Conference*. Paris, France.
8. Campbell, C.L., Kloos, J.L., Smith, C.L., & 4 others **(5th)** (June 2022). Wind Direction Record of Aerosols Observed by the Mars Science Laboratory. *7th Mars Atmosphere Modelling and Observations Conference*. Paris, France.
9. **Hayes, C.W.**, Kloos, J.L., & Moores, J.E. (November 2021). Small-Scale Topography and the Temperature Distribution of Permanently-Shadowed Regions on the Moon [Poster]. *GAC-MAC 2021*. London, Ontario.
10. Moores, J.E., Campbell, C.L., Innanen, A.C., & 9 others **(6th)**. (November 2021). Studying the Martian Atmosphere above Gale Crater with Cameras. *GAC-MAC 2021*. London, Ontario.
11. *Europlanet Science Congress 2021* (September 2021). Virtual.
12. *2021 NASA Exploration Science Forum and European Lunar Symposium* (July 2021). Virtual.
13. *12th Annual Lunar and Small Bodies Graduate Forum* (July 2021). Virtual.
14. **Hayes, C.W.** (June 2021). Small-Scale Topography and the Temperature Distribution of Permanently-Shadowed Regions on the Moon. *2021 PAGE Graduate Conference*. Virtual.

## Community Service & Outreach

- 2020–Present **Observatory Assistant**, *Allan I. Carswell Observatory*, Toronto, Ontario.
- 2020–Present **Co-Host**, *York Universe*.
- 2019–2020 **Vice President**, *Ohio State Astronomical Society*.

## Affiliations & Membership

- 2022–Present **Division for Planetary Sciences**, *Member*.
- 2020–Present **Mars Science Laboratory Operations Team**, *Environmental Science Theme Lead & Keeper of the Plan*.