

**EDUCATION**

- 2017 Ph.D., Aerospace Engineering, University of Texas at Austin.  
Dissertation title: DSMC Simulations of Volatile Transport in a Transient Lunar Atmosphere and Ice Deposition in Cold Traps After a Comet Impact.
- 2013 M.S., Aerospace Engineering, University of Texas at Austin.  
Focus areas: Aerothermodynamics & Fluid Mechanics, Molecular Gas Dynamics, Planetary Science, Scientific Computing, Science Education.
- 2010 B.Eng., Aerospace Engineering, Nanyang Technological University, Singapore.  
Exchange student at Technische Universiteit Delft, the Netherlands, Spring 2009.

**RESEARCH & TEACHING POSITIONS**

- 2020 to date Staff Scientist, Johns Hopkins University Applied Physics Laboratory.
- 2017 – 2020 Postdoctoral Fellow, Johns Hopkins University Applied Physics Laboratory.
- 2010 – 2017 Graduate Research Assistant, University of Texas at Austin.
- 2015 – 2016 Instructor, University of Texas at Austin.  
Independently taught and managed an upper-division course (*Compressible Flow*) with 50–70 students, for two semesters. Overall instructor ratings of 4.8/5.0 (Spring 2015) and 4.9/5.0 (Spring 2016) in end-of-semester student evaluations.
- 2013 – 2016 Teaching Assistant, University of Texas at Austin.  
*Propulsion* (Fall 2014/15/16; Instructor: Dr. Philip L. Varghese; 40–70 students).  
*Viscous Flow* (Fall 2015; Instructor: Dr. Laxminarayan L. Raja; 21 students).  
*Compressible Flow* (Fall 2013; Instructor: Dr. Thomas M. Kiehne; 66 students).

**CURRENT RESEARCH GRANTS****Modeling the Delivery of Mercury's Polar Ice by a Comet Impact**

Role: Principal Investigator, April 2019 – March 2023.  
Sponsor: NASA/Solar System Workings Program.

**Numerical Simulations of Volatile Transport on the Moon and Mercury**

(Research Allocation on the Texas Advanced Computing Center's Stampede2 Supercomputer)  
Role: Principal Investigator, October 2019 – October 2023.  
Sponsor: NSF/Extreme Science and Engineering Discovery Environment (XSEDE).

**Lab Studies of the Photometric and Polarization Behavior of Planetary Regolith Analogs**

Role: Co-Investigator, September 2018 – August 2022.  
Principal Investigator: Dr. David T. Blewett, JHU Applied Physics Laboratory.  
Sponsor: NASA/Planetary Science Division.

## **Lunar Environment and Dynamics for Exploration Research (LEADER)**

Role: Co-Investigator, November 2019 – October 2024.

Principal Investigator: Dr. Rosemary M. Killen, NASA Goddard Space Flight Center.

Sponsor: NASA/Solar System Exploration Research Virtual Institute (SSERVI).

## **Interdisciplinary Consortium for Evaluating Volatile Origins (ICE Five-O)**

Role: Co-Investigator, November 2019 – October 2024.

Principal Investigator: Dr. Jeffrey J. Gillis-Davis, Washington University in St. Louis.

Sponsor: NASA/Solar System Exploration Research Virtual Institute (SSERVI).

## **PAST RESEARCH GRANTS**

### **Optical Studies of Icy Regolith Analogs**

Role: Co-Investigator, August 2020 – July 2021.

Principal Investigator: Dr. David T. Blewett, JHU Applied Physics Laboratory.

Sponsor: NASA/Solar System Workings Program.

### **Dynamic Response of Environment of Asteroids, the Moon & Moons of Mars (DREAM2)**

Role: Postdoctoral Researcher, June 2017 – March 2019.

Principal Investigator: Dr. William M. Farrell, NASA Goddard Space Flight Center.

Sponsor: NASA/Solar System Exploration Research Virtual Institute (SSERVI).

## **MISSION & INSTRUMENT INVOLVEMENT**

### **Volatiles Investigating Polar Exploration Rover (VIPER) Mission**

Role: Co-Investigator, January 2022 – present.

Project Scientist: Dr. Anthony Colaprete, NASA Ames Research Center.

Sponsor: NASA/Lunar Discovery and Exploration Program.

### **PROSPECT Ion Trap Mass Spectrometer (PITMS) Payload**

Role: Co-Investigator, December 2021 – present.

Principal Investigator: Dr. Barbara Cohen, NASA Goddard Space Flight Center.

Sponsor: NASA/Lunar Discovery and Exploration Program.

### **Surface and Exosphere Alteration by Landers (SEAL) Payload**

Role: Science Team Member, September 2019 – present.

Principal Investigator: Dr. Mehdi Benna, NASA Goddard Space Flight Center.

Sponsor: NASA/Lunar Discovery and Exploration Program.

### **Lunar Reconnaissance Orbiter (LRO) Mission**

Role: Science Team Member, June 2017 – present.

Project Scientist: Dr. Noah E. Petro, NASA Goddard Space Flight Center.

Sponsor: NASA/Lunar Precursor Robotic Program.

## **SELECTED AWARDS & HONORS**

NASA SSERVI Susan Mahan Niebur Early Career Award, 2021.

NASA Robert H. Goddard Exceptional Achievement for Science, Team Award to DREAM2

Center for Space Environments, 2019.

Warren A. and Alice L. Meyer Endowed Scholarship in Engineering, 2016.  
M. J. Thompson Endowed Presidential Graduate Scholarship for Aerospace Engineering, 2015.  
George J. Heuer, Jr. Ph.D. Endowed Graduate Fellowship, 2013.  
Third Place, NASA Lunar Science Institute Student Poster Competition, 2011.

## **SELECTED PROFESSIONAL SERVICE**

SSERVI Volatiles Focus Group Lead, 2018 – present.  
Member, APL Space Exploration Sector Onboarding Advisory Team, 2022 – present.  
Interim Co-Chair, Cross-AG\* Inclusion, Diversity, Equity and Accessibility Working Group,  
2022. \*AG = *NASA Planetary Science Analysis Group*  
Co-Chair, NASA Lunar Surface Science Workshop Session 13: Inclusive Lunar Exploration,  
2022.  
Science Organizing Committee Co-Chair, Joint NASA Exploration Science Forum and European  
Lunar Symposium, 2021.  
Session Co-Chair (Lunar Volatiles Through Remote Sensing, Modeling and Experiments), Lunar  
and Planetary Science Conference, 2021.  
Reviewer, National Academies of Sciences, Engineering, and Medicine, Committee on Planetary  
Protection: Planetary Protection for the Study of Lunar Volatiles, 2021.  
Mentor Judge, SACNAS (Society for Advancement of Chicanos/Hispanics and Native  
Americans) Conference, 2020.  
Co-Chair, NASA Lunar Surface Science Workshop Session 2: Volatiles, 2020.  
Science Organizing Committee, NASA Exploration Science Forum (NESF), 2018, 2020.  
Co-Organizer, Lunar and Small Bodies Graduate Conference, 2014.  
Reviewer, *Acta Astronautica*; *Advances in Space Research*; *Annals of Geophysics*;  
*Astrophysical Journal Letters*; *Earth, Moon, and Planets*; *Earth and Planetary Science  
Letters*; *Geophysical Research Letters*; *Icarus*; *Journal of Geophysical Research: Planets*;  
*Journal of Geophysical Research: Space Physics*; *Nature Astronomy*; *Physics of Fluids*;  
*Planetary Science Journal*; *Science Advances*.  
Panelist/External Reviewer, NASA Science Mission Directorate Research & Analysis Programs.  
Judge, American Geophysical Union Outstanding Student Paper Award, Geological Society of  
America Dornik Student Award, SSERVI NESF Student Poster Competition, Lunar and  
Planetary Institute Exploration of the Moon and Asteroids by Secondary Students Program.

## **SELECTED PROFESSIONAL DEVELOPMENT ACTIVITIES**

Asian Americans and Pacific Islanders in Geosciences (AAPIiG) Mentoring Pod (Mentor), 2022.  
Inclusive Astronomy 2 Conference and Making Inclusive Workplaces Workshop, 2019.  
Planetary Scientist Engagement Institute (SSERVI/JHU-APL/LPI), 2019.  
Johns Hopkins University Teaching Institute, 2018.  
Step UP! Bystander Intervention Training, 2018.  
Inclusive Classrooms Leadership Certificate Seminar (University of Texas at Austin), 2016.

## **SELECTED OUTREACH ACTIVITIES**

Guest Speaker, North County High School, MD, 2022.  
Skype a Scientist (Classroom Conversations with Elementary/Middle Schools in IL, MD, NY,

OR, PA, TX, United States and Canada), 2020-21; and Skype a Scientist Live, 2022.  
Community Scientist Visits with Howard County Public Schools (Grades 2–4), MD, 2021.  
Guest Speaker, Girl Scout Camp Ilchester, Ellicott City, MD, 2019.  
Guest Speaker, Astronomy on Tap South Bay, San Jose, CA, 2019.  
Thermal Infrared Remote Sensing Demo, APL Family Day, 2019; APL Girl Power Stem Expo, 2018, 2019; Joint Base Andrews Air Show, 2017.  
Volunteer, Introduce a Girl to Engineering Day/Explore UT, 2012, 2014, 2016.  
Guest Speaker, Williams Elementary School Career Fair, Austin, TX, 2015.  
Guest Speaker, Grade 5 Science Class, Williams Elementary School, Austin, TX, 2014.

## **INVITED PRESENTATIONS & WORKSHOP PARTICIPATION**

Colloquium, Department of Geology, University of Maryland College Park, September 2022.  
Invited Speaker, Planetary Lunch, University of California Santa Cruz, February 2022.  
Invited Participant, Indigenous & Anticolonial Views of Human Activity in Space Series, Space Enabled Research Group, MIT Media Lab, August, October, and December 2021.  
Guest Lecturer (Exploration of the Moon and Asteroids by Secondary Students Program), Lunar and Planetary Institute, September 2021 and 2022.  
Invited Speaker, Planetary Science and Astrobiology Seminar, Georgia Tech, September 2021.  
Seminar, Department of Physics, Providence Women's College (Calicut, India), July 2021.  
Guest Lecturer (What's Up With Mercury?), Arizona State University, February 2021.  
Invited Speaker, Mini-Moon Seminar Series, Taiwan Space Union and National Central University, Taiwan, December 2020 and February 2021.  
Invited Presentation, Future In-Space Operations Telecon, January 2021.  
Guest Lecturer (Topics in Astrophysics: Mercury), Mount Holyoke College, November 2020.  
Invited Presentation, Panel on Mercury and the Moon, Planetary Science and Astrobiology Decadal Survey, November 2020.  
Invited Speaker, Guy F. Atkinson Distinguished Lecture Series, Department of Geology & Geophysics, University of Utah, October 2020.  
Invited Presentation, National Academies Committee on Planetary Protection, September 2020.  
Division 35 Technical Seminar, Jet Propulsion Laboratory, September 2020.  
Modeling and Simulation Seminar, Johns Hopkins Applied Physics Laboratory, September 2020.  
Seminar, Space Technology and Application Research Lab, Auburn University, September 2020.  
Seminar, Earth and Planets Laboratory, Carnegie Institution for Science, April 2020.  
Seminar, Department of Physics & Astronomy, San Jose State University, February 2020.  
Seminar, Solar System Exploration Division, NASA Goddard Spaceflight Center, January 2020.  
Guest Lecturer (Topics in Astrophysics: The Moon), Mount Holyoke College, December 2019.  
Seminar, Department of Aeronautics & Astronautics, Stanford University, April 2019.  
Invited Speaker, American Geophysical Union Fall Meeting, December 2018.  
Invited Speaker, Panelist, Lunar Polar Volatiles, August 2018.  
Invited Participant, SSERVI Lunar Water Workshop, November 2016.  
Invited Speaker, Brown-Vernadsky Microsymposium, March 2016.

## **PEER-REVIEWED PUBLICATIONS**

**Prem, P.**, Greenhagen, B. T., Donaldson Hanna, K. L., Shirley, K. A., and Glotch, T. D., Modeling Thermal Emission under Lunar Surface Environmental Conditions. *Planetary Science Journal*,

2022.

[<https://doi.org/10.3847/PSJ/ac7ced>]

Steckloff, J. K., Goldstein, D., Trafton, L., Varghese, P., and **Prem, P.**, Exosphere-Mediated Migration of Volatile Species on Airless Bodies Across the Solar System. *Icarus*, 2022.

[<https://doi.org/10.1016/j.icarus.2022.115092>]

Farrell, W. M., **Prem, P.**, Tucker, O. J., Hurley, D. M., Cohen, B. A., and Benna, M., A Lingering Local Exosphere Created by a Gas Plume of a Lunar Lander. *Icarus*, 2022.

[<https://doi.org/10.1016/j.icarus.2021.114857>]

Williams, J. P., Greenhagen, B. T., Bennett, K. A., Paige, D. A., Kumari, N., Ahrens, C. J., Rubanenko, L., Powell, T. M., **Prem, P.**, Blewett, D. T. and Russell, P. S., Temperatures of the Lacus Mortis region of the Moon. *Earth and Space Science*, 2021.

[<https://doi.org/10.1029/2021EA001966>]

Lucey, P. G., Petro, N., Hurley, D., Farrell, W., **Prem, P.**, Costello, E., Cable, M., Barker, M., Benna, M., Dyar, D., and Fisher, E., Volatile Interactions with the Lunar Surface. *Geochemistry (Invited Review)*, 2021.

[<https://doi.org/10.1016/j.chemer.2021.125858>]

Schörghofer, N., Benna, M., Berezhnoy, A. A., Greenhagen, B., Jones, B. M., Li, S., Orlando, T. M., **Prem, P.**, Tucker, O. J., and Wöhler, C., Water Group Exospheres and Surface Interactions on the Moon, Mercury, and Ceres. *Space Science Reviews*, 2021.

[<https://doi.org/10.1007/s11214-021-00846-3>]

**Prem, P.**, Hurley, D. M., Goldstein, D. B., and Varghese, P. L., The Evolution of a Spacecraft-Generated Lunar Exosphere. *Journal of Geophysical Research: Planets*, 2020.

[<https://pubmed.ncbi.nlm.nih.gov/33959468>]

**Prem, P.**, Goldstein, D. B., Varghese, P. L., and Trafton, L. M., Coupled DSMC–Monte Carlo Radiative Transfer Modeling of Gas Dynamics in a Transient Impact-Generated Lunar Atmosphere. *Icarus*, 2019.

[<https://doi.org/10.1016/j.icarus.2019.02.036>]

**Prem, P.**, Goldstein, D. B., Varghese, P. L., and Trafton, L. M., The Influence of Surface Roughness on Volatile Transport on the Moon. *Icarus*, 2018.

[<https://doi.org/10.1016/j.icarus.2017.07.010>]

**Prem, P.**, Artemieva, N. A., Goldstein, D. B., Varghese, P. L., and Trafton, L. M., Transport of Water in a Transient Impact-Generated Lunar Atmosphere. *Icarus*, 2015.

[<https://doi.org/10.1016/j.icarus.2014.10.017>]

## OTHER PUBLICATIONS

Bennett, K. A., and **Prem, P.**, Inclusive Lunar Exploration (Workshop Report), 2022.

[<https://doi.org/10.5281/zenodo.6780356>]

Rivera-Valentín, E., Lynch, K., and contributors (including **Prem, P.**), A Consensus Report on Recommendations from the 2022 Advancing IDEA in Planetary Science Conference, 2022.

[<https://doi.org/10.5281/zenodo.6656887>]

Venkatesan, A., Lowenthal, J., **Prem, P.**, and Vidaurri, M., The Impact of Satellite Constellations

on Space as an Ancestral Global Commons. *Nature Astronomy* (**Invited Perspective**), 2020.  
[<https://doi.org/10.1038/s41550-020-01238-3>]

**Prem, P.**, and 40 co-authors, Lunar Volatiles and Solar System Science. Planetary Science and Astrobiology Decadal Survey 2023-2032 (White Paper), 2020.  
[<https://doi.org/10.3847/25c2cfef.f62324b8>]

Hurley, D. M., and 51 co-authors (including **Prem, P.**), Mission to Characterize Volatiles in Old, Cold, Permanently Shadowed Regions on the Moon. Planetary Science and Astrobiology Decadal Survey 2023-2032 (White Paper), 2020.  
[<https://doi.org/10.3847/25c2cfef.f3dc6df2>]

Lucey, P. G., and 18 co-authors (including **Prem, P.**), Lunar Volatiles Orbiters. Planetary Science and Astrobiology Decadal Survey 2023-2032 (White Paper), 2020.  
[<https://doi.org/10.3847/25c2cfef.900b62df>]

Richey, C. R., and 9 co-authors (including **Prem, P.**), A Call to Planetary 2023 Panels to Implement Actionable Recommendations from Recent National IDEA Studies. Planetary Science and Astrobiology Decadal Survey 2023-2032 (White Paper), 2020.  
[<https://doi.org/10.3847/25c2cfef.cf08661f>]

Richey, C. R., and 5 co-authors (including **Prem, P.**), Lessons Learned on IDEA from the Astro2020 Decadal Survey. Planetary Science and Astrobiology Decadal Survey 2023-2032 (White Paper), 2020.  
[<https://doi.org/10.3847/25c2cfef.29038986>]

Tavares, F. J., and 11 co-authors (including **Prem, P.**), Ethical Exploration and the Role of Planetary Protection in Disrupting Colonial Practices. Planetary Science and Astrobiology Decadal Survey 2023-2032 (White Paper), 2020.  
[<https://doi.org/10.3847/25c2cfef.cdc2f798>]

Watkins, R. N., and 13 co-authors (including **Prem, P.**), Understanding and Mitigating Plume Effects During Powered Descents on the Moon and Mars. Planetary Science and Astrobiology Decadal Survey 2023-2032 (White Paper), 2020.  
[<https://doi.org/10.3847/25c2cfef.f9243994>]

**Prem, P.**, Hibbitts, C. A., Hurley, D. M., and Goldstein, D. B., Science from an Active Volatile Release Experiment. Artemis III Science Definition Team (White Paper), 2020.  
[<https://www.lpi.usra.edu/announcements/artemis/whitepapers/2055.pdf>]

Runyon, K., and 10 co-authors (including **Prem, P.**), Uniquely Multidisciplinary Investigations at Amundsen Crater for Artemis III. Artemis III Science Definition Team (White Paper), 2020.  
[<https://www.lpi.usra.edu/announcements/artemis/whitepapers/2068.pdf>]

## CONFERENCE PRESENTATIONS

### LEAD AUTHOR:

**Prem, P.**, and Bennett, K. A., Inclusive Lunar Exploration (**invited**). *Lunar Exploration Analysis Group Meeting*, 2022.

**Prem, P.**, Patterson, G. W., Jozwiak, L. M., Cahill, J. T. S., Stickle, A. M., and Blewett, D. T., Understanding the Radar Polarimetric Properties of Icy Regolith at the Moon's Poles.

*Advancement of POLarimetric Observations, 2022.*

**Prem, P.**, Patterson, G. W., Jozwiak, L. M., Cahill, J. T. S., and Stickle, A. M., Reconsidering the Radar Scattering Characteristics of Icy Regolith in Lunar Permanently Shadowed Regions. *NASA Exploration Science Forum, 2022.*

**Prem, P.**, Becoming Asian American: Personal Reflections and Messages for My Planetary Science Community. *Advancing IDEA in Planetary Science, 2022.*

**Prem, P.**, Greenhagen, B. T., Donaldson Hanna, K. L., Shirley, K. A., and Glotch, T. D., Modeling Thermal Emission from the Anisothermal Lunar Regolith. *Lunar and Planetary Science Conference, 2022.*

**Prem, P.**, Near-Surface Thermal Gradients on Mercury, *Mercury's Surface Response to the Interplanetary Environment, 2022.*

**Prem, P.**, and Greenhagen, B. T., Modeling the Influence of Epiregolith Thermal Gradients on Airless Body Emission Spectra. *Rock, Dust and Ice Workshop, 2021.*

**Prem, P.**, Blewett, D. T., Patterson, G. W., Virkki, A. K., Cahill, J. T., and Bhiravarasu, S. S., Modeling the Polarization Properties of Icy Regolith Analogs at Optical and Radar Wavelengths. *Lunar and Planetary Science Conference, 2021.*

**Prem P.**, Ernst C. M., Chabot N. L., McFarland E. L., Goldstein D. B., and Hurley D. M., Simulating the Delivery of Water to Mercury's Poles by a Hokusai-like Impact. *Mercury Exploration Assessment Group Meeting, 2021.*

**Prem P.**, Hurley D. M., Goldstein, D. B., Varghese, P. L., and Hibbitts, C. A., Towards Understanding the Impact of Exploration on the Lunar Environment. *Lunar Surface Science Workshop Session 4: Planetary Protection and PSR Classification, 2020.*

**Prem P.**, Hurley D. M., Benna, M., and Orlando, T. M., Lunar Volatiles Science at the Lander Scale. *NASA Exploration Science Forum, 2020.*

**Prem, P.**, Patterson, G. W., Virkki, A. K., Bhiravarasu, S. S., Blewett, D. T., and Cahill, J. T., Modeling the Polarimetric Response of Ice and Regolith in Bistatic Radar Observations of the Lunar Poles. *Lunar and Planetary Science Conference, 2020.*

**Prem, P.**, Hurley, D. M., McFarland, E. L., Chabot, N. L., Ernst, C. M., and Goldstein, D., B., Modeling the Transport, Loss and Deposition of Water on Mercury. *American Geophysical Union Fall Meeting, 2019.*

**Prem, P.**, Hurley, D. M., Modeling the Response of the Lunar Exosphere to the Release of Spacecraft Exhaust Volatiles. *NASA Exploration Science Forum, 2019.*

**Prem, P.**, Greenhagen, B. T., Yasanayake, C. N., and Donaldson Hanna, K. L., Modeling Near-Surface Temperature Gradients and Thermal Emission from the Lunar Regolith. *Lunar and Planetary Science Conference, 2019.*

**Prem, P.**, Hurley, D. M., Goldstein, D. B., Varghese, P. L., Grava, C., and Retherford, K. D., Water Vapor, Where Goest Thou? (**invited**). *American Geophysical Union Fall Meeting, 2018.*

**Prem, P.**, Hurley, D. M., and Patterson, G. W., Perspectives on Modeling the Transport of

Volatiles and Their Distribution at the Lunar Poles (**invited**). *Lunar Polar Volatiles*, 2018.

**Prem, P.**, Greenhagen, B. T., Arnold, J. A., Donaldson Hanna, K. L., Bowles, N. E., Ito, G., and Glotch, T. D., Modeling the Influence of Near-Surface Temperature Gradients on Thermal Emission from Airless Bodies. *NASA Exploration Science Forum*, 2018.

**Prem, P.**, Hurley, D. M., Goldstein, D. B., and Varghese, P. L., Modeling the Propagation of Spacecraft Exhaust Plume Volatiles on the Moon. *NASA Exploration Science Forum*, 2018.

**Prem, P.**, and Patterson, G. W., Modeling the Potential Radar Scattering Characteristics of Water Ice at the Lunar Poles. *Lunar and Planetary Science Conference*, 2018.

**Prem, P.**, Patterson, G. W., and Zimmerman, M. I., Modeling radar scattering by planetary regoliths for varying angles of incidence. *American Geophysical Union Fall Meeting*, 2017.

**Prem, P.**, Artemieva, N. A., Goldstein, D. B., Varghese, P. L., and Trafton, L.M., Simulations of Volatile Transport in the Aftermath of a Lunar Comet Impact. *NASA Exploration Science Forum*, 2017.

**Prem, P.**, Goldstein, D. B., Varghese, P. L., and Trafton, L. M., Modeling the Influence of Small-Scale Surface Roughness on the Lunar Exosphere. *American Astronomical Society/Division for Planetary Sciences Annual Meeting*, 2016.

**Prem, P.**, Artemieva, N. A., Goldstein, D. B., Varghese, P. L., and Trafton, L. M., Transport of Water in a Transient Impact-Generated Lunar Atmosphere (**invited**). *Brown-Vernadsky Microsymposium*, 2016.

**Prem, P.**, Artemieva, N. A., Goldstein, D. B., Varghese, P. L., and Trafton, L. M., The Influence of Surface Roughness on Volatile Transport on the Moon. *American Astronomical Society/Division for Planetary Sciences Annual Meeting*, 2015.

**Prem, P.**, Artemieva, N. A., Goldstein, D. B., Varghese, P. L., and Trafton, L. M., The Transformation of the Lunar Exosphere by a Comet Impact. *American Geophysical Union Fall Meeting*, 2014.

**Prem, P.**, Artemieva, N. A., Goldstein, D. B., Varghese, P. L., Trafton, L. M., and Stewart, B. D., Transport of Water in a Transient Impact-Generated Lunar Atmosphere. *Lunar and Planetary Science Conference*, 2014.

**Prem, P.**, Artemieva, N. A., Stewart, B. D., Goldstein, D. B., Varghese, P. L., and Trafton, L. M., Collisional Processes and Parameters Influencing the Delivery of Volatiles to Lunar Cold Traps after a Comet Impact. *NASA Lunar Science Institute Lunar Volatiles Workshop Without Walls*, 2013.

**Prem, P.**, Artemieva, N. A., Pierazzo, E., Stewart, B. D., Goldstein, D. B., Varghese, P. L., and Trafton, L. M., Cometary Delivery of Lunar Water: Transient Atmosphere Dynamics and Deposition Patterns. *American Astronomical Society/Division for Planetary Sciences Annual Meeting*, 2012.

**Prem, P.**, Pierazzo, E., Stewart, B. D., Goldstein, D. B., Varghese, P. L., and Trafton, L. M., Cometary Delivery of Lunar Water: A Parametric Study. *NASA Lunar Science Institute Lunar Science Forum*, 2011.



STUDENT LEAD AUTHORS (\* = student author):

Alfinito\*, D. E., and **Prem, P.**, Possible Causes of Hydration of Vesta's Oppia Crater. *NASA Exploration Science Forum*, 2022.

Alfaro\*, C., Tran\*, A., Carr\*, K. A., Azubuike\*, O., Carreira\*, C., **Prem, P.**, Dominguez, G., Greenhagen, B. T., Hurley, D. M., Stickle, A. M., Patterson, G. W., and Cahill, J. T. S., The Effect of Isotopic Composition and Surface Residence Times on Lunar Volatile Transport. *Lunar and Planetary Science Conference*, 2021.

CO-AUTHOR (selected):

Magaña, L. O., **Prem, P.**, Byron, B. D., Mandt, K. E., and Retherford, K. D., Surface Roughness at South Pole Cold Traps: Implications for Volatile Deposits. *NASA Exploration Science Forum*, 2022.

Bennett, K. A., and **Prem, P.**, Reflections from the Inclusive Lunar Exploration Lunar Surface Science Workshop. *Advancing IDEA in Planetary Science*, 2022.

Tavares, F., Treviño, N. B., Ravanis, E., **Prem, P.**, and Buckner, D., Ethical Exploration and the Role of Planetary Protection, *34th IAA Symposium on Space Policy, Regulations and Economics*, 2021.

Blewett, D. T., Basic, G., Wiker, J., Newhook, J., Sniderman, A., Klub, D., Martin, A. C., Knuth, A. A., Denevi, B. W., **Prem, P.**, and Sato, H., Planetary Surface Texture Lab: Imaging Polarization and Photometric Studies of Regolith Analogs. *Lunar and Planetary Science Conference*, 2021.

Patterson, G. W., Jozwiak, L. M., Leeburn, J. M., Stickle, A. M., Cahill, J. T. S., Prem, P., and the Mini-RF team, The Surface Roughness and Volatile Content of the Moon: A Radar Perspective. *Lunar Surface Science Workshop Session 8: Foundational Data Products*, 2020.

Lucey, P. G., Costello, E., Hurley, D. M., **Prem, P.**, Farrell, W. M., Petro, N., and Cable, M., Relative Magnitudes of Water Sources to the Lunar Poles. *Lunar and Planetary Science Conference*, 2020.

Hurley, D., **Prem, P.**, Stickle, A., Hibbitts, C., Deutsch, A., Colaprete, A., Elphic, R., Li, S., Lucey, P., Liu, Y., Hosseini, S., Retherford, K. D., Zacny, K., Atkinson, J., Benna, M., Farrell, W., Needham, D., Gertsch, L., Delitsky, M., and Hayne, P., Science from the Lunar Permanently Shadowed Regions. *Lunar and Planetary Science Conference*, 2020.

Shukla, S., Maiti, A., Patterson, G. W., **Prem, P.**, Cahill, J. T. S., Thomson, B. J., Tolpekin, V. A., and Kumar, S., Mini-RF Global and Polar S-Band Maps of the Variation in the Moon's Regolith Dielectric Constant. *Lunar and Planetary Science Conference*, 2020.

Blewett, D. T., Basic, G., Knuth, A. A., Newhook, J., Denevi, B. W., **Prem, P.**, and Sato, H., Construction of a Goniometer Instrument for Imaging Polarization and Photometric Studies of Planetary Regolith Analogs. *Lunar and Planetary Science Conference*, 2020.

Shukla, S., Maiti, A., Patterson, G. W., **Prem, P.**, Bhiravarasu, S. S., Tolpekin, V. A., and Kumar, S., Modelling the Physical Nature of Lunar Regolith at S-Band and L-Band Wavelengths using

the Chandrayaan-2 DFSAR and LRO Mini-RF Radars. *Lunar and Planetary Science Conference*, 2020.

Lucey, P. G., Petro, N. E., Cable, M. L., Hurley, D., Barker, M., Benna, M., Dyar, M. D., Farrell, W. M., Fisher, E. A., Green, R. O., Hayne, P. O., Hibbitts, C., Honniball, C., Li, S., Malaret, E., Mandt, K., Mazarico, E., McCanta, M. C., Orlando, T. M., Pieters, C. M., **Prem, P.**, Sun X., and Thompson, D. R., The Lunar Volatiles Orbiter: A Discovery Mission Proposal to Determine the History and Dynamics of Solar System Volatiles through Observations of the Moon. *American Geophysical Union Fall Meeting*, 2019.

Hurley, D., Colaprete, A., Deutsch, A., **Prem, P.**, Stickle, A. M., Hibbitts, C., Elphic, R. C., Li, S., Hosseini, S., Retherford, K. D., Gertsch, L. S., Zacny, K., Needham, D. H., Delitsky, M., Hayne, P. O., Benna, M., Lucey, P. G., Atkinson, J., Liu, Y., Farrell, W. M., and The PIPELiNE team, A Mission to the Lunar Permanently Shadowed Regions: Polar Ice Prospecting Explorer for Lunar No-light Environments (PIPELiNE). *American Geophysical Union Fall Meeting*, 2019.

Gillis-Davis, J., Ishii, H., Dominguez, G., Lucey, P. G., Mitchell, J., Bradley, J. P., Kaluna, H. M., Li, S., Ichimura, A., Acosta-Maeda, T., Bruno, B. C., Ogliore, R., Jolliff, B. L., Wang, A., Stopar, J., **Prem, P.**, Harrington, A., Orlando, T. M., Hendrix, A. R., Cable, M. L., McKeegan, K. D., Klima, R. L., Daly, M. G., Ghent, R. R., and Cloutis, E., The Interdisciplinary Consortium for Evaluating Volatile Origins (ICE Five-O). *American Geophysical Union Fall Meeting*, 2019.

Greenhagen, B., **Prem, P.**, Donaldson Hanna, K., Bowles, N., and Lucey, P., Investigating Thermal Emission from the Epiregolith: Lunar Lessons for Applications to Airless Bodies. *European Planetary Science Congress/Division for Planetary Sciences Meeting*, 2019.

Steckloff, J., Goldstein, D., **Prem, P.**, Trafton, L., Varghese, P., and Schorghofer, N., How Hydrothermal Vents Affect Water on Ceres. *European Planetary Science Congress/Division for Planetary Sciences Meeting*, 2019.

Hurley, D. M., **Prem, P.**, Stickle, A., Hibbitts, C., Deutsch, A., Colaprete, A., Elphic, R., Li, S., Lucey, P., Liu, Y., Hosseini, S., Retherford, K., Zacny, K., Atkinson, J., Benna, M., Farrell, W., Needham, D., Gertsch, L., Hayne, P., and Delitsky, M., Science Objectives of a Mission to the Lunar Permanently Shadowed Regions. *NASA Exploration Science Forum*, 2019.

Hurley, D. M., **Prem, P.**, Benna, M., Farrell, W. M., Vondrak, R. R., Hendrix, A. R., and Lucey, P. G., Exospheric Signatures of Water Interaction with the Lunar Surface. *NASA Exploration Science Forum*, 2019.

Hurley, D. M., **Prem, P.**, Benna, M., Vondrak, R. R., Farrell, W. M., Hendrix, A. R., and Lucey, P. G., Anatomy of the Lunar Water Exosphere. *Lunar and Planetary Science Conference*, 2019.

Stickle, A. M., Patterson, G. W., Cahill, J. T. S., **Prem, P.**, and the Mini-RF team, Observing the Radar Scattering (Phase) Function of Copernican Crater Ejecta with Mini-RF. *Lunar and Planetary Science Conference*, 2019.

Thomson, B. J., Bhiravarasu, S. S., Nypaver, C., Neish, C. D., Patterson, G. W., **Prem, P.**, and Heggy, E., Latitudinal Trends of anomalous craters Observed with LRO Mini-RF Radar Data. *Lunar and Planetary Science Conference*, 2019.

- Steckloff, J. K., Goldstein, D. B., **Prem, P.**, Varghese, P. L., and Trafton, L. M., The Migration of Impact-Delivered Water to the Cold Traps of Airless Bodies. *American Astronomical Society/Division for Planetary Sciences Annual Meeting*, 2018.
- Patterson, G. W., **Prem, P.**, Stickle, A. M., Cahill, J. T. S., and the Mini-RF team, Mini-RF S- and X-band Bistatic Observations of South Polar Craters on the Moon. *European Planetary Science Congress*, 2018.
- Lucey, P. G., Hurley, D., Farrell, W., Petro, N. E., Cable, M., Dyar, D., Orlando, T., McCanta, M., Fisher, E., Hibbitts, K., **Prem, P.**, Benna, M., Hayne, P., Green, R., Pieters, C. M., Mandt, K., Horanyi, M., Halekas, J., and Li, S., The Lunar Volatile System in Space and Time: Supplies to the Lunar Poles. *Lunar Polar Volatiles*, 2018.
- Tucker, O. J., Killen, R. M., Saxena, P., Johnson, R. E., and **Prem, P.**, Lifetime of a Transient Atmosphere Produced by Lunar Volcanism. *Lunar Polar Volatiles*, 2018.
- Hurley, D. M., **Prem, P.**, Farrell, W. M., Benna, M., and Hendrix, A. R., Exospheric Transport Processes of Lunar Volatiles. *Lunar Polar Volatiles*, 2018.
- Greenhagen, B. T., **Prem, P.**, Donaldson Hanna, K. L., Bowles, N. E., and Lucey, P. G., Investigating Thermal Emission from the Lunar Epiregolith. *Asia Oceania Geosciences Society Annual Meeting*, 2018.
- Hurley, D. M., **Prem, P.**, Vervack, Jr., R. J., Chabot, N. L., Hendrix, A. R., Benna, M., Farrell, W. M., Killen, R. M., Li, S., Lucey, P. G., and Retherford, K. D., Volatiles on Mercury: Lessons from the Moon. *Mercury: Current and Future Science*, 2018.
- Patterson, G. W., **Prem, P.**, Stickle, A. M., Cahill, J. T. S., and the Mini-RF team, Mini-RF S- and X-band Bistatic Observations of South Polar Craters on the Moon. *Lunar and Planetary Science Conference*, 2018.
- Stickle, A. M., Patterson, G. W., Cahill, J. T. S., **Prem, P.**, and the Mini-RF team, Mini-RF Bistatic Observations of Copernican Crater Ejecta. *Lunar and Planetary Science Conference*, 2018.

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