

# Briony H. N. Horgan

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Professor of Planetary Science  
Department of Earth, Atmospheric, and Planetary Sciences  
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## Education and Appointments

- 2023-present **Professor**, Purdue University  
*Department of Earth, Atmospheric, and Planetary Sciences*  
*Courtesy appointment: School of Aeronautics and Astronautics*
- 2020-2023 **Associate Professor**, Purdue University
- 2014-2020 **Assistant Professor**, Purdue University
- 2013 **Faculty Research Associate**, Arizona State University  
*School of Earth and Space Exploration*
- 2010-2012 **Exploration Postdoctoral Fellow**, Arizona State University  
*Advisor: Prof. Phil Christensen*
- 2005-2010 **Ph.D., Cornell University**, Astronomy and Space Sciences  
*Advisor: Prof. Jim Bell*
- 2001-2005 **B.S., Oregon State University**, Physics, *summa cum laude*

## Fields of Expertise

- Geology and mineralogy of the terrestrial planets from rovers and orbital remote sensing
- Visible/near-infrared, short wave-infrared, and mid-infrared spectroscopy
- Analog field work and lab studies of Earth and planetary surface processes
- Mapping and analysis of large hyperspectral and multispectral datasets
- Tactical and strategic rover operations

## NASA Mission Experience

- 2021-present Long-Term Planner and Tactical Science Lead, Mars 2020 Mission
- 2015-present Co-I, Mastcam-Z imaging investigation, Mars 2020 Mission
- 2016-2022 Participating Scientist, Mars Science Laboratory Mission
- 2019-2020 Co-I, Mars Orbiter for Resources, Ices, and Env., Mission Concept Study
- 2018 Co-I, Chariot to the Moons of Mars, PSDS3 Mission Concept Study
- 2008-2014 Science Team, THEMIS, Mars Odyssey Mission

## Awards and Honors

- **College of Science Diversity Award, Purdue University (2023)**
- **College of Science Research Award, Purdue University (2022)**
- NASA Group Achievement Award, Mars 2020 Mastcam-Z Science and Ops Team (2022)
- **University Faculty Scholar, Purdue University (2021-2027)**
- NASA Group Achievement Award, Mars 2020 Mastcam-Z Development Team (2021)
- NASA Group Achievement Award, Pre-Landing Strategic Science Group (2021)

- NASA Group Achievement Award, Mars 2020 Instrument Ops Development Team (2021)
- NASA Group Achievement Award, Mars Science Laboratory Science Team (2017)
- **College of Science Undergraduate Mentoring Award, Purdue University (2016)**
- Arizona State University Exploration Postdoctoral Fellowship (2010-2012)
- Cornell University Eleanor Norton York Prize in Astronomy (2009)
- NASA Mars Exploration Student Travel Award (2009, 2010)
- Lunar and Planetary Institute Career Development Award (2008)
- NASA Harriet G. Jenkins Pre-doctoral Fellowship (2008)
- NASA Earth and Space Science Fellowship (2008)
- Cornell Graduate School Research Travel Grant (2007)
- Oregon State University Physics Undergraduate Scholar Award (2004)
- Zonta Service Foundation Scholarship (2003)
- Oregon State University Excellence in Science Scholarship (2002)
- Krane Scholarship in Physics (2002)
- Achievement Scholarship (2001-2005)
- Oregon University System PASS Scholarship (2001-2005)

## Publications

*G = grad student, U = undergrad, P = postdoc, bold = Horgan is primary advisor*

1. N. Mangold, 12 co-authors, **B. Horgan**, and 8 others (2024) Architecture of fluvial and deltaic deposits exposed along the eastern edge of Jezero crater western fan. *Journal of Geophysical Research – Planets*, accepted.
2. K. Stack, 20 co-authors, **B. Horgan**, and 21 others (2024) Sedimentology and Stratigraphy of the Shenandoah Formation, Western Fan, Jezero Crater, Mars. *Journal of Geophysical Research – Planets*, doi:10.1029/2023JE008187.
3. **H. Vannier<sup>G</sup>**, **B. Horgan**, J. Stopar, M. Henderson. Constraining formation hypotheses for irregular mare patches on the Moon with VNIR spectral data. Submitted to *Journal of Geophysical Research – Planets*, doi:10.1029/2023JE008108.
4. D. Paige, 15 co-authors, and **B. Horgan**. Ground penetrating radar observations of the contact between the western delta and the crater floor of Jezero Crater, Mars. *Science Advances*.
5. **E. Rogers<sup>U</sup>**, **H. Dawson<sup>U</sup>**, **B. Qualizza<sup>U</sup>**, **J. Heidenreich<sup>U</sup>**, **B. Horgan** (2023) Silica-bearing mounds and strata in the southwest Melas Basin, Valles Marineris, Mars: Evidence for a hydrothermal origin, *Journal of Geophysical Research – Planets*, doi: 10.1029/2023JE007881.
6. L. Pigue<sup>G</sup>, K. Bennett, **B. Horgan**, L. Gaddis (2023) Relationship between explosive and effusive volcanism in the Montes Apenninus region of the Moon, *Journal of Geophysical Research – Planets*, accepted.
7. M. Yang, Y. Qian, **B. Horgan**, J. Huang, and L. Xiao. Mineralogy of Surface Materials at the Chang'E-5 Landing Site and Possible Exotic Sources from in-situ Spectral Observations. *Journal of Geophysical Research – Planets*, accepted.

8. **B. Horgan** and 45 co-authors (2023) Mineralogy, morphology, and emplacement history of the Maaz formation on the Jezero crater floor from orbital and rover observations. *Journal of Geophysical Research – Planets*, 128, doi: 10.1029/2022JE007612.
9. **M. Henderson**<sup>6</sup>, **B. Horgan**, J. Stopar, L. Gaddis, S. Lawrence (2023) Mineralogy of Explosive and Effusive Volcanic Edifices in the Marius Hills Volcanic Complex. *Icarus*, 404, doi: 10.1016/j.icarus.2023.115628.
10. L. Crumpler, **B. Horgan**, and 22 co-authors (2023) In Situ Geologic Mapping Transect Observations on the Jezero Crater Floor from Perseverance Rover, *Journal of Geophysical Research – Planets*, 128, doi: 10.1029/2022JE007444.
11. C. Quantin-Nataf, 15 co-authors, **B. Horgan**, and 6 co-authors (2023) The Complex Exhumation History of Jezero Crater Floor Unit., *Journal of Geophysical Research – Planets*, 128, doi: 10.1029/2022JE007628.
12. V. Sun, 27 co-authors, **B. Horgan**, and 20 co-authors (2023) Exploring the Jezero Crater Floor: Summary and Synthesis of Perseverance’s First Science Campaign, *Journal of Geophysical Research – Planets*, 128, doi: 10.1029/2022JE007613.
13. Chaves, L.<sup>6</sup>, M. Thompson, M. Loeffler, C. Dukes, P. Szabo, **B. Horgan** (2023) Evaluating the effects of space weathering on magnetite on airless planetary bodies, *Icarus*, 402, doi:10.1016/j.icarus.2023.115634.
14. Simon, J., 34 co-authors, **B. Horgan**, and 32 co-authors (2023) The First Samples Collected by the NASA Perseverance Rover Mission, *Journal of Geophysical Research – Planets*, 128, doi: 10.1029/2022JE007474.
15. Rice, M., J. Johnson, C. Million, M. St. Clair, **B. Horgan**, and 15 others (2023) Spectral variability of rocks and soils on the Jezero crater floor: A summary of multispectral observations from Perseverance’s Mastcam-Z instrument, *Journal of Geophysical Research – Planets*, 128, doi: 10.1029/2022JE007548.
16. A. Udry, 8 co-authors, **B. Horgan**, and 47 co-authors (2023) A Mars 2020 Perseverance SuperCam Perspective on the Igneous Nature of the Máaz formation at Jezero crater, Mars. *Journal of Geophysical Research – Planets*, doi:10.1029/2022JE007440.
17. A. Vaughan, 7 co-authors, **B. Horgan**, and 17 co-authors (2023) Regolith of the crater floor units, Jezero crater, Mars: Textures, composition, and implications for provenance. *Journal of Geophysical Research – Planets*, doi:10.1029/2022JE007437.
18. S. Alwmark, **B. Horgan**, and 16 co-authors (2023) Varied origins of Artuby signals complex series of geologic events in Jezero crater, Mars, *Journal of Geophysical Research – Planets*, doi:10.1029/2022JE007446.
19. K. Farley, K. Stack-Morgan, D. Shuster, **B. Horgan**, and 104 others (2022) Aqueously altered igneous rocks on the floor of Jezero crater, Mars. *Science*, eabo2196.
20. Y. Liu, 38 co-authors, **B. Horgan**, and 30 co-authors (2022) An olivine cumulate outcrop on the floor of Jezero crater, Mars. *Science*, eabo2756.
21. J. F. Bell III, 8 co-authors, **B. Horgan**, and 83 co-authors (2022) Geological and Meteorological Imaging Results from the Mars 2020 Perseverance Rover in Jezero Crater. *Science Advances*, 8(47), eabo4856.

22. R. Wiens, 21 co-authors, **B. Horgan**, and 70 co-authors (2022) Compositionally and density stratified igneous terrains in Jezero crater, Mars, *Science Advances*, 8(34), eabo3399.
23. M. Rice, 8 co-authors, **B. Horgan**, 8 co-authors (2022), Spectral diversity of rocks and soils in Mastcam observations along the Curiosity rover's traverse in Gale crater, Mars. *Journal of Geophysical Research - Planets*, 127(8), e2021JE007134.
24. **J. Haber**<sup>G</sup>, **B. Horgan**, A. A. Fraeman, J. Johnson, J. F. Bell III, M. Starr, M. Rice, N. Mangold, L. Thompson, D. Wellington, S. Jacob, and E. Cloutis. (2022). Mineralogy of a possible ancient lakeshore in the Sutton Island member of Mt. Sharp, Gale Crater, Mars, from Mastcam multispectral images. *Journal of Geophysical Research - Planets*, doi: 10.1029/2022JE007357.
25. **A. Rudolph**<sup>G</sup>, **B. Horgan**, J. Johnson, K. Bennett, **J. Haber**<sup>G</sup>, J. F. Bell III, V. Fox, S. Jacob, S. Maurice, E. Rampe, M. Rice, C. Seeger, R. Wiens (2022), The distribution of clay minerals and their impact on diagenesis in Glen Torridon, Gale crater, Mars. *Journal of Geophysical Research - Planets*, doi: 10.1029/2021JE007098.
26. K. Bennett, 20 co-authors, **A. Rudolph**<sup>G</sup>, 2 co-authors, **B. Horgan**, and 4 others. An Overview of the Curiosity Rover's Campaign in Glen Torridon, Gale Crater, Mars (2022) *Journal of Geophysical Research - Planets*, 128, doi:10.1029/2022JE007185.
27. R. Smith<sup>P</sup>, S. McLennan, B. Sutter, E. Rampe, E. Dehouck, K. Siebach, **B. Horgan**, V. Sun, A. McAdam, C. Achilles, N. Mangold, and M. Salvatore (2022) X-ray amorphous sulfur-bearing phases in Gale crater sedimentary rocks, Mars. *Journal of Geophysical Research - Planets*, e2021JE007128, doi: 10.1029/2021JE007128.
28. S. Ruff, V. Hamilton, A. D. Rogers, C. Edwards, **B. Horgan** (2022). Olivine and carbonate-rich bedrock in Gusev crater and the Nili Fossae region of Mars may be altered ignimbrite deposits, *Icarus*, 380, doi: 10.1016/j.icarus.2022.114974.
29. **P. Sinha**<sup>G</sup> and **B. Horgan** (2022), Sediments within the icy north polar deposits of Mars record recent impacts and volcanism, *Geophysical Research Letters*, 49, doi:10.1029/2022GL097758.
30. A. Broz<sup>G</sup>, J. Clark, B. Sutter, D. Ming, V. Tu, **B. Horgan**, L. Silva (2022). Mineralogy and diagenesis of Mars-analog paleosols from eastern Oregon, USA. *Icarus*, 380, doi: 10.1016/j.icarus.2022.114965.
31. E. Rampe, **B. Horgan**, **R. Smith**<sup>P</sup>, **N. Scudder**<sup>G</sup>, E. Bamber<sup>U</sup>, **A. Rutledge**<sup>P</sup>, R. Christofferson (2022). A Mineralogical Study of Glacial Flour from Three Sisters, Oregon: An Analog for a Cold and Icy Early Mars. *Earth and Planetary Science Letters*, doi: 10.1016/j.epsl.2022.117471.
32. J. Tarnas, K. Stack, M. Parente, A. Koepfel, J. Mustard, K. Moore, **B. Horgan**, F. Seelos, E. Cloutis, P. Kelemen, D. Flannery, A. Brown, K. Frizzell, P. Pinet (2021). Characteristics, origins, and biosignature preservation potential of carbonate-bearing rocks within and outside of Jezero crater, *Journal of Geophysical Research - Planets*, 126, doi: 10.1029/2021JE006898.
33. N. Mangold, S. Gupta, O. Gasnault, G. Dromart, J. Tarnas, S. Sholes, **B. Horgan**, and 32 others (2021). Perseverance rover finds a delta-lake system and ancient flood deposits at Jezero crater, Mars. *Science*, 374, 711-717, doi:10.1126/science.abl4051.

34. S. Holm-Alwmark, K. Kinch, M. Hansen, S. Shahrzad, K. Svennevig, W. Abbey, R. Anderson, F. Calef III, S. Gupta, E. Hauber, **B. Horgan**, and 7 others (2021). Stratigraphic Relationships in Jezero Crater, Mars – Constraints on the Timing of Fluvial-Lacustrine Activity from orbital observations, *Journal of Geophysical Research - Planets*, doi: 10.1029/2021JE006840.
35. K. Bennett, F. Rivera-Hernandez, **C. Tinker**<sup>U</sup>, **B. Horgan**, D. Fey, C. Edwards, L. Edgsar, R. Kronyak, K. Edgett, A. Fraeman, L. Kah, **M. Henderson**<sup>G</sup>, N. Stein, E. Dehouck, A. Williams (2021). Extensive diagenesis revealed by fine-scale features at Vera Rubin ridge, Gale crater, Mars, *Journal of Geophysical Research – Planets*, 126, doi:10.1029/2019JE006311
36. **R. Smith**<sup>P</sup> and **B. Horgan** (2021). Nanoscale variations in natural amorphous and nanocrystalline weathering products in mafic to intermediate volcanic terrains on Earth: Implications for amorphous detections on Mars. *Journal of Geophysical Research – Planets*, 126, doi:10.1029/2020JE006769.
37. R. Smith, S. McLennan, C. Achilles, E. Dehouck, **B. Horgan**, N. Mangold, E. Rampe, M. Salvatore, K. Siebach, V. Sun (2021). X-ray amorphous components in sedimentary rocks of Gale crater, Mars: Evidence for ancient formation and long-lived aqueous activity, *Journal of Geophysical Research - Planets*, doi:10.1029/2020JE006782.
38. K. Kinch, J. Sølberg, **B. Horgan**, J. Adler, A. Hayes, J. Hurowitz, M. Rice (2021). Landing on Mars: A cross-institutional research-based seminar series, *International Journal of Teaching and Learning in Higher Education*, v33, n3, p328-360 2022.
39. J. Bell, 34 co-authors, **B. Horgan**, and 13 others (2021). The Mars 2020 Perseverance rover Mast Camera Zoon (Mastcam-Z) Multispectral Stereoscopic Imaging Investigation, *Space Science Reviews*, 217, doi:10.1007/s11214-020-00755-x.
40. A. Hayes, P. Corlies, C. Tate, J. Bell, J. Maki, M. Caplinger, K. Kinch, K. Herkenhoff, **B. Horgan**, and 30 others (2021) Pre-flight calibration of the Mars 2020 rover Mastcam Zoom (Mastcam-Z) Multispectral Stereoscopic Imager, *Space Science Reviews*, 217, doi:10.1007/s11214-021-00795-x.
41. **N. Scudder**<sup>G</sup>, **B. Horgan**, E. Rampe, R. Smith, A. Rutledge (2021), The effects of magmatic evolution, crystallinity, and microtexture on the visible/near-infrared and thermal-infrared spectra of volcanic rocks, *Icarus*, 359, doi:10.1016/j.icarus.2021.114344.
42. **M. Henderson**<sup>G</sup>, **B. Horgan**, M. Rowe, K. Wall, **N. Scudder**<sup>G</sup> (2020), Determining the eruption style of explosive volcanic eruptions from spectroscopy of tephra deposits. *Earth & Space Sciences*, 8, doi:10.1029/2019EA001013.
43. **B. Horgan**, J. Johnson, A. Fraeman, M. Rice, C. Seeger<sup>G</sup>, J. Bell, K. Bennett, E. Cloutis, and 10 others (2020), Diagenesis of Vera Rubin ridge, Gale crater, Mars from Mastcam multispectral images, *Journal of Geophysical Research – Planets*, 125, doi: 10.1029/2019JE006322.
44. A. Fraeman, 27 co-authors, **B. Horgan**, and 13 others (2020), The origin of Vera Rubin ridge, Gale crater, Mars: Summary and synthesis of Curiosity's exploration campaign, *Journal of Geophysical Research – Planets*, 125, doi: 10.1029/2020JE006527.
45. A. Fraeman, J. Johnson, R. Arvidson, M. Rice, D. Wellington, R. Morris, V. Fox, **B. Horgan**, S. Jacob, M. Salvatore, V. Sun, P. Pinet, J. Bell, R. Wiens, A. Vasavada (2020), Synergistic

- ground and orbital observations of iron oxides on Mt. Sharp and Vera Rubin ridge, *Journal of Geophysical Research – Planets*, 125, doi: 10.1029/2019JE006294.
46. S. Jacob<sup>G</sup>, D. Wellington, J. Bell, C. Achilles, A. Fraeman, G. Peters, J. Johnson, **B. Horgan**, E. Rampe, L. Thompson, R. Wiens, S. Maurice (2020), Spectral, Compositional, and Physical Properties of the Upper Murray Formation and Vera Rubin Ridge, Gale Crater, Mars (2020), *Journal of Geophysical Research – Planets*, 125, doi: 10.1029/2019JE006290.
  47. J. L'Haridon, 16 co-authors, **B. Horgan**, and 4 others (2020), Iron Mobility during Diagenesis as Observed by ChemCam at the Vera Rubin Ridge, Gale Crater, Mars, *Journal of Geophysical Research – Planets*, 125, doi: 10.1029/2019JE006299.
  48. K. Stack, 41 co-authors, **B. Horgan**, and 23 others (2020). Photogeologic Map of the Perseverance Rover Field Site in Jezero Crater Constructed by the Mars 2020 Science Team, *Space Science Reviews*, **216**, 127, doi: 10.1007/s11214-020-00739-x.
  49. J. Huang, Z. Xiao, L. Xiao, **B. Horgan**, X. Hu, P. Lucey, X. Xiao, S. Zhao, Y. Qian, R. Xu, B. Xue, H. Hang, VNIS PCAM TCAM LCAM team (2020), No olivine-rich mantle material has been detected by Chang'E-4 in-situ observation, *Geology*, 48, doi:10.1130/G47280.1.
  50. N. Balci, Y. Gunes, J. Kaiser, S. Acker, K. Edis, **B. Garczynski<sup>G</sup>**, **B. Horgan** (2020) Biotic and abiotic imprints on Mg-rich stromatolites: lessons from Lake Salda, SW Turkey, *Biogeosciences*, 37, doi: 10.1080/01490451.2019.1710784.
  51. I. Smith, 9 co-authors, **B. Horgan**, and 27 others (2020) The holy grail: A strategy for unlocking the climate record stored within Mars' polar layered deposits, *Planetary & Space Science*, 184, doi:10.1016/j.pss.2020.104841.
  52. J. Bishop, C. Gross, J. Danielson, M. Parente, S. Murchie, **B. Horgan**, J. Wray, C. Viviano, B. Ehlmann, F. Seelos (2020) Multiple mineral horizons in layered outcrops at Mawrth Vallis, Mars, signify changing geochemical environments on early Mars, *Icarus*, 341, doi:10.1016/j.icarus.2020.113634.
  53. F. Poulet, C. Gross, **B. Horgan**, D. Loizeau, J. Bishop, J. Carter, C. Orgel, J.-P. Bibring. (2020) Mawrth Vallis, Mars: A fascinating place for future in situ exploration, *Astrobiology*, 20, doi:10.1089/ast.2019.2074.
  54. **B. Horgan**, R. Anderson, G. Dromart, E. Amador<sup>P</sup>, M. Rice (2020), The mineral diversity of Jezero crater: Evidence for possible lacustrine carbonates on Mars, *Icarus*, 339, doi: 10.1016/j.icarus.2019.113526.
  55. S. Warren<sup>G</sup>, E. Kite, J-P. Williams, **B. Horgan** (2019), Through the thick and thin: New constraints on Mars paleopressure history 3.8 - 4 Ga from small exhumed craters. *Journal of Geophysical Research*, 124, doi: 10.1029/2019JE006178.
  56. **P. Kinzelman<sup>U</sup>**, **B. Horgan** (2019). Preservation of surface and subsurface environments on Mars in filled fractures at Mawrth Vallis. *Journal of Purdue Undergraduate Research*, 9, 42-48, doi:10.5703/1288284316931.
  57. **iMOST** (2019), *The Potential Science and Engineering Value of Samples Delivered to Earth by Mars Sample Return*, (co-chairs D. Beaty, M. Grady, H. McSween, E. Sefton-Nash; documentarian B. L. Carrier; plus **66 co-authors**), *Meteoritics & Planetary Science*, 54(3), 667-671 (executive summary only), <https://doi.org/10.1111/maps.13232>; open access web link to full report: <https://doi.org/10.1111/maps.13242>.

58. J. Lai<sup>G</sup>, **B. Horgan**, J. Bell (2019), Assessing martian bedrock mineralogy through “windows” in the dust using near-infrared and thermal-infrared remote sensing, *Icarus*, doi:10.1016/j.icarus.2019.01.019
59. **R. Smith<sup>P</sup>**, E. Rampe, **B. Horgan**, E. DeHouck (2018), Deriving amorphous component abundance and composition of rocks and sediments on Earth and Mars, *Journal of Geophysical Research - Planets*, doi: 10.1029/2018JE005612.
60. E. Rampe, 18 co-authors, **B. Horgan**, and 9 others (2018), Sand mineralogy within the Bagnold Dunes, Gale crater, as observed in situ and from orbit, *Geophysical Research Letters*, doi: 10.1029/2018GL079073.
61. **A. Rutledge<sup>P</sup>**, **B. Horgan**, J. Havig, E. Rampe, **N. Scudder<sup>G</sup>**, T. Hamilton (2018) Silica dissolution and precipitation in glaciated volcanic environments, and implications for Mars, *Geophysical Research Letters*, doi: 10.1029/2018GL078105.
62. T. Bristow, E. Rampe, C. Achilles, D. Blake, S. Chipera, P. Craig, J. Crisp, D. Des Marais, R. Downs, R. Gellert, J. Grotzinger, R. Hazen, **B. Horgan**, and 12 others (2018), Clay mineral diversity and abundance in sedimentary rocks of Gale crater, Mars, *Science Advances*, 4, doi: 10.1126/sciadv.aar3330.
63. **S. Ackiss<sup>\*G</sup>**, **B. Horgan**, F. Seelos, W. Farrand, J. Wray (2018), Mineralogic evidence for subglacial volcanism in the Sisyphi Montes Region of Mars, *Icarus*, 311, 357-370, doi: 10.1016/j.icarus.2018.03.026.
64. H. Melosh, J. Kendall<sup>\*G</sup>, **B. Horgan**, B. Johnson, T. Bowling, P. Lucey, G. Taylor (2017). South Pole-Aitken basin ejecta reveal the Moon’s upper mantle, *Geology*, 45(12), 1063-1066.
65. L. Hays, H. Graham, **B. Horgan**, S. Potter-McIntyre, A. Williams, D. Des Marais, M. Parenteau, E. Hausrath, T. McCollom, K. Lynch (2017). Report from the Biosignature Preservation and Detection in Mars Analog Environments Workshop, *Astrobiology*, 17, 363-400, doi:10.1089/ast.2016.1627.
66. R. Smith<sup>\*G</sup>, **B. Horgan**, P. Mann, E. Cloutis, P. Christensen (2017). Acid weathering of basalt and basaltic glass: II. Effects of microscopic alteration textures on spectral properties, *Icarus*, doi:10.1002/2016JE005112.
67. **B. Horgan**, R. Smith<sup>\*G</sup>, P. Mann, E. Cloutis, P. Christensen (2017). Acid weathering of basalt and basaltic glass: I. Near-infrared spectra, mid-infrared spectra, and implications for Mars, *Icarus*, doi:10.1002/2016JE005111.
68. B. Ehlmann, 17 co-authors, **B. Horgan**, and 28 others (2016). The sustainability of habitability on terrestrial planets: Insights, questions, and needed measurements from Mars for understanding the evolution of Earth-like worlds, *Journal of Geophysical Research*, doi:10.1002/2016JE005134.
69. L. Fenton, J. Bishop, S. King, B. Lafuente<sup>\*G</sup>, **B. Horgan**, D. Bustos, P. Sarrazin (2016). Sedimentary differentiation of aeolian grains at the White Sands National Monument, NM, USA, *Aeolian Research*, 26, 117-136, doi:10.1016/j.aeolia.2016.05.001.
70. K. Bennett<sup>\*G</sup>, **B. Horgan**, L. Gaddis, B. Greenhagen, C. Allen, P. Hayne, J. Bell, and D. Paige (2016). Complex explosive volcanic activity within Oppenheimer Crater on the Moon, *Icarus*, 273, 296–314, doi:10.1016/j.icarus.2016.02.007.

71. R. Soare, **B. Horgan**, S. Conway, C. Souness, M. El Maarry (2015). Volcanic terrain and the possible periglacial formation of “excess ice” at the mid-latitudes of Utopia Planitia, Mars, *Earth & Planetary Science Letters*, 423, 182–192, doi:10.1016/j.epsl.2015.04.033.
72. K. Lynch\*<sup>G</sup>, **B. Horgan**, J. Munakata Marr, J. Hanley, and 5 others (2015). Near-infrared spectroscopy of lacustrine sediments in the Great Salt Lake Desert: An analog study for Martian paleolake basins, *J. Geophys. Res.*, 120, doi:10.1002/2014JE004707.
73. **B. Horgan** and D. Hooper (2015). Dune Apron/Denivation Features (two entries), in *Encyclopedia of Planetary Landforms*, eds: H. Hargitai, A. Kereszturi, doi: 10.1007/978-1-4614-9213-9.
74. W. Farrand, T. Glotch, **B. Horgan** (2014). Detection of copiapite in the northern Mawrth Vallis region of Mars: Evidence of acid sulfate alteration. *Icarus*, 241, 346-357, doi:10.1016/j.icarus.2014.07.003.
75. **B. Horgan**, E. Cloutis, P. Mann, J. Bell (2014). Near-infrared spectra of ferrous mineral mixtures and methods for their identification in planetary surface spectra, *Icarus*, 234, 132-154, doi:10.1016/j.icarus.2014.02.031.

*Prior to Purdue*

76. L. Fenton, R. Hayward, **B. Horgan**, and 15 others (2013) Summary of the Third International Planetary Dunes Workshop: Remote Sensing and Image Analysis of Planetary Dunes. *Aeolian Research*, 8, 29-38, doi: 10.1016/j.aeolia.2012.10.006.
77. G. Berard\*<sup>U</sup>, D. Applin, E. Cloutis, J. Stromberg, R. Sharma, P. Mann, S. Grasby, R. Bezys, **B. Horgan**, and 7 others (2013). A hypersaline spring analogue in Manitoba, Canada for potential ancient spring deposits on Mars. *Icarus*, 224, 399–412, doi:10.1016/j.icarus.2012.12.024.
78. M. Rice, E. Cloutis, J. Bell, D. Bish, **B. Horgan**, S. Mertzman, M. Craig, R. Renaut, B. Gautason, B. Mountain (2013). Reflectance spectra diversity of silica-rich materials: Sensitivity to environment and implications for detections on Mars. *Icarus*, 223, 499-533, doi:10.1016/j.icarus.2012.09.021.
79. J. Huang\*<sup>G</sup>, C. Edwards, **B. Horgan**, P. Christensen, M. Kraft, L. Xiao (2012). Identification and mapping of dikes with relatively primitive compositions in Thaumasia Planum on Mars: Implications for Tharsis volcanism and the opening of Valles Marineris. *Geophysical Research Letters*, 39, L17201, doi:10.1029/2012GL052523.
80. **B. Horgan**, J. Bell (2012). Widespread weathered glass on the surface of Mars, *Geology*, 40, 391-394, doi: 10.1130/G32755.1.
81. **B. Horgan**, J. Bell (2012). Seasonally active slipface avalanches in the north polar sand sea of Mars: Evidence for a wind-related origin, *Geophysical Research Letters*, 39, L09201, doi:10.1029/2012GL051329.
82. L. Fenton, M. Bishop, M. Bourke, C. Bristow, R. Hayward, **B. Horgan**, and 5 others (2010). Summary of the Second International Planetary Dunes Workshop: Planetary Analogs — Integrating Models, Remote Sensing, and Field Data. *Aeolian Research*, 2, 173-178, doi: 10.1016/j.aeolia.2010.09.001



83. **B. Horgan**, J. Bell, E. Noe Dobra, E. Cloutis, D. Bailey, M. Craig, L. Roach, J. Mustard (2009). Distribution of hydrated minerals in the north polar region of Mars, *Journal of Geophysical Research*, 114, E01005, doi:10.1029/2008JE003187.
84. M. Kangas, M. Ansmann, **B. Horgan**, N. Lemaster, R. Leonardi, A. Levy, P. Lubin, J. Marvil, P. McCreary, T. Villela (2005). A 31 pixel flared 100-GHz high-gain scalar corrugated non-bonded platelet antenna array, *IEEE: Antennas and Wireless Propagation Letters*, 4, 245-248.
85. M. Kangas, M. Ansmann, K. Copsey, **B. Horgan**, R. Leonardi, P. Lubin, T. Villela (2005). A 100-GHz High-gain Tilted Corrugated Nonbonded Platelet Antenna, *IEEE: Antennas and Wireless Propagation Letters*, 4, 304 – 307.

## Upcoming Manuscripts

1. C. Royer, C. Bedford, J. Johnson, **B. Horgan**, **A. Broz**<sup>P</sup>, and 29 others. Intense alteration on early Mars revealed by high-aluminum rocks at Jezero Crater. Submitted to *Nature Geoscience*.
2. **B. Garczynski**<sup>G</sup>, **B. Horgan**, and 37 others. Rock coatings as evidence for late surface alteration on the floor of Jezero crater, Mars. Submitted to *Journal of Geophysical Research – Planets*.
3. **J. Haber**<sup>G</sup>, **B. Horgan**, **A. Rudolph**<sup>G</sup>, Widespread diagenesis at unconformities in Gale crater as observed from Curiosity and orbit. Submitted to *Journal of Geophysical Research – Planets*.
4. L. Mandon et al. Variable iron mineralogy and redox conditions recorded in ancient rocks measured by in situ visible/near-infrared spectroscopy at Jezero crater, Mars. Submitted to *Journal of Geophysical Research – Planets*.
5. C. Bedford et al. The Geochemical and Mineralogical Signature of Glaciovolcanism Near Þórisjökull, Iceland, and its Implications for Glaciovolcanism on Mars. Submitted to *Journal of Geophysical Research – Planets*.
6. **A. Rudolph**<sup>G</sup> and **B. Horgan**. An Orbital Comparison of a Late Mantling Unit on Aeolis Mons with Other Erosion-Resistant Strata Explored by MSL in Gale Crater, Mars. Submitted to *Journal of Geophysical Research – Planets*.
7. M. Jodhpurkar<sup>G</sup>, J. Bell, **B. Horgan**, S. Gupta. Mapping and Characterizing the Northern Fan Deposits in Jezero Crater, Mars. Submitted to *Journal of Geophysical Research – Planets*.

## Other Publications

1. M. Mischna and **B. Horgan** (2023) [Mars Concurrent Exploration Science Analysis Group \(MCE-SAG\) Final Report](#), July 2023.
2. P. Niles, 9 co-authors, **B. Horgan**, and 6 co-authors (2023). [Science Objectives for Human Exploration of Mars Workshop Report](#), February 2023.
3. M. Rice and **B. Horgan** (2021) [NASA's Perseverance Rover Is Closer Than Ever to Finding Ancient Alien Life on Mars](#), *The Conversation*, October 2021.
4. **B. Horgan** (2021) The Perseverance Mars Rover: NASA's Next Giant Leap in the Search for Signs of Life Beyond Earth, [LPI Bulletin](#), January 2021.

5. Mars Architecture Strategy Working Group (MASWG), Jakosky, B., R. Zurek, 6 others, **B. Horgan**, 7 others (2020). [\*Mars, the Nearest Habitable World—A Comprehensive Program for Future Mars Exploration.\*](#)
6. W. Calvin, N. Putzig, J. Holt, A. Bramdon, C. Dundas, B. Ehlmann, **B. Horgan**, G. Morgan, S. Murchie, W. Patterson, K. Seelos, H. Sizemore (2020) MORIE: Mars Orbiter for Resources, Ices, and Environments, [Planetary Mission Concept Study report.](#)
7. **B. Horgan** and M. Rice (2020) NASA's big move to search for life on Mars – and to bring rocks home. [The Conversation](#), 7/30/2020.
8. **B. Horgan** and 18 co-authors (2020) The evolution of habitable environments on terrestrial planets: Insights and knowledge gaps from studying the geologic record of Mars ([White paper](#)). Submitted to the *Planetary Science & Astrobiology Decadal Survey*.
9. **B. Horgan** (2013). Planetary Science: Evolved Magma on Mars (News & Views). *Nature Geoscience*, doi:10.1038/ngeo2010.

## Support: Current and Past

2021-2024	Long-Term Planner, Mars 2020 Mission
2024-2027	Principal Investigator, NASA Mars Data Analysis Program <i>Remote sensing of impact-induced hydrothermal systems...</i>
2023-2026	Co-Investigator, NASA Mars Data Analysis Program <i>The climate record of polar outliers on Mars (PI: Dr. Mike Sori)</i>
2021-2025	Principal Investigator, NASA Mars Data Analysis Program <i>Constraining the nature of Noachian surface environments and climates...</i>
2021-2025	Co-Investigator, NASA Solar Systems Working Program <i>Between a rock and a frozen place: Cold-based glacial... (PI: Dr. Allie Rutledge)</i>
2020-2021	Co-Investigator, NASA Planetary Mission Concepts Studies <i>Mars Orbiter for Resources, Ice, and Environment (PI: Prof. Wendy Calvin)</i>
2020-2024	Co-Investigator, NASA Mars2020 Mission Phase E/EM1 <i>Mastcam-Z: A Geologic, Stereoscopic, and Multispectral... (PI: Prof. Jim Bell)</i>
2020-2023	Co-Investigator, NASA Lunar Data Analysis Program <i>Investigating Explosive Volcanic Deposits in the... (PI: Dr. Kristen Bennett)</i>
2019-2023	Co-Investigator, NASA Solar System Workings Program <i>Investigating the Role of Sulfides and Fe-Oxide... (PI: Prof. Michelle Thompson)</i>
2019-2022	Co-Investigator, NASA Lunar Data Analysis Program <i>Remote Sensing Investigations of Irregular Mare Patches... (PI: Dr. Julie Stopar)</i>
2018-2023	Co-Investigator, NASA Planetary Science Through Analog Research Program, <i>SAND-E: Semi-Autonomous Navigation for Detrital... (PI: Prof. Ryan Ewing)</i>
2017-2018	Co-Investigator, NASA Planetary Science Deep Space SmallSats Program, <i>Chariot to the Moons of Mars (PI: Prof. David Minton)</i>
2016-2021	Principal Investigator, NASA MSL Participating Scientist Program <i>Using composition to constrain paleoenvironments and sites of organic...</i>
2016-2019	Principal Investigator, NASA Solar System Workings Program <i>Icy environments on Mars: Investigating Glacial Weathering in Volcanic...</i>

- 2016-2019 Co-Investigator, NASA Lunar Data Analysis Program  
*Lunar pyroclastic deposits: Windows to the Lunar Interior* (PI: Dr. Lisa Gaddis)
- 2016-2019 Co-Investigator, NASA Mars Data Analysis Program  
*Determining the Distribution of Martian Chlorine Salts* (PI: Dr. Jennifer Hanley)
- 2015-2020 Co-Investigator, NASA Mars2020 Mission Phases B-D  
*Mastcam-Z: A Geologic, Stereoscopic, and Multispectral...* (PI: Prof. Jim Bell)
- 2013-2016 Principal Investigator, NASA Mars Data Analysis Program  
*Investigating the origin and alteration history of north polar sediments...*
- 2012-2015 Co-Investigator, NASA Mars Data Analysis Program  
*Imaging and spectroscopic studies of the martian surface* (PI: Prof. Jim Bell)
- 2010-2012 Fellow, Exploration Postdoctoral Fellowship, Arizona State University  
*Reconstructing ancient surface environments on Mars: Spectral and analog...*
- 2008-2011 Student Co-I, NASA Mars Data Analysis Program  
*Mineralogic and morphologic studies of Mars and...* (PI: Prof. Jim Bell)
- 2008-2010 Fellow, NASA Harriet G. Jenkins Pre-doctoral Fellowship  
*Minerals, ice, and dunes: Signs of water-related...* (Mentor: Dr. Ken Tanaka)

## Students and Postdocs Mentored

Students are listed by graduation year, with current position (when known).

### Postdocs by years advised (current position)

- 2023- Lingqi Zeng
- 2022- Adrian Broz
- 2016-2018 Rebecca Smith – Environmental Consultant, State of New Mexico
- 2015-2019 Alicia Rutledge -- Faculty Research Assoc., North. Arizona Univ.

### PhD students

- 2028 Margaret Deahn
- 2027 Athanasios Klidaris
- 2025 Hunter Vannier
- 2023 James Haber Postdoc, Smithsonian Institution
- Brad Garczynski *NASA Early Career Collaboration Award, EAPS K-12 Outreach Award* -- Postdoc, Western Washington University
- Amanda Rudolph *NSF Fellow, Amelia Earhart Fellow, LPI Career Development Award*  
Postdoc, Smithsonian Institution
- 2022 Prakhar Sinha *NASA Future Investigator* -- Postdoc, MIT
- 2020 Marie Henderson *NSF Fellow, Amelia Earhart Fellow, EAPS Outstanding Graduate Student Award* -- Postdoc, NASA Goddard Space Flight Center)
- 2018 Sheridan Ackiss *NASA Fellow, Purdue Doctoral Fellow* -- Consultant, ESRI

### MS students

- 2023 Noel Scudder, *NASA Fellow, EAPS Andrews Fellow*  
Kirtee Ramo, *Professional MS, Geodata Science* -- PhD student, Stony Brook Univ.
- 2018 Prakhar Sinha, *MS in Aeronautical and Astronautical Engineering*

### Geodata Science Professional MS

- 2024 Rachel Caulfield  
2022 Kitee Ramo (*PhD student at Stony Brook Univ.*)

### Undergraduate researchers

- 2026 Laura Barratt  
2024 Madison Schaefer  
2023 Adrienne Rudolph (*PhD student at Univ. Maryland*), Eshaana Aurora, Adler Edsel, Taylor Bourikas, Ryan Navarre (*MS student at MSU*)  
2022 Emma Rogers (*PhD student at Dartmouth College*)  
2021 Joseph Heidenreich, Henry Dawson (*PhD student at Wash. Univ.*), Briar Qualizza  
2020 Connor Tinker (*PhD student at Stony Brook Univ.*), Adam Lechowicz, Phoebe Kinzelman (*MS student at Boise State Univ.*), Madeson Van Buskirk, Rebecca Carmack (*PhD student at Northern Arizona Univ.*), Dan McGahan  
2019 Ben Oxley (*PhD student at Northwestern*), Bryan Howl (*MS, Stony Brook Univ.*), Jonathan Forss, Minna Rubio  
2018 Laura Chaves Moreno (*PhD student at Purdue*), Brandon Smith  
2017 John Riccione (*Founder & CEO at Classmate, LLC*), Aaron Campbell (*US Congressional staffer*), Rhianna Moore (*PhD student at Univ. Tennessee – Knoxville*), Elizabeth Spiers (*PhD student at Georgia Tech*)  
2016 Ellen Czaplinski (*PhD, Univ. Arkansas, Postdoc at JPL*), Rachel Maxwell (*PhD at Univ. California – Santa Cruz, Postdoc at Stanford*), Caleb Engle (*MS, Colorado School of Mines*)  
2014 Danielle Clarke (*Engineer, Intel*)

### Graduate committees:

Marcella Yant (Stonybrook University Geological Sciences PhD 2017), Ya-Huei Huang (EAPS PhD 2018), Andy Hesselbrock (EAPS PhD 2018), Jordan Hill (IE PhD 2020), Carlisle Wishard (EAPS PhD 2023), Dara Laczniak (EAPS PhD 2023), Laura Chaves (EAPS PhD 2023), Alexander Kling (EAPS PhD 2025), Stephanie Menten (EAPS PhD 2026), Eli Mansback (MIT Geophysics PhD 2026), Henry Manelski (EAPS PhD 2027), Steph Connell (EAPS PhD 2027), Santa Perez Cortes (EAPS PhD 2027)

## Teaching Experience

- 2023-present **Undergraduate Committee Chair**, EAPS, Purdue University  
2014-present **Faculty Instructor**, EAPS, Purdue University  
Curriculum coordinator for Planetary Science major.  
*Primary courses: EAPS 556, “Planetary Geology”, EAPS 105, “The Planets”; EAPS 577 “Remote Sensing of the Planets”.*  
2014-present **Advisor** for Undergraduate and Graduate Students, Purdue University  
2009 **Field trip leader**, Cornell University  
*Astro 577, “Planetary Surface Processes”*  
2005-2006 **Graduate Teaching Assistant**, Cornell University  
*Astro 102, “Our Solar System”; Astro 310, “Planetary Image Processing”*

- 2003-2005 **Undergraduate Teaching Assistant, Oregon State University**  
*Introductory and Advanced Physics courses*
- 2003-2005 **Physics Department Tutor, Oregon State University**

## Invited Talks

- 2023 Feb. Arizona State University, SESE Colloquium, Tempe, AZ  
 July Goldschmidt 2023 Conference, Keynote Speaker, Lyon, France  
 Oct. Washington University, EPS Colloquium, St. Louis, MO
- 2022 Apr. University of Idaho Geology Colloquium, *virtual*  
 Apr. University of California – Los Angeles Planetary Science Seminar, *virtual*  
 May University of Chicago, Geophysical Sciences Seminar, Chicago, IL  
 Oct. Indiana Univ. Medical School Colloquium, Bloomington, IN
- 2021 Apr. University of Nevada – Reno Geology Colloquium, *virtual*  
 Apr. Oregon State University Physics Colloquium, *virtual*  
 Apr. Montana State Univ. Earth Sciences Colloquium, *virtual*  
 Sept. Purdue – Fort Wayne Physics Colloquium, *virtual*
- 2020 June Lunar & Planetary Institute Colloquium, *virtual*  
 Sep. University of Notre Dame, Physics Colloquium, *virtual*  
 Oct. University of California – Santa Cruz, *virtual*
- 2019 Feb. University of Kentucky, Earth & Env. Sci. Seminar, Lexington, KY  
 Mar. University of Michigan, Earth & Env. Sci. Seminar, Ann Arbor, MI  
 Aug. Goldschmidt 2019 Conference, Keynote Speaker, Barcelona, Spain  
 Sep. Southern Illinois University, Geology Colloquium, Carbondale, IL  
 Sep. Purdue University, EAPS Colloquium, West Lafayette, IN
- 2018 Feb. EPS Seminar Series, Northwestern University, Evanston, IL  
 Apr. Earth & Env. Sciences Seminar, University of Illinois, Chicago, IL  
 June Clay Minerals Society Annual Meeting, Champaign-Urbana, IL  
 June Mars Workshop on Amazonian and Present Day Climate, Denver, CO  
 July Star Quest, Central Appalachian Astronomy Club, Greenbank, WV  
 Nov. ExoMars 5<sup>th</sup> Landing Site Selection Workshop, Leicester, UK  
 Dec. American Geophysical Union Fall Meeting, Washington, D.C.
- 2017 Jan. Texas A&M Geology & Geophysics seminar, College Station, TX  
 Apr. Physics Colloquium, IUPUI, Indianapolis, IN
- 2016 Feb. Purdue Back to Class alumni seminar, Naples, FL  
 Mar. Geology Colloquium, Univ. of Cincinnati, Cincinnati, OH  
 Apr. Purdue Meet the Dean alumni seminar, Indianapolis, IN  
 July Purdue President’s Council Family Day, Chicago, IL  
 Oct. SESE Colloquium, Arizona State University, Tempe, AZ  
 Oct. Indiana Astronomical Society, Indianapolis, IN  
 Oct. National Geographic Live! Mankind to Mars, Chicago, IL
- 2015 Feb. EPS Colloquium, State University of New York – Stonybrook, Stonybrook, NY  
 May Seminar, NASA Goddard Space Flight Center, Greenbelt, MD  
 June Seminar, Southwest Research Institute, Boulder, CO  
 Sept. Dawn or Doom 2 Conference, Purdue University, West Lafayette, IN

- Nov. NASA Astrobiology Institute Seminar, University of Washington, Seattle, WA
- Dec. American Geophysical Union Fall Meeting, San Francisco, CA
- 2014 Nov. University of Tennessee EPS Colloquium, Knoxville, TN
- 2012 May Planetary Science Institute Seminar, Tuscon, AZ
- Nov. Harvey Mudd Physics Colloquium, Claremont, CA
- Nov. Geological Society of America Annual Meeting, Charlotte, NC
- 2011 April USGS Astrogeology Science Center Seminar, Flagstaff, AZ
- 2010 Aug. Buffalo State University Science Colloquium, Buffalo, NY
- 2009 April MIT Women in Aerospace Symposium, Cambridge, MA

## Media Coverage

1. [What mud cracks on Mars tell us about whether life could have formed on the planet](#), *PBS Newshour*, 09/29/2023.
2. [Mars region offers NASA rover environment to search for evidence of ancient microbial life](#), *Purdue News*, 09/20/2023.
3. [What has Perseverance found in two years on Mars?](#), *Science News*, 02/17/2023.
4. [NASA's Perseverance rover opens a window to Mars' watery past](#), *Space.com*, 11/23/2022.
5. [The sands of Mars are green as well as red, rover Perseverance discovers](#), *Purdue News*, 08/25/2022.
6. [Perseverance: Nasa rover begins key drive to find life on Mars](#), *BBC*, 05/22/2022.
7. [Enigmatic Rocks On Mars Show Evidence Of A Violent Origin](#), *Space Ref*, 04/26/2022.
8. [NASA's Perseverance Rover Is Hunting for Ancient Life](#), *Popular Mechanics*, 03/19/2022.
9. [Perseverance rover's second year on Mars to focus on rock samples, river delta](#), *UPI*, 02/18/2022.
10. [NASA's Perseverance rover marks its first year hunting for past life on Mars](#), *NPR*, 02/18/2022.
11. [A year after landing on Mars, Perseverance rover sets sights on intriguing new target](#), *CNN*, 02/18/2022.
12. [NASA's Perseverance rover prepares for its longest Mars drive yet](#), *Axios*, 02/17/2022.
13. [A year on Mars & the gift of space](#), *NPR Are We There Yet? Podcast*, 02/15/2022.
14. [Purdue professor, Perseverance member preparing for year two as rover mission reaches landing anniversary](#), *Purdue news*, 02/14/2022.
15. [Purdue professor, Mars rover mission team member looks at what is ahead](#), *Lafayette Journal & Courier*, 01/23/2022.
16. [This Martian Wasteland Was Once a Lake](#), *The Atlantic*, 10/07/2021.
17. [See some of the most intriguing photos from NASA's Perseverance rover so far](#), *Science News*, 08/19/2021.
18. [Excitement as Mars rover drills first rock core for return to Earth](#), *Nature*, 08/06/2021
19. [Perseverance rover prepares to collect Martian samples that will be sent to Earth](#), *CNN*, 07/22/2021.
20. [The Focus: Wednesday April 21](#), *Radio Adelaide (AU)*, 04/21/2021.
21. [Purdue Scientist Discusses Role in NASA's Perseverance Mars Rover](#), *This is Purdue Podcast*, 04/29/2021.

22. [Where did Mars's liquid water go? A new theory holds fresh clues](#), *National Geographic*, 3/16/2021.
23. [The Focus: Tuesday March 2](#), *Radio Adelaide (AU)*, 03/02/2021.
24. [Purdue Prof. Discusses work on Mars rover team](#), *WLFI*, 02/25/2021.
25. ['You only get one shot': Purdue professor part of NASA team that landed Mars Perseverance](#), *Journal & Courier*, 02/20/2021.
26. [What we're learning for NASA's Perseverance Mars mission 1 week later](#), *NPR Here & Now*, 02/25/2021.
27. Red Planet 'touchdown' kicks off hunt for ancient life (print), *Washington Post*, 02/22/2021.
28. Mars (special print issue + map), *National Geographic*, 02/2021.
29. [Mars landing: Nasa's Perseverance rover in 'great shape'](#), *BBC News*, 02/19/2021.
30. [NASA Mars rover: Perseverance robot all set for big test](#), *BBC News*, 02/18/2021.
31. [LIVE STREAM: Watch NASA's Perseverance Rover Land on Mars After '7 Minutes of Terror'](#), *Vice News*, 02/18/2021.
32. [NASA's fifth Mars rover, Perseverance, makes historic landing](#), *Al Jazeera*, 02/18/2021.
33. [NASA Rover Successfully Lands On Mars, Begins Search For Remnants Of Ancient Life](#), *NPR Here and Now*, 02/18/2021.
34. [NASA's rover is on Mars. What happens next is up to Washington.](#), *Politico*, 02/18/2021.
35. [NASA Rover Survives 7 Minutes of Terror, Lands on Mars in Search of Ancient Life](#), *Daily Beast*, 02/18/2021.
36. [NASA's Perseverance rover lands on Mars](#), *PBS News Hour*, 02/18/2021.
37. [What a lake in Turkey can tell us about Mars](#), *Earth Matters, NASA Earth Observatory*, 02/17/2021.
38. [How NASA Aims to Achieve Perseverance's High-Stakes Mars Landing](#), *Scientific American*, 02/17/2021.
39. [NASA's Perseverance rover ready to search for signs of ancient life on Mars](#), *LA Times*, 02/17/2021.
40. [Explore Jezero Crater, the future home of NASA's Perseverance rover](#), *CNN*, 02/16/2021.
41. Live interview, 4pm Newscast, *Fox 59 News*, 02/16/2021.
42. [The hunt for life on Mars: A visual guide to NASA's latest mission](#), *Nature*, 02/16/2021.
43. [Upcoming Mars rover landing marks latest step in researching the red planet](#), *Purdue News*, 02/15/2021.
44. *Mars mach mobil*, *Neue Zürcher Zeitung* (Swiss newspaper, printed), 02/14/2021.
45. [NASA's Perseverance rover is about to land on Mars and look for life](#), *New Scientist*, 02/11/2021.
46. [Mars professor searching for signs of the red planet's evolution](#), *Purdue News*, 02/11/2021.
47. [Search For Life On Mars Aided By Purdue Expert](#), *WBAA*, 02/09/2021.
48. [Purdue scientist reflects on her passion for studying Mars' geology, landscape](#), *Purdue News*, 02/09/2021.
49. [Panelist: Perseverance Mars Rover Pre-Landing News Conference](#), NASA, 01/27/2021
50. [Purdue's Connection to NASA's Perseverance Mars Rover Mission](#), *Full Steam Ahead Podcast*, 10/20/2020.
51. [Solar System Smackdown: Mars v. Venus](#), *NPR Science Friday*, 10/09/2020.



52. [Is there other life in the universe? Purdue scientist is ready to search for the answers](#), *Purdue News*, 09/28/2020.
53. [Lake Salda, Turkey Shares A Similar Mineralogy With Jezero Crater On Mars](#), *NASA Press Release*, 07/31/2020.
54. [NASA Goes Looking for Tiny Ancient Martians](#), *The Atlantic*, 7/30/2020.
55. [Jez like Mars](#), *NASA Earth Observatory*, 7/30/2020.
56. [With Perseverance, NASA launches new stage in Mars exploration](#), *Christian Science Monitor*, 7/30/2020.
57. [Purdue scientist plays a critical role in 2020 NASA Mars rover mission](#), *Purdue News*, 7/30/2020.
58. [NASA's Perseverance rover will seek signs of past life on Mars](#), *Science News*, 07/28/2020.
59. [The end of the beginning of Mars exploration](#), *Axios*, 7/28/2020.
60. [Mars \(probably\) has a lake of liquid water](#), *Science News*, 07/25/2020.
61. [Nasa Mars rover: How Perseverance will hunt for signs of past life](#), *BBC*, 7/24/2020.
62. [Has life existed beyond Earth? Purdue professor going to great lengths to find out](#), *Purdue News*, 07/22/2020.
63. [Mars Express helps uncover the secrets of Perseverance landing site](#), *ESA*, 07/01/2020.
64. [NASA's new rover will collect martian rocks—and clues to planet's ancient climate](#), *Science*, 06/25/2020
65. [Perseverance Mars Rover & the Search for Ancient Life](#), *NASA Science Live*, 07/22/2020.
66. [Mars 2020: Looking for signs of life with Perseverance and Mars Sample Return](#), *Superheroes of Science Podcast*, 5/20/2020.
67. [The Perseverance Rover Is NASA's Big Move to Search for Life on Mars](#), *The Wire*, 04/08/2020.
68. [The Pros and Cons of a Lunar Pit Stop](#), *The Atlantic*, 02/18/2020.
69. [The Mars 2020 rover will visit the perfect spot to find signs of life, new studies show](#), *The Washington Post*, 11/16/2019
70. [Mars 2020 will search for microscopic fossils](#), *JPL Press Release*, 11/12/2019.
71. [How long was Mars wet?](#), *Planetary Radio*, 10/23/2019.
72. [The role of a Turkish lake in an EAPS student's Mars research](#), *EAPS Newsletter*, 9/12/2019.
73. [EAPS graduate student awarded NASA fellowship for Mars research](#), *EAPS Newsletter* 9/12/2019
74. [EAPS graduate student investigating Gale crater on Mars](#), *EAPS Newsletter*, 9/4/2019.
75. [Life may have existed on warm, rainy, ancient Mars before winter came](#), *CNN*, 8/21/2019. Goldschmidt press release, also covered by *Newsweek*, *Fox News*, *NY Post*, *Space.com*, *Express.co.uk*, *Metro.co.uk*, and **180 other news sites**.
76. [Robots Explore 'Mars-Like' Lava Field in Iceland as Prep for NASA's Mars 2020 Rover](#), *Space.com*, 8/21/2019.
77. [Mars may have been drenched in rain and supported life in billions of years ago: study](#), *NY Daily Mail*, 8/20/2019.
78. [Ancient Mars had warm weather and rainstorms before the planet turned icy, scientists say](#), *Newsweek*, 8/20/2019.
79. [Is there life on Mars? Iceland Review](#), 8/12/2019.
80. [Humans will never colonize Mars](#). *Gizmodo*, 7/30/2019.



81. [The Lafayette meteorite and Purdue's 150th anniversary celebration](#), *Meteorite Times Magazine*, 7/1/2019.
82. [Two new Earth-like exoplanets could support life](#), *Purdue News*, 6/21/2019.
83. [China's lunar rover may have found minerals from the moon's mantle](#), *Science News*, 5/15/2019.
84. [China's rover peeks under the crust of the far side of the moon](#), *New Scientist*, 5/15/2019
85. [If Mars Had Water, Where Did It Go?](#), *Gizmodo*, 4/8/2019.
86. [Mars Rover Opportunity's Legacy Continues With Purdue Researchers](#), *Lakeshore Public Radio*, 2/15/2019.
87. [China's lunar planting sows seeds of exploration](#), *China Daily*, 1/23/2019.
88. [US analysts call for more cooperation in space](#), *China Daily*, 1/15/2019
89. [China just landed a spacecraft on the moon's far side. Here's what Chang'e 4 will teach us.](#), *NBC News*, 1/3/2019.
90. [What does the 'far side' of the moon look like?](#), *BBC Radio News*, 1/3/2019.
91. [The Far Side of the Moon: What China and the World Hope to Find](#), *New York Times*, 1/3/2019.
92. [China's Lunar Lander To Explore Moon's Far Side](#), *NPR*, 1/1/2019.
93. [What chance has Nasa of finding life on Mars?](#), *BBC News*, 12/14/2018.
94. Why Jezero Crater is the place for Mars 2020/sample return, *AGU Press Conference*, 12/12/2014.
95. ['Blueberries' on Mars Have a Watery Past. But Scientists Are Still Baffled](#), *Space.com*, 12/5/2018.
96. [A Purdue planet expert shares insight about NASA's InSight lander](#), *WLFI*, 11/26/2018.
97. [Red Planet InSight: Why Do We Keep Going Back to Mars?](#), *Space.com*, 11/26/2018.
98. [We Know Where the 2020 Rover Will Look for Martian Life](#), *Planetary Radio*, 11/21/2018.
99. [NASA's 2020 rover will search Mars for signs of life](#), *Popular Science*, 11/21/2018.
100. [We're going to Jezero! NASA Selects Jezero Crater Landing Site for Mars 2020 Rover.](#) *The Planetary Society*, 11/20/2018.
101. [Texas A&M Leading \\$1.1 Million NASA-Funded Study Of Mars-Like Icelandic Environments.](#) *Texas A&M Today*, 10/18/2018.
102. [Seeing Mars in a Grain of Sand.](#) *Eos Editor's Vox*, 10/17/2018.
103. [NASA's next Mars rover could explore former mineral springs and a fossil river delta](#), *Science*, 10/10/2018.
104. [To Mars and beyond: How a new Mars rover mission could unlock answers about Earth.](#) *WLFI*, 9/30/2018
105. [If intelligent aliens exist, why haven't we seen them?](#) *Purdue Alumni Magazine*, 8/22/2018.
106. [Mars \(probably\) has a lake of liquid water](#), *Science News*, 7/25/2018
107. [EVPRP social media accounts featuring 31 Purdue women researchers.](#) *Purdue Today*, 3/1/2018.
108. Purdue EVPRP Research Highlights, 1/2018 printing, "Mars"
109. [Purdue research team gearing up for an out-of-this-world experience](#), *WLFI*, 12/12/2017.
110. *Sky and Telescope*, 11/2017 print issue, "The Race to Mars?"
111. [Episode 72: Moonquake.](#) *Titanium Physics Podcast*, 5/1/2017.
112. [Three sites where NASA might retrieve its first Mars rock.](#) *Nature*, 2/10/2017.

113. [Let's talk about this whole Moon vs. Mars thing for human spaceflight.](#) *Planetary Society*, 1/26/2017.
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122. [John Day Fossil Beds could help search for water on Mars.](#) *The Oregonian*, 8/10/2012.
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124. [Martian Volcanic Glass Could Be Hotspot for Life.](#) *Astrobiology Magazine*, 4/26/2012.
125. [Mysteriously dark Mars regions are made of glass.](#) *New Scientist*, 4/15/2012.
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## Professional Service and Outreach

2024	<i>Organizing Committee</i> , 8 <sup>th</sup> Intl Conference on Mars Polar Science
2024	<i>Organizing Committee</i> , 10 <sup>th</sup> Intl Conference on Mars
2023-present	<i>Associate Editor</i> , Mars 2020 Fan Front Special Issue, JGR – Planets
2023-present	<i>Chair</i> , Purdue EAPS Undergraduate Committee
2023-present	<i>Elected Member</i> , Purdue EAPS Executive Committee
2023	<i>Invited Talks</i> : Indianapolis Sciencetech, Purdue Science Student Council
2022-2023	<i>Co-chair</i> , Mars Concurrent Exploration Science Analysis Group (MCE-SAG)
2022	<i>Keynote Speaker</i> , Indiana STEM Education Conference
2022	<i>Organizing Committee</i> , Science Objectives for Human Exploration of Mars
2022	<i>Invited Talks</i> : Purdue Undergraduate Research Association, Indiana 4-H
2021-2023	<i>Invited Member</i> , Purdue Provost's Committee on Diversity and Inclusion
2021-present	<i>Elected Member</i> , Purdue College of Science Faculty Council
2021	<i>Invited Talks</i> : Rotary Club of Greater Lafayette, Purdue Women's Network, Chicago Astronomical Society, Indiana 4-H
2021	<i>Invited Speaker</i> , Planetary Science Decadal Survey Panel on Mars
2020-2022	<i>Chair</i> , Purdue EAPS Code of Conduct Ad Hoc Committee
2020-present	<i>Steering Committee</i> , NASA Mars Exploration Program Analysis Group (MEPAG)
2020	<i>Invited Speaker</i> , Purdue Honors College Visiting Scholars
2020-present	<i>Founding Member</i> , Association of Women Geoscientists, Central IN chapter
2019-2020	<i>Invited Member</i> , NASA Mars Strategic Architecture Committee (MASWG)
2019	<i>Organizing Committee</i> , 9 <sup>th</sup> Intl Conference on Mars
2018-2020	<i>Elected Member</i> , Purdue EAPS Executive Committee
2018-2020	<i>Goals Committee</i> , NASA Mars Exploration Program Analysis Group (MEPAG)

2018 *Organizing Committee*, Mars Amazonian Climate Workshop  
 2017-2018 *Invited Member*, International Mars Sample Return Objectives and Samples Team, International Mars Exploration Working Group  
 2017 *Invited Study Participant*, Keck Institute for Space Studies, Caltech  
 2017 *Instructor*, Wabash Area Lifetime Learning Association  
 2016-2019 *Co-Organizer*, LPSC Early Career Planetary Faculty Lunch  
 2015-2016 *Organizing Committee*, 6<sup>th</sup> Intl. Mars Polar Conference  
 2015-2019 *Member*, Mars 2020 PSG Landing Site Working Group  
 2015-2016 *Organizing Committee*, Biosignature Preservation Workshop  
 2014-2015 *Organizing Committee*, 4<sup>th</sup> Intl Planetary Dunes Workshop  
 2014-present *Member*, Purdue EAPS Diversity, Equity, and Inclusion Committee  
 2012-2013 *Organizer*, Salt River Pima-Maricopa Indian Community Science Fair  
 2011-2012 *Organizing Committee*, Third Planetary Dunes Workshop  
 2010-present *Review panelist*, NASA funding programs  
 2010-2014 *Instructor and Advisor*, Mars Student Imaging Program, ASU  
 2008-present *Referee*, JGR, Astrobiology, Icarus, Nature, Science, EPSL, GRL, etc.  
 2008 *Organizing Committee*, 40<sup>th</sup> AAS Division of Planetary Science Meeting  
 2007-2009 *Initial Contacts Chair*, Expanding Your Horizons Youth Conference, Cornell  
 2006-2009 Cornell Graduate and Professional Student Assembly  
*Co-founder*, Student Advocacy Committee  
*Assembly Member* for the Physical Sciences  
*Council of Representatives Member* for the Department of Astronomy  
 2007-2008 *Vice President*, Cornell Graduate Women in Physics  
 2006-2008 *Chair*, Cornell Department of Astronomy Planetary Lunch Seminar  
 2006-2008 *Founding VP and President*, Cornell Astronomy Graduate Network