

Michelle S. Thompson

Curriculum Vitae

Purdue University
Department of Earth, Atmospheric, and Planetary Sciences
550 Stadium Mall Drive
West Lafayette, IN, 47907

mthompson@purdue.edu
T: 765-494-8677

EDUCATION

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| 2016 | Ph.D. in Planetary Sciences, Lunar and Planetary Laboratory (LPL)
Minor in Geosciences
University of Arizona, Tucson, AZ |
| 2013 | M.Sc. in Planetary Sciences, LPL
University of Arizona, Tucson, AZ |
| 2011 | B.Sc. in Geological Engineering, first class honors
B.Sc. in Biology, with distinction
Queen's University, Kingston, Ontario, Canada |

RESEARCH INTERESTS

I am interested in understanding the alteration of planetary materials after their formation, specifically the evolution of airless body surfaces. I study these phenomena using a combination of experimental techniques and returned sample analyses. I use advanced transmission electron microscopy methods, including experimental in situ techniques to answer my research questions. This work is directly applicable to samples already returned by the Apollo and Hayabusa missions, and is relevant for the ongoing OSIRIS-REx and Hayabusa2 missions.

EXPERIENCE

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| 2018 – Present | Assistant Professor of Planetary Sciences
Purdue University
Department of Earth, Atmospheric, and Planetary Sciences |
| 2016 – 2018 | NASA Postdoctoral Fellow
Astromaterials Research and Exploration Science
NASA Johnson Space Center |
| 2017 | NASA Jet Propulsion Laboratory (JPL)
Planetary Science Summer Seminar
Deputy PI: Centaur Reconnaissance Mission |
| 2011 – 2016 | Graduate Research Assistant/Associate
LPL, Department of Planetary Science
University of Arizona |

2014	Lloyd V. Berkner Space Policy Intern Space Studies Board National Academy of Sciences
2011 and 2009	Research Assistant Lunar and Planetary Institute NASA Johnson Space Center
2010 and 2008	Research Assistant Queen's University Royal Ontario Museum

HONORS AND AWARDS

2020	NASA Early Career Fellow
2019	Queen's University, <i>Excellence in Engineering</i> , Alumni Award
2018	Among the top 20 most downloaded papers for the <i>Meteoritics and Planetary Science</i> Journal between 2016 and 2017
2017	Canadian Space Agency Astronaut Candidate Finalist (top 32 of 3776)
2017	Microanalysis Society Postdoctoral Scholar Award
2016 - 2018	NASA Postdoctoral Fellowship
2016	Joseph Goldstein Scholar Award from the Microanalysis Society
2016	Geological Society of America Dwornik Student Paper Award Best Graduate Student Oral Presentation Lunar and Planetary Science Conference
2016	Lunar and Planetary Laboratory Outstanding Scholar Award
2014 - 2016	NASA Earth and Space Science Fellowship
2015	Wiley Award for Outstanding Student Presentation Meteoritical Society Meeting
2015	NASA Student Travel Award, Meteoritical Society Meeting
2015 and 2013	College of Science Galileo Scholarship, University of Arizona
2014	<i>Earth, Planets, and Space</i> Highlighted Paper of 2014
2014	Geological Society of America Dwornik Student Paper Award Honorable Mention for Graduate Student Oral Presentation Lunar and Planetary Science Conference
2014	Shandel Fund Travel Award Lunar and Planetary Laboratory
2014	Microanalysis Society Meeting Scholar Microscopy and Microanalysis Conference

2014	Lunar and Planetary Institute Career Development Award
2013	Best Graduate Student Talk Lunar and Planetary Laboratory Conference
2012 – 2015	Natural Sciences and Engineering Research Council of Canada Post-Graduate Scholarship – Doctoral Level
2011 – 2012	Natural Sciences and Engineering Research Council of Canada Post-Graduate Scholarship – Master’s Level
2011	Mineralogical Association of Canada Student Award
2011	Book Prize for Student Leadership, Queen’s University
2010	Best Poster Presentation, Rising Stars of Research Conference, University of British Columbia

PEER-REVIEWED JOURNAL ARTICLES

Laczniaik, D. L., **Thompson, M. S.**, Dukes, C. A., Morris, R. V., Clemett, S. J., Keller, L. P., and Christoffersen, R. 2021. Characterizing the spectral, microstructural, and chemical effects of solar wind irradiation on the Murchison carbonaceous chondrite through coordinated analyses. *Icarus (In review)*.

Trang, D., **Thompson, M.S.**, and 17 co-authors. The Role of Hydrated Minerals and Space Weathering Products in the Bluing of Carbonaceous Asteroids. *Planetary Science Journal (Accepted)*.

Thompson, M.S., Clemett, S.J., Morris, R.V., Loeffler, M.J., Trang, D., Keller, L.P., Christoffersen, R., and Agresti D.G. 2020. The Effect of Progressive Space Weathering on the Spectral, Chemical, and Microstructural Properties of Organic and Inorganic Components of Carbonaceous Chondrites. *Icarus*: 113775.

Prince, B.S., Magnuson, M.P., Chaves, L.C., **Thompson, M.S.**, and Loeffler, M.J. 2019. Space Weathering of FeS Induced via Pulsed Laser Irradiation. *Journal of Geophysical Research – Planets* 125: e2019JE006242.

Vander Kaaden, K.E., McCubbin, F.M., Byrne, P.K., Chabot, N.L., Ernst, C.M., Johnson, C.L., and **Thompson, M.S.** 2019. Revolutionizing our Understanding of the Solar System via Sample Return from Mercury. *Space Science Reviews* **215**: 49.

Hyde, B. C., Tait, K.T., Moser, D.E., Rumble II, D., and **Thompson, M.S.** 2020. Impact Accretion of Achondritic Material: A Preserved Example in the L Chondrite Breccia Northwest Africa 869. *Meteoritics and Planetary Science* **55**: 20-35.

Thompson, M.S., Keller, L.P., Christoffersen, R., Loeffler, M.J., Morris, R.V., and Rahman, Z. 2019. Spectral and chemical effects of simulated space weathering of the Murchison CM2 carbonaceous chondrite. *Icarus* **319**: 499-511.

Howell, S.M., Chou, L, **Thompson, M.S.**, et al. 2018. Camilla: A Centaur reconnaissance and impact mission concept. *Planetary and Space Science* **164**: 184-193.

Thompson, M.S., Zega, T.J., and Howe, J.Y. 2017. In situ experimental formation and growth of Fe nanoparticles and vesicles in lunar soil. *Meteoritics and Planetary Science* **52**: 413-427 (Cover).

Thompson, M.S., Zega, T.J., Becerra, P., Keane, J.T., and Byrne, S. 2016. The Oxidation State of Nanophase Fe Particles in Lunar Soil: Implications for Space Weathering. *Meteoritics and Planetary Science* **51**: 1082-1095.

Bolser, D., Zega, T.J., Asaduzzaman, A., Bringuier, S., Simon, S., Grossman, L., **Thompson, M.S.**, and Domanik K. J. 2016. Microstructural analysis of Wark-Lovering Rims in the Allende and Axtell CV3 chondrites: Implications for high-temperature nebular processes. *Meteoritics and Planetary Science* **51**: 743-756.

Thompson, M.S., Christoffersen, R., Zega, T.J., and Keller, L.P. 2014. Microchemical and structural evidence for space weathering in soils from asteroid Itokawa. *Earth, Planets and Space* **66**:89.

BOOK CHAPTERS

Vander Kaaden, K.E.,* McCubbin, F.M., Byrne, P.K., Chabot, N.L., Ernst, C.M., Johnson, C.L., and **Thompson, M.S.** 2020. Revolutionizing our Understanding of the Solar System via Sample Return from Mercury. Chapter in *Role of Sample Return in Addressing Major Questions in Planetary Sciences*.

Denevi, B. W., Noble, S.K., Blewett, D. T., Christoffersen, R., Garrick-Bethell, I., Gillis-Davis, J.J., Glotch, T. D., Greenhagen, B. T., Hendrix, A. R., Hurley, D. M., Keller, L. P., Kramer, G. Y., **Thompson, M. S.**, and Trang, D. 2018. Space Weathering and Exosphere–Surface Interactions. *New Views of the Moon 2*. Reviews in Mineralogy and Geochemistry (in review).

CONFERENCE ABSTRACTS

Ernst, C. E., Chabot, N. L., Klima, R. L., Kubota, S., Rogers, G., Byrne, P. K., Huack II, S. A., Vander Kaaden, K. E., Vervack, R. J., Besse, S., Blewett, D. T., Denevi, B., Goossens, S., Indyk, S. J., Izenberg, N. R., Johnson, C. L., Jozwiak, L. M., Korth, H., McNutt, R. L., Murchie, S. L., Peplowski, P. N., Raines, J. M., Rampe, E. B., **Thompson, M. S.**, and Weider, S. Z. 2021. Mercury Lander: Transformative Science from the Surface of the Innermost Planet. 52nd Lunar and Planetary Science Conference. Abstract 2565.

Thompson, M. S., Laczniak, D. L., Morris, R. V., Clemett, S. J., Loeffler, M. J., Dukes, C. A., Trang, D., Keller, L. P., and Christoffersen, R. Understanding the Space Weathering of Returned Samples through Coordinated Analysis. Royal Astronomical Society Meeting Conference on the Analysis of Returned Extraterrestrial Samples.

Thompson, M. S., Vander Kaaden, K. E., Loeffler, M. J., and McCubbin, F. M. 2021. Understanding the Space Weathering of Mercury through Laboratory Experiments. 52nd Lunar and Planetary Science Conference. Abstract 1496.

- Glotch, T. D., Thompson, M. S., Dukes, C. A., and Loeffler, M. J. 2021. Micro-FTIR Imaging and Spectroscopy of Experimentally Space Weathered CM2 Chondrite Murchison. 52nd Lunar and Planetary Science Conference. Abstract 2004.
- Thompson, M. S.**, McGlaun, M. L.,^U Vander Kaaden, K. E., Loeffler, M. J., and McCubbin, F. M. 2020. Coordinated Analysis of Mercury Analog Samples Subjected to Simulated Space Weathering. Microscopy and Microanalysis (22) 2594-2597.
- Chaves, L. C., **Thompson, M. S.**, Shuvo, S. N. 2021. Space weathering features in a sulfide grain from asteroid Itokawa. 52nd Lunar and Planetary Science Conference. Abstract 1770.
- Chaves, L. C., **Thompson, M. S.**, Loeffler, M. J. 2020. Investigating the role of sulfides in the space weathering of carbonaceous chondrites. Microscopy and Microanalysis, 26.
- Chaves, L. C., **Thompson, M. S.**, Loeffler, M. J. 2020. Micrometeorite bombardment simulation on Murchison meteorite: The role of sulfides in the space weathering of carbonaceous chondrites. 51st Lunar and Planetary Science Conference. Abstract 1670.
- Lacznia, D. L., **Thompson, M. S.**, Christoffersen, R., Dukes, C. A., Clemett, S. J., Morris, R. V., Keller, L. P. 2021. Understanding space weathering of carbonaceous asteroids through H⁺ and He⁺ ion irradiation of the Murchison meteorite. 52nd Lunar and Planetary Science Conference, Abstract 2361.
- Lacznia, D. L., **Thompson, M. S.**, Dukes, C. A., Morris, R. V., Clemett, S. J., Keller, L. P., and Christoffersen, R. 2020. Preparing for C-complex Asteroid Sample Return: Investigating Space Weathering Effects Using Coordinated Analysis of a H⁺- and He⁺-Irradiated Carbonaceous Chondrite. Microscopy and Microanalysis 2020 Meeting.
- Thompson, M.S.**, McGlaun, M.L., Vander Kaaden, K.E., Loeffler, M.J., and McCubbin, F.M. 2020. Simulated micrometeoroid impacts to understand the progressive space weathering of Mercury. Lunar and Planetary Science Conference. Abstract 1659.
- Lacznia, D.L., **Thompson, M.S.**, Dukes, C.A., Morris, R.V., Clemett, S.J., Keller, L.P., and Christoffersen, R. 2020. Preparing for C-Complex Asteroid Sample Return: Investigating Space Weathering Effects using Coordinated Analyses of He⁺- and H⁺-Irradiated Carbonaceous Chondrite. Lunar and Planetary Science Conference. Abstract 2667.
- Trang, D., **Thompson, M.S.**, Clark, B.E., Kaplan, H.H., Zou, X.D., Li, J.Y., Ferrone, S., Hamilton, V.E., Simon, A.A., Reuter, D.C., Keller, L.P., Barucci, M.A., Campins, H., Lantz, C., Jawin, E.R., Connolly, H.C. Jr., Walsh, K.J., and Lauretta, D.S. 2020. The Radiative Transfer Modeling Perspective of Space Weathering on (101955) Bennu: Resolving the Reddening and Bluening Conundrum. Lunar and Planetary Science Conference. Abstract 1653.
- Chaves, L.C., **Thompson, M.S.**, Loeffler, M. J. 2020. Micrometeorite bombardment simulation on Murchison meteorite: the role of sulfides in the space weathering of carbonaceous chondrites. Lunar and Planetary Science Conference. Abstract 1670.
- Thompson, M. S.**, Lacznia, D. L., Morris, R. V., Clemett, S. J., Loeffler, M. J., Dukes, C. A., Trang, D.,

- Keller, L. P., Chirstoffersen, R. and Agresti, D. 2019. The Effects of Space Weathering on the Organic and Inorganic Components of a Carbonaceous Chondrite: Implications for Returned Samples for Hayabusa2 and OSIRIS-REx. *Asteroids Workshop*.
- Trang, D., Clark, B. E., Kaplan, H. H., **Thompson, M. S.**, Ferrone, S., Simon, A. A., Keller, L. P., Connolly Jr, H. C., Walsh, K. J., and D. S. Lauretta. 2019. Space Weathering Maps of (101955) Bennu Using a Radiative Transfer Model. *Asteroids Workshop*.
- Clark, B.E., and 27 co-authors including **Thompson. M. S.**, 2019. Overview of the Search for Space Weathering Signals on Bennu: One Rock Type, or Two? *Asteroids Workshop*.
- Thompson, M.S.**, Loeffler, M.J., Morris, R.V., Clemett, S.J., Trang, D., Keller, L.P., Christoffersen, R. and Agresti, D. 2019. Investigating the Effects of Simulated Micrometeorite Impacts on a Carbonaceous Chondrite Through Coordinated Analysis. 82nd Annual Meeting of The Meteoritical Society Abstract 6318.
- Clark, B.E., Ferrone, S.M., Kaplan, H.H., Zou, X.-D., Trang, D., DellaGiustina, D.N., LeCorre, L., Golith, D.R., Li, J.-Y., Ballouz, R.-L., Hergenrother, C.W., Rizk, B., Burke, K.N., Bennett, C.A., Keller, L., Howell, E.S., Lantz, C., Barucci, M.A., Fornasier, S., **Thompson, M.S.**, and 8 authors. 2019. Overview of the Search for Space Weathering Signals on Bennu: one Rock Type, or Two? Asteroid Science in the Age of OSIRIS-REx and Hayabusa2 Conference Abstract.
- Trang, D., Clark, B.E., Kaplan, H.H., **Thompson, M.S.**, and 6 authors. 2019. Space Weathering Maps of 101955 Bennu using a Radiative Transfer Model. Asteroid Science in the Age of OSIRIS-REx and Hayabusa2 Conference Abstract.
- Chaves, L.C., **Thompson, M.S.** and Loeffler, M.J. 2019. Understanding the Role of Sulfides in the Space Weathering of Asteroidal Regoliths. 82nd Annual Meeting of The Meteoritical Society, Abstract 6404.
- Laczniak, D.L., **Thompson, M.S.**, Dukes, C.A., Morris, R.V., Clemett, S.J., Keller, L.P. and Christoffersen, R. 2019. Coordinated Analysis of an Ion Irradiated Carbonaceous Chondrite. 82nd Annual Meeting of The Meteoritical Society Abstract 6434.
- Haenecour, P., **Thompson, M.S.**, Zega, T. J., Howe, J. Y., and Chen, W-Y. 2019 In-situ Ion Irradiation and Heating Experiments in the Transmission Electron Microscope: Simulations of Dust Processing in Circumstellar Environments. Microscopy and Microanalysis Conference.
- Haenecour, P., Howe, J.Y., Zega, T.J., Sunaoshi, T., **Thompson, M.S.**, Dogel, S., and Sagar, J. 2019. Thermal Alteration of Organics and Volatiles in Carbonaceous Chondrites: Insights from In-Situ Heating Experiments. Lunar and Planetary Science Conference. Abstract 1469.
- Thompson, M.S.**, Haenecour, P., Howe, J.Y., Laczniak, D.L., Zega, T.J., Hu, J., Chen, W., Keller, L.P., and Christoffersen, R. 2019. Simulating Space Weathering in the Transmission Electron Microscope via Dynamic In Situ Heating and Helium Irradiation of Olivine. Lunar and Planetary Science Conference. Abstract 1425.
- Laczniak, D.L., **Thompson, M.S.**, Dukes, C.A., Morris, R.V., Clemett, S.J., Keller, L.P., Christoffersen R. 2019. Coordinated Analysis of an Ion Irradiated Carbonaceous Chondrite Suggests Complex

Space Weathering Effects. Lunar and Planetary Science Conference. Abstract 1972.

Thompson, M.S., Loeffler, M.J., Morris, R.V., Clemett, S.J., Trang, D., Keller, L.P., Christoffersen, R., and Agresti, D.G. 2019. Coordinated Analysis of an Experimentally Space Weathered Carbonaceous Chondrite. Lunar and Planetary Science Conference. Abstract 2045.

McGlaun, M.L., **Thompson, M.S.**, Vander Kaaden, K.E., Loeffler, M.J., McCubbin, F.M., Rahman, Z., and Haenecour, P. 2019. Understanding the Space Weathering of Mercury via Simulation of Micrometeorite Impacts. Lunar and Planetary Science Conference. Abstract 2019.

Denevi, B.W., Costello, E.S., Ghent, R.R., Ghent, Glotch, T.D., Greenhagen, B.T., Hayne, P.O., Lucey, P.G., Noble, S.K., Robinson, M.S., Speyerer, E.J., and **Thompson, M.S.** 2019. The Lunar Regolith as Understood from Near and Far. Lunar and Planetary Science Conference. Abstract 2019.

Daly, L., Lee, M.R., Hallis, L.J., Bland, P.A., Reddy, S.M., Saxey, D.W., Wickard, W.D.A., Fougereuse, D., Timms, N.E., Jourdan, F., Cox, M., Salge, T., Ishii, H.A., Bradley, J.P., Aguiar, J., Hattar, K., Keller, L.P., **Thompson, M.S.**, and Christoffersen, R. 2018. The origin of hydrogen in space weathered rims of Itokawa regolith particles. Hayabusa Symposium.

Thompson, M.S., Keller, L.P., Loeffler, M.J., Morris, R.V., Clemett, S.J., and Christoffersen R. 2018. Preparing for Sample Return: Coordinated Analysis of Experimentally Space Weathered Carbonaceous Chondrites. Geological Society of America Meeting, Abstract 284-11.

Loeffler, M. J., **Thompson, M.S.**, and Keller, L.P. 2018. Space Weathering of Carbonaceous Asteroids and Meteorites. American Geophysical Union Meeting Abstract.

Thompson, M.S., Loeffler, M.J., Morris, R.V., Clemett, S.J., Christoffersen, R., Rahman, Z., Agresti, D.G. and Keller, L.P. 2018. Coordinated Analyses of the Chemical and Microstructural Effects of Progressive Space Weathering of a Carbonaceous Chondrite. *Microscopy and Microanalysis*, 24, p.2118-2119.

Rahman, Z.; Keller, L.P. Nguyen, A.N., **Thompson, M.S.**, and Messenger, S.R. 2018. Novel Applications of Focused Ion Beam Technique for Planetary Sample Analyses. *Microscopy and Microanalysis*, 24, p. 2120-2121.

Barnes, J.J. Thompson, M.S. McCubbin, F.M. Howe, J.Y. Rahman, Z. Messenger, S. and Zega, T.J. 2018. Coordinated Microanalysis of Phosphates in High-Titanium Lunar Basalts. *Microscopy and Microanalysis*, 24, p. 2078-2079.

Thompson, M.S., Loeffler, M.J., Morris, R.V., Clemett, S. J., Christoffersen, R., Agresti, D.G., and Keller, L.P. 2018. Simulating Progressive Space Weathering of a Carbonaceous Chondrite via Pulsed Laser Irradiation. Lunar and Planetary Science Conference. Abstract 2408.

Barnes, J.J., **Thompson, M.S.**, McCubbin, F.M., Howe, J.Y. Rahman, Z., Messenger, S., and Zega, T.J. 2018. Coordinated Microanalysis of Phosphates in Apollo 11 High-Titanium Basalts. Lunar and Planetary Science Conference. Abstract 2667.

Keller, L.P., Howe, J.Y., Rahman, Z., **Thompson, M.S.**, and Zega, T.J. 2018. In Situ Heating Experiments on Patina Coated Lunar Rock 76015. Lunar and Planetary Science Conference. Abstract 2594.

- Vander Kaaden, K.E., Hogancamp, J.V., **Thompson, M.S.**, Jagge, A.M., Hollier, A. B., and Danielson, L.R. 2018. Supporting Women in STEM Fields: The Importance of Female-Led and Female-Populated Organizations. Women in Planetary Science and Exploration Conference.
- Thompson, M.S.**, Keller, L.P., Christoffersen, R., Loeffler, M.J., Morris, R.V., and Rahman, Z. 2017. Simulating Space Weathering of a Carbonaceous Chondrite via Pulsed Laser Irradiation. JAXA Hayabusa Sample Symposium.
- Barnes, J., **Thompson, M.S.**, McCubbin, F., Boyce, J., Messenger, S., Rahman, Z., Keller, L., and Zega, T.J. 2017. Coordinated microanalysis of the chemical composition, microstructure and volatile inventory of lunar apatite. Geological Society of America Conference.
- Thompson, M.S.**, Keller, L.P., Christoffersen, R., Loeffler, M.J., Morris, R.V., Graff, T.G., and Rahman, Z. 2017. Nanoscale Analyses of a Carbonaceous Chondrite Exposed to Simulated Space Weathering Conditions. Goldschmidt Conference.
- Thompson, M.S.**, Keller, L.P., Christoffersen, R., Loeffler, M.J., Morris, R.V., Graff, T.G., and Rahman, Z. 2017. Transmission Electron Microscopy Studies of Carbonaceous Chondrites which Experienced Experimentally Simulated Space Weathering Effects. *Microscopy and Microanalysis*, 23, p. 2138-2139.
- Howe, J.Y., **Thompson, M.S.**, and Zega T.J. 2017. In Situ Thermal Shock of Lunar and Planetary Materials Using a Newly Developed MEMS Heating Holder in a STEM/SEM. *Microscopy and Microanalysis*, 23, p. 66-67.
- Thompson, M.S.**, Keller, L.P., Christoffersen, R., Loeffler, M.J., Morris, R.V., Graff, T.G., and Rahman, Z. 2017. Analyzing the Chemical and Spectral Effects of Pulsed Laser Irradiation to Simulate Space Weathering of a Carbonaceous Chondrite. Lunar and Planetary Science Conference. Abstract 2799.
- Thompson, M.S.**, Zega, T.J., and Howe, J.Y. 2017. TEM Analysis of Space Weathering Features in an Itokawa Soil Grain with a Polyphasic Mineralogy. Lunar and Planetary Science Conference. Abstract 2358.
- Zega, T.J., **Thompson, M.S.**, and Howe, J.Y. 2017. Microstructural Analysis of a Soil Grain Returned from Asteroid Itokawa. Lunar and Planetary Science Conference. Abstract 3037.
- Thompson, M.S.**, Zega, T.J., and Howe, J.Y. 2016. In Situ Heating of Lunar Soil in the Transmission Electron Microscope: Simulating Micrometeorite Impacts. *Microscopy and Microanalysis*, 22, p. 1800-1801.
- Thompson, M.S.**, Zega, T.J., and Howe, J.Y. 2016. Simulation of Micrometeorite Impacts through In Situ Dynamic Heating of Lunar Soil. Lunar and Planetary Science Conference. Abstract 2744.
- Thompson, M.S.**, Zega, T.J., Keane, J.T., Becerra, P. and Byrne, S. 2015. The Oxidation State of Fe Nanoparticles in Lunar Soil: Implications for Space Weathering. Workshop on the Space Weathering of Airless Bodies. Abstract 2017.
- Thompson, M.S.**, and Zega, T.J. 2015. Simulation of Micrometeorite Impacts through in situ Dynamic Heating of Lunar Soil. Workshop on the Space Weathering of Airless Bodies. Abstract 2018.

- Thompson, M.S.**, and Zega, T.J. 2015. Simulation of Micrometeorite Impacts through in situ Dynamic Heating of Lunar Soils. Meteoritical Society Meeting Abstract 5389.
- Thompson, M.S.**, and Zega, T.J. 2015. The Oxidation State of Nanophase Fe Particles Produced by Space Weathering as Revealed through Aberration-Corrected Transmission Electron Microscopy. *Microscopy and Microanalysis*, 21, p. 1535-1536.
- Thompson, M.S.**, Zega, T.J., Keane, J.T., Becerra, P. and Byrne, S. 2015. The Oxidation State of Fe Nanoparticles in Lunar Soil: Implications for Space Weathering Processes. Lunar and Planetary Science Conference. Abstract 2932.
- Hyde, B.C., Tait, K.T., Rumble III, D., Izawa, M.R.M., **Thompson, M.S.**, Nicklin, I., and Gregory, D.A. 2015. Achondritic Impactor Clasts in Northwest Africa 869. Lunar and Planetary Science Conference. Abstract 1983.
- Thompson, M.S.** and Zega, T.J. 2014. Electron Energy-Loss Spectroscopy of Iron Nanoparticles in Lunar Soil using an Aberration-Corrected Scanning Transmission Electron Microscope. *Microscopy and Microanalysis*, 20, p. 1672-1673.
- Thompson, M.S.**, Christoffersen, R., Zega, T.J., and Keller, L.P. 2014. Nanoscale Analysis of Space Weathering Features in Soils from Itokawa. Lunar and Planetary Science Conference. Abstract 2121.
- Miller, K.E., **Thompson, M.S.**, Lauretta, D.S., and Zega, T.J. 2014. Conditions for Formation of Chalcopyrite in the Rumuruti Chondrites. Lunar and Planetary Science Conference. Abstract 1461.
- Thompson, M.S.** and Zega, T.J. 2014. Determining the Oxidation State of Iron Nanoparticles in Mature Lunar Soil through Electron Energy-Loss Spectroscopy. Lunar and Planetary Science Conference. Abstract 2834.
- Thompson, M.S.** and Zega, T.J. 2013. Microstructural and Chemical Analysis of Soils from Itokawa: Evidence for Space Weathering. Lunar and Planetary Science Conference. Abstract 2593.
- Thompson, M.S.**, Christoffersen, R., and Zega, T. J. 2013. Microchemical and Structural Evidence for Space Weathering in Soils from Itokawa. Hayabusa Sample Symposium.
- Thompson, M.S.**, Miller, K.E, Zega, T.J., and Lauretta, D.S. 2012. Nanostructural Analysis of a Sulfide Assemblage in an R Chondrite Meteorite via Large Solid-Angle EDS. Microscopy and Microanalysis Meeting Abstract.
- Thompson, M.S.**, Christoffersen, R., Noble, S.K., and Keller, L.P. 2012. Comparative Mineralogy, Microstructure and Compositional Trends in the Sub-Micron Size Fraction of Mare and Highland Lunar Soil. Lunar and Planetary Science Conference. Abstract 2384.
- Thompson, M.S.**, and Christoffersen, R. 2010. The Smallest Lunar Grains: Analytical TEM characterization of the sub-micron size fraction of a mare soil. Lunar and Planetary Science Conference. Abstract 2191.

Thompson, M.S., Rumble III, D., Tait, K.T., and Nicklin, I. 2011. Meteorite Northwest Africa (NWA) 869: A study of diverse clasts in the L 4-6 brecciated ordinary chondrite. Geological Association of Canada Abstract.

MISSION INVOLVEMENT

2019 – Present JAXA Hayabusa2 Mission Science Team
Fine-Grained Mineralogy/Petrology Committee

2019 – Present Mercury Lander, Science Team Member, Planetary Mission Concept Study

2018 – Present NASA OSIRIS-REx
Frequent science collaborator with the Space Weathering Working Group

INVITED TALKS

Invited Talk Understand Space Weathering of Carbonaceous Asteroids
Arizona State University Center for Meteorite Studies, June 2020

Invited Talk From Atomic Scales to Asteroid Surfaces: Understanding Space Weathering of
Airless Bodies through Coordinated Analyses
Indiana University – Purdue University Indianapolis, February 2020

Invited Talk Understanding Space Weathering of Airless Bodies through Returned
Sample Analyses
Washington University at St. Louis, February 2019

Invited Talk From Atomic Scales to Asteroid Surfaces: Understanding Space Weathering of
Airless Bodies through Coordinated Analyses
University of Chicago, October 2018

Invited Talk Setting My Sights on the Sky
NASA Education Downlink Event for the International Space Station
Queen's University, April 2018

Invited Talk Observing the Evolution of the Moon through a Microscope: Simulating
Micrometeorite Impacts Through in-situ Heating of Lunar Soils.
Microscopy and Microanalysis Conference, Hitachi, August 2016

Invited Talk Simulation of Micrometeorite Impacts through In Situ Dynamic Heating of
Lunar Soil.
In-situ Heating in Aberration-Corrected STEM Workshop, Georgia Tech, 2016

Invited Talk The Oxidation State of Nanophase Fe Particles Produced by Space
Weathering as Revealed Through Aberration-Corrected Transmission
Electron Microscopy.
Microscopy and Microanalysis Conference, August 2015.

- Invited Talk** Understanding Space Weathering of Asteroids and the Lunar Surface: Analysis of Samples from the Hayabusa and Apollo Missions. *Naval Research Laboratory, Washington D.C., November 2014.*
- Invited Talk** Understanding Space Weathering of Asteroids and the Lunar Surface: Analysis of Samples from the Hayabusa and Apollo Missions. *Carnegie Institution, Washington D.C., October 2014.*
- Invited Talk** Microchemical and Structural Evidence for Space Weathering in Soils from asteroid Itokawa. *Japanese Aerospace Exploration Agency (JAXA) Hayabusa Symposium, 2013.*
- 2012 and 2013 Graduate Student Colloquium, Lunar and Planetary Laboratory
- 2011 Keynote Address, Queen's University Alumni Conference

MEMBERSHIPS AND SERVICE

- 2021 Session Convener, Microscopy and Microanalysis Conference
- 2021 Session Convener, Goldschmidt Conference
- 2020 Manuscript Reviewer, Icarus, Journal of Geophysical Research - Planets
- 2020 Coordinator for NASA Planetary Science Division Early Career Round Table Discussion with NASA Associate Administrator Dr. Thomas Zurbuchen
- 2020 - 2022 Strategic Planning Committee for the Microscopy and Microanalysis Conference
- 2019 - 2022 Curation and Analysis Planning Team for Extraterrestrial Materials (CAPTEM) Meteorite Working Group (MWG) Member
- 2019 - 2021 Director (elected), Microanalysis Society (MAS) of America
- 2019 Manuscript Reviewer: Nature Astronomy
- 2019 Manuscript Reviewer: Meteoritics and Planetary Science
- 2019 Manuscript Reviewer: Journal of Purdue Undergraduate Research
- 2019 Lunar and Planetary Science Conference (LPSC) Program Committee Lead for Space Weathering, Contributor to Mission and Instrument Concepts
- 2018 - 2020 Diversity Committee, Department of Earth, Atmospheric and Planetary Sciences, Purdue University
- 2018 - 2020 Graduate Committee, Department of Earth, Atmospheric and Planetary Sciences, Purdue University

2017, 2019	Geological Society of America Dwornik Award Judge
2017, 2019	LPSC Session Chair
2017 - 2020	Manuscript Reviewer: Journal of Geophysical Research, Planets, Icarus
2018	Session Convener, Session Chair, Geological Society of America Conference
2018, 2020	Session Convener, Session Chair, Microscopy and Microanalysis Conference
2017 2016 - 2020	Secretary for the Supporting Women at NASA (SWAN) group Panel Chief, Panel Member NASA Review Panels
2015	Organizing Committee for the Workshop on Space Weathering of Airless Bodies
2014	Organizer: Sharing the Adventure with the Student: Exploring the Intersections of NASA Space Science and Education: A Workshop run by the National Academy of Sciences
2014	Coordinator for LPL Graduate Student Policy Discussion with Dr. Jim Green, NASA Planetary Science Division Director
2012 – 2014	Coordinator for the Lunar and Planetary Laboratory Conference
2012 – 2014	Coordinator for the Graduate Student Academic Career Seminar Series, LPL
2015 – Present	Member of the Microanalysis Society of America
2014 – Present	Member of the Meteoritical Society
2012 – Present	Member of the Microscopy Society of America

PROFESSIONAL DEVELOPMENT

2020	Safe Zone and Trans Inclusion Training Trained to be a better ally for the LGBTQ+ community. Coordinated by the Purdue LGBTQ+ Center.
2018	Course and Curriculum Based Undergraduate Research Workshop Participant, Geological Society of America Meeting <i>Designing and implementing research opportunities for undergraduate students in core course curricula</i>
2018	National Center for Faculty Diversity and Development Faculty Success Program <i>Participated in weekly meetings and skills-based workshops to improve faculty skills including time management, mentoring, strategic planning</i>

TEACHING

- 2021 Instructor for Planetary Science Capstone Course, Purdue University
Developed and taught lectures for 16 Senior Planetary Science Majors on the historical perspective of lunar exploration through modern day planetary science missions. Facilitated students proposing their own missions.
- 2020 Instructor for Geo- and Cosmochemistry, Purdue University
Developed and taught lecture for 15 undergraduate and graduate students on the principles of geochemical system and the cosmochemical evolution of the solar system.
- 2020 Instructor for EAPS 591: Laboratory Analysis of Earth and Planetary Materials, Purdue University
Developed and taught lectures for 18 undergraduate and graduate students on analytical laboratory techniques.
- 2019 Instructor for EAPS 243: Earth Materials I, Purdue University
Developed and taught lectures and labs for 35 undergraduate majors on topics including systematic mineral classification, optical microscopy, etc.
- 2019 Instructor for EAPS 591: Planetary Materials, Purdue University
Developed and taught lectures for 35 undergraduate and graduate students on topics including mineralogy, crystallography, cosmochemistry, etc.
- 2018 Instructor for the Small Particle Handling Workshop, Lunar and Planetary Institute and Johnson Space Center
Instructed four students on ultramicrotomy and small particle handling techniques
- 2013 Teaching Assistant for PTYS 170A1: Evolution of a Habitable World, LPL
Presented lectures, led students through in-class activities, graded coursework and tutored students during office hours and review sessions
- 2012 Teaching Assistant for PTYS 214: Astrobiology: A Planetary Perspective, LPL
Presented guest lectures, provided review sessions, graded coursework, and designed and implemented in-class activities for students
- 2009 – 2011 Teaching Assistant for GEOL 232: Mineralogy, Queen's University
Prepared and taught lab sessions on optical mineralogy, basic crystallography, graded coursework and tutored students during office hours
- 2008 Teaching Assistant for APSC 151: The Earth's Physical Environment, Queen's University
Prepared and taught lab sessions on basic geological engineering concepts, graded coursework

MENTORSHIP

PhD Students Advised:

2020 – Present Alexander Kling
2019 – Present James McFadden
2018 – Present Laura Chaves
2018 – Present Dara Laczniak

Undergraduate Students Advised:

2021 – Present Victor Mosqueda
2020 - Present Maizey Benner
2020 - Present Amina Patterson
2019 - Present Phoebe Kinzelman
2018 - 2019 Madison McGlaun
2018 Bryan Howl

Student Committees:

2021 – Present: Tai-Jan (Ted) Huang, PhD program
2021 – Present: Moshammat Miijum, PhD program
2020 – Present Disha Ohkai, PhD program
2019 – Present Amanda Rudolph, PhD program
2019 – Present Brad Garczynski, PhD program
2019 – Present Jennifer Pouplin, PhD program
2018 Sheridan Ackiss, PhD
2018 Kevin Graves, PhD

2015-2016 NASA Space Grant Program Intern Adviser
Created and supervised a research project for an undergraduate student at LPL

CURRENT SUPPORT

NASA Solar System Workings Program, 2020

Title: *Investigating the Role of Sulfides and Fe-Oxide Minerals in the Space Weathering of Asteroidal Regoliths*

PI: Michelle Thompson

Value: \$466,381

NASA Early Career Fellowship, 2020

Title: *Laboratory studies of the Evolution of Airless Planetary Surfaces (LEAPS)*

PI: Michelle Thompson

Value: \$99,997

NASA Solar System Workings Program, 2019

Title: *Quantifying Solar Wind-Derived Water in Space Weathered Lunar Soils*

PI: Michelle Thompson

Value: \$599,015

Purdue Instructional Equipment Grant Program, 2019

Title: *Enabling Active Learning Across the Curriculum with a Tabletop Scanning Electron Microscope*

PI: Michelle Thompson

Value: \$135,000

NASA Planetary Mission Concept Studies, 2019

Title: *Mercury Lander*

PI: Carolyn Ernst, Collaborator: Michelle Thompson

Value: \$142,316

NASA Laboratory Analysis of Returned Samples Program, 2019

Title: *Combining Novel Experimental Techniques with Returned Sample Analyses to Better Understand the Space Weathering of Planetary Surfaces*

PI: Michelle Thompson

Value: \$348,662

NASA Apollo Next Generation Sample Analysis Program, 2019

Title: *Consortium for the Advanced Analysis of Apollo Samples*

PI: Charles Shearer, Co-I: Michelle Thompson

Value: \$190,148 to Co-I Thompson

NASA Solar System Workings Program, 2018

Title: *An Experimental Investigation of Space Weathering Processes of Regoliths on Primitive Carbonaceous Asteroids*

PI: Michelle Thompson

Value: \$636,818

NASA Postdoctoral Program Fellowship, 2016

Title: *Understanding Space Weathering of Carbonaceous Asteroids: Analysis of Experimental Analog Samples in Preparation for Results from Dawn at Ceres, and the OSIRIS-REx and Hayabusa2 Sample Return Missions*

PI: Michelle Thompson, Adviser: Lindsay Keller

Value: \$160,000

NASA Earth and Space Science Fellowship, 2015

Title: *Understanding Space Weathering of Asteroids and the Lunar Surface: Analysis of Experimental Analogs and Samples from the Hayabusa and Apollo Missions*

PI: Dr. Tom Zega, Graduate Student: Michelle Thompson

Value: \$90,000

Natural Sciences and Engineering Research Council of Canada Post-Graduate Scholarship

Title: *Understanding Meteorite Analogs in preparation for OSIRIS-REx*

PI: Michelle Thompson, Adviser: Dr. Tom Zega

Value: \$90,000

SELECTED SAMPLE PROPOSALS

Lunar Sample Proposal, NASA

Quantifying Water in Space Weathered Lunar Soils

PI: Michelle Thompson, 2 lunar soils awarded

Hayabusa Sample Proposal, Japanese Aerospace Exploration Agency (JAXA) 4th Announcement of Opportunity for Hayabusa Samples

Understanding the Microstructural and Chemical Signatures of Space Weathering in Sulfide Minerals
PI: Michelle Thompson, 5 particles awarded

PUBLIC OUTREACH

2019, 2020	Volunteer Speaker on Topics in Space Exploration for 120 high school students at Cobourg Collegiate Institute
2019	Speaker for Purdue Undergraduate Research Program
2017 – 2019	Volunteer for Letters to a Pre-Scientist Program which serves low-income elementary school children
2012- Present	Volunteer Speaker for Careers in Science, low-income and rural schools in the US and Canada
2017	Volunteer Speaker for Careers in the Geosciences, University of Toronto
2016	Volunteer Speaker for Space Drafts: Public Lecture Series
2015	Volunteer for the Art of Planetary Science Event, LPL
2015	Volunteer for Bennuval: An Evening of Space, Art, and Music
2012 – 2015	Presentation on Careers for Women in Science Flandrau Science Center, AZ, and CDCI West High School, ON, Canada
2014	Presentation on Careers in Science for at-risk youth in Tucson
2013	Coordinator for the Starlight Science Cinema with the College of Science at UA
2012 – Present	OSIRIS-REx Mission Ambassador
2012	Volunteer for Science Downtown Student Enrichment Activities
2011	Founder of the Geology Help Center for Undergraduate Tutoring, Queen's University

MEDIA AND PUBLIC ARTICLES

"The Story of the Moon Rock in Joe Biden's Oval Office" Popular Mechanics

URL: <https://www.popularmechanics.com/space/moon-mars/a35280443/joe-biden-has-moon-rocks-in-the-oval-office/>

"Full Steam Ahead Podcast Episode 86 – Asteroid Research", Fox 59 Full Steam Ahead Podcast,

URL: <https://fox59.com/news/full-steam-ahead-podcast-episode-86-asteroid-research/>

“Asteroid explorer collects first samples thought to be rich in organic compounds; a Purdue scientist will be among the first to study”, Purdue University News

URL: <https://www.purdue.edu/newsroom/releases/2020/Q4/asteroid-explorer-collects-first-samples-thought-to-be-rich-in-organic-compounds-a-purdue-scientist-will-be-among-the-first-to-study.html>

“Rocks, Rockets and Robots: The Plan to Bring Mars Down to Earth”
Scientific American

URL: <https://www.scientificamerican.com/article/rocks-rockets-and-robots-the-plan-to-bring-mars-down-to-earth/>

“Dr. Thompson to Investigate Untouched Apollo Samples”
Purdue EAPS

URL: <http://www.eaps.purdue.edu/news/articles/2019/thompson-apollo.html>

“Single moon dust grain collected during Apollo 17 ‘preserves millions of years of history’”
CNN

URL: <https://www.cnn.com/2020/02/07/world/moon-dust-grain-apollo-17-scn/index.html>

“The Lafayette Meteorite and Purdue’s 150th Anniversary Celebration”
The Meteorite Times

URL: <https://www.meteorite-times.com/the-lafayette-meteorite-and-purdues-150th-anniversarycelebration/>

“Chunk of the Lafayette Meteorite from Mars returns to Purdue”
Purdue Giant Leaps Series

URL: <https://takegiantleaps.com/chunk-of-the-lafayette-meteorite-from-mars-returns-to-purdue/>

“Dr. Thompson to Investigate Untouched Apollo Samples”
Purdue EAPS

URL: <http://www.eaps.purdue.edu/news/articles/2019/thompson-apollo.html>

“Spotlight on Dr. Michelle Thompson”

NASA Postdoctoral Program Post Document

URL: https://npp.usra.edu/shared/program/npp/pdfs/newsletters/NPP_Newsletter_2018-04.pdf

“Downlink Event a Stellar Success”

Queen’s University Alumni Review Magazine

URL: <https://www.queensu.ca/gazette/alumnireview/stories/quid-novi-whats-new-and-campus-may-2018>

“Space Dust and Doughnuts”

Queen’s University, March 2018

URL: <http://www.queensu.ca/research/michelle-thompson>

“UA Graduate Sets Sights on the Sky”

Arizona Public Media, February 2017

URL: <https://news.azpm.org/p/news-articles/2017/2/22/106569-ua-graduate-sets-sights-high->

in-the-sky-science-in-space/

"Bewdley native Michelle Thompson in contention to become astronaut"

Northumberland Today, February 2017

URL: <http://www.northumberlandtoday.com/2017/02/21/bewdley-native-michelle-thompson-in-contention-to-become-astronaut>

"Former Northumberland resident Michelle Thompson Canadian Space Agency astronaut candidate"

Northumberland News, February 2017

URL: <http://www.northumberlandnews.com/news-story/7144626-former-northumberland-resident-michelle-thompson-canadian-space-agency-astronaut-candidate/>

"Asteroid, (or sample from one) headed our way"

Arizona Daily Star, June 2016

URL: http://tucson.com/news/science/asteroid-or-a-sample-from-one-headed-our-way/article_60373f56-5229-5456-80af-9c694ac81e47.html

"UA Scientists Bring Fact to Fiction"

Arizona Daily Wildcat, September 2013

URL: <http://www.wildcat.arizona.edu/article/2013/09/ua-scientists-bring-fact-to-fiction>

"Michelle Thompson: Space Dust"

The Complete Engineer, Queen's University, July 2011

URL: <http://engineering.queensu.ca/News-Events/files/TheCompleteEngineer2010Summer.pdf>

"Away from Home"

The Vinyl Café Story Exchange, Canadian Broadcasting Company (CBC)

<https://www.vinylcafe.com/storyarchive/2015/9/24/away-from-home>