

# **Michelle S. Thompson**

## **Curriculum Vitae**

Purdue University  
Department of Earth, Atmospheric, and Planetary Sciences  
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West Lafayette, IN, 47907

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## **EDUCATION**

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

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## **RESEARCH INTERESTS**

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I am interested in understanding the alteration of planetary materials after their formation, specifically how airless surfaces across the solar system evolve. 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, Hayabusa, and Hayabusa2, and OSIRIS-REx missions, and is relevant for the upcoming return of samples from MMX.

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## **EXPERIENCE**

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| 2023 - Present | Associate Professor of Planetary Sciences<br>Department of Earth, Atmospheric, and Planetary Sciences (EAPS)<br>Purdue University |
| 2018 - 2023    | Assistant Professor of Planetary Sciences<br>EAPS<br>Purdue University  |
| 2016 - 2018    | NASA Postdoctoral Fellow<br>Astromaterials Research and Exploration Science<br>NASA Johnson Space Center                          |
| 2011 - 2016    | Graduate Research Assistant/Associate<br>LPL, Department of Planetary Science<br>University of Arizona                            |

## HONORS AND AWARDS

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2023	Seeds for Success Award, Executive Vice President for Research at Purdue University
2022	Purdue College of Science Award for Advancing Diversity
2020	NASA Early Career Fellowship
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	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 Presentation, Rising Stars of Research Conference, UBC

## PEER-REVIEWED JOURNAL ARTICLES

*\*Denotes mentee*

Krüger, H., **Thompson, M. S.**, Kobayashi, M., Mangano, V., Moroni, M., Milillo, A., Keller, L. P., Sasaki, S., Zender, J., Domingue, D., Benkhoff, Galli, A., LeBlanc, F., Murakami, G., Sarantos, M., and Savin, D. W. 2024. Understanding the Dust Environment at Mercury: From Surface to Exosphere. *Planetary Science Journal* 5: 36.

Laczniaik, D. L.,\* **Thompson, M. S.**, Christoffersen, R., Dukes, C. A., Clemett, S. J., Morris, R. V. and Keller, L. P., 2024. Investigating the role of incident ion flux in solar wind space weathering of

carbon-rich asteroidal regolith via H<sup>+</sup> and He<sup>+</sup> irradiation of the Murchison meteorite. *Icarus* 410: 115883.

Huang, T.-J.,\* Ganju, E., Torbatisarraf, H., **Thompson, M. S.**, and Chawla N. 2024. Decoding Moon Dust: Advanced microstructural and compositional analysis of a lunar agglutinate from the Apollo 11 mission. *Meteoritics and Planetary Science* (Accepted).

Matsumoto, T., Noguchi, T., Miyake, A., Igami, Y., Haruta, M., Saito, H., Hata, S., Seto, Y., Miyahara, M., Tomioka, N., Ishii, H.A., Bradley, J.P., Ohtaki, K.K., Dobrică, E., Leroux, H., Guillou, C.L., Jacob, D., de la Peña, F., Laforet, S., Mouloud, B.-E., Marinova, M., Langenhorst, F., Harries, D., Beck, P., Phan, T.H.V., Rebois, R., Abreu, N.M., Gray, J., Zega, T., Zanetta, P.-M., **Thompson, M.S.**, Stroud, R., Burgess, K., Cymes, B.A., Bridges, J.C., Hicks, L., Lee, M.R., Daly, L., Bland, P.A., Smith, W.A., McFadzean, S., Martin, P.-E., Bagot, P.A.J., Fougereuse, D., Saxey, D.W., Reddy, S., Rickard, W.D.A., Zolensky, M.E., Frank, D.R., Martinez, J., Tsuchiyama, A., Yasutake, M., Matsuno, J., Okumura, S., Mitsukawa, I., Uesugi, K., Uesugi, M., Takeuchi, A., Sun, M., Enju, S., Takigawa, A., Michikami, T., Nakamura, T., Matsumoto, M., Nakauchi, Y., Abe, M., Nakazawa, S., Okada, T., Saiki, T., Tanaka, S., Terui, F., Yoshikawa, M., Miyazaki, A., Nakato, A., Nishimura, M., Usui, T., Yada, T., Yurimoto, H., Nagashima, K., Kawasaki, N., Sakamoto, N., Hoppe, P., Okazaki, R., Yabuta, H., Naraoka, H., Sakamoto, K., Tachibana, S., Watanabe, S.-i. and Tsuda, Y. 2024. *Nature Astronomy*: 1-9.

Noguchi, T., Matsumoto, T., Miyake, A., Igami, Y., Haruta, M., Saito, H., Hata, S., Seto, Y., Miyahara, M., Tomioka, N., Ishii, H.A., Bradley, J.P., Ohtaki, K.K., Dobrică, E., Leroux, H., Guillou, C.L., Jacob, D., de la Peña, F., Laforet, S., Mouloud, B.-E., Marinova, M., Langenhorst, F., Harries, D., Beck, P., Phan, T.H.V., Rebois, R., Abreu, N.M., Gray, J., Zega, T., Zanetta, P.-M., **Thompson, M.S.**, Stroud, R., Burgess, K., Cymes, B.A., Bridges, J.C., Hicks, L., Lee, M.R., Daly, L., Bland, P.A., Smith, W.A., McFadzean, S., Martin, P.-E., Bagot, P.A.J., Fougereuse, D., Saxey, D.W., Reddy, S., Rickard, W.D.A., Zolensky, M.E., Frank, D.R., Martinez, J., Tsuchiyama, A., Yasutake, M., Matsuno, J., Okumura, S., Mitsukawa, I., Uesugi, K., Uesugi, M., Takeuchi, A., Sun, M., Enju, S., Takigawa, A., Michikami, T., Nakamura, T., Matsumoto, M., Nakauchi, Y., Abe, M., Nakazawa, S., Okada, T., Saiki, T., Tanaka, S., Terui, F., Yoshikawa, M., Miyazaki, A., Nakato, A., Nishimura, M., Usui, T., Yada, T., Yurimoto, H., Nagashima, K., Kawasaki, N., Sakamoto, N., Hoppe, P., Okazaki, R., Yabuta, H., Naraoka, H., Sakamoto, K., Tachibana, S., Watanabe, S.-i. and Tsuda, Y. 2024. Mineralogy and petrology of fine-grained samples recovered from the asteroid (162173) Ryugu. *Meteoritics and Planetary Science* (accepted).

Leblanc, F., Sarantos, M., Domingue, D., Milillo, A., Savin, D. W., Prem, P., Benkhoff, J., Zender, J., Galli, A., Murakami, G., Sasaki, S., and **Thompson, M. S.** 2024. How does the thermal environment affect the lifetime of volatile and refractory elements on the surface of Mercury? *Planetary Science Journal* 4: 227.

Clark, B.E., Sen, A., Zou, X.D., Dellagiustina, D.N., Sugita, S., Sakatani, N., **Thompson, M. S.**, Trang, D., Tatsumi, E., Barucci, M.A. and Barker, M. 2023. Overview of the search for signs of space weathering on the low-albedo asteroid (101955) Bennu. *Icarus*, p.115563.

- Chaves, L.C.,\* **Thompson, M.S.**, Loeffler, M.J., Dukes, C. A., Szabo, P. S., Horgan, B. H. N. 2023. Evaluating the effects of space weathering on magnetite on airless planetary bodies. *Icarus* 402: 115634.
- Noguchi, T., Matsumoto, T., Miyake, A., Igami, Y., Haruta, M., Saito, H., Hata, S., Seto, Y., Miyahara, M., Tomioka, N., Ishii, H.A., Bradley, J. P., Ohtaki, K., Dobrică, E., Leroux, H., Le Guillou, C., Jacob, D., Marinova, M., de la Peña, F., Langenhorst, F., Harries, D., Beck, P., Phan, T. H. V., Rebois, R., Abreu, N. M., Zega, T. J.,M Zanetta, P.-M., **Thompson, M. S.**, and co-authors. 2023. A dehydrated space-weathered skin cloaking the hydrated interior of Ryugu. *Nature Astronomy* 7: 170-181.
- Dobrică, E., Ishii, H.A., Bradley, J. P., Ohtaki, K., Brearley, A. J., Noguchi, T., Matsumoto, T., Miyake, A., Igami, Y., Haruta, M., Saito, H., Hata, S., Seto, Y., Miyahara, M., Tomioka, N., Leroux, H., Le Guillou, C., Jacob, D., Marinova, M., de la Peña, F., Langenhorst, F., Harries, D., Beck, P., Phan, T. H. V., Rebois, R., Abreu, N. M., Zega, T. J.,M Zanetta, P.-M., **Thompson, M. S.**, and co-authors. 2023. Nonequilibrium spherulitic magnetite in the Ryugu samples. *Geochimica et Cosmochimica Acta* 346: 65-75.
- Clark, B. E., Sen, A., Zou, X.-D., DellaGuistina D. N., Sugita, S., Sakatanni, N., **Thompson, M. S.**, and co-authors. 2023. Overview of the Search for Signs of Space Weathering on Low-Albedo Asteroid (101955) Bennu. *Icarus*: 1155563.
- Jaret, S. J., Rasbury, E. T., Reiners, P., Thompson, L. M., Hemming, S. R., **Thompson, M. S.**, and Spray, J. G. 2023. Extreme isotopic heterogeneity in impact melt rocks with implications for Mars. *Geology* 51: 295-299.
- Chaves, L. C.\* and **Thompson, M. S.** 2022. Space weathering signatures in sulfide and silicate minerals from asteroid Itokawa. *Earth, Planets, and Space* 74: 1 -14.
- Ernst, C. E., Chabot, N. L., Klima, R. L., Kubota, S., Rogers, G., Byrne, P. K., Huack II, S. A., Vander Kaden, 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. Science Goals and Mission Concept for a Landed Investigation of Mercury. *Planetary Science Journal* 3: 68.
- Daly, L., Lee, M. R., Hallis, L. J., Ishii, H. A., Bradley, John P., Bland, P. A., Saxey, D. W., Fougereuse, D., Rickard, W. A., Forman, L. V., Timms, N. E., Jourdan, F., Reddy, S. M., Salge, T., Quadir, Z., Christou, E. V., Cox, M. A., Aguiar, J. A., Hattar, K., Moterrosa, A., Keller, L. P.,M Christoffersen, R., Dukes, C. A., Loeffler, M. J., and **Thompson, M. S.** 2021. Solar contributions to Earth's oceans. *Nature Astronomy* 5(12): 1275-1285.
- Kaplan, H. H., Simon, A. A., Hamilton, V. E., **Thompson, M. S.**, Sandford, S. A., Barucci, M. A., Cloutis, E. A., Brucato, J., Reuter, D. C., Glavin, D. P. and Clark, B. E. 2021. Composition of organics on asteroid (101955) Bennu. *Astronomy & Astrophysics* 653: L1.
- Laczniak, 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* 364: 114479.

Trang, D., **Thompson, M. S.**, and 17 co-authors. 2021. The Role of Hydrated Minerals and Space Weathering Products in the Bluing of Carbonaceous Asteroids. *Planetary Science Journal* 2: 68.

**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.

## PEER-REVIEWED BOOK CHAPTERS

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Schrader, D. L., Davidson, J. McCor, T. J., **Thompson, M. S.**, and Zega, T. J. 2023. Sulfides in Asteroids, Meteorites, and Comets. Chapter in *The Role of Sulfur in Planetary Processes: from Cores to Atmospheres* (in review).

Denevi, B. W., Noble, S.K., **Thompson, M. S.**, 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., and Trang, D. 2023. Space Weathering and Exosphere–Surface Interactions. *New Views of the Moon 2*. Reviews in Mineralogy and Geochemistry Vol. 89.

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*.

## MISSION INVOLVEMENT

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2021 – Present      NASA OSIRIS-REx  
Contact Pad Working Group, Deputy Lead  
Mineralogy and Petrology Working Group Member  
Sample Analysis Data Archiving Working Group Member  
Quick-Look Tiger Team Member

2019 – Present      JAXA Hayabusa2 Mission Science Team  
Fine-Grained Mineralogy and Petrology Working Group

2019 – 2021      Mercury Lander, Science Team Member, Planetary Mission Concept Study  
Member of the Surface/Exosphere Working Group

## INVITED TALKS

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Columbia University, 2024  
Keynote Speaker, Goldschmidt Conference, 2024  
Genesis Mission Workshop Invited Speaker, 2024  
Plenary Speaker, Purdue Northwest Undergraduate Research Days of Discovery, 2024  
Lunar and Planetary Laboratory, University of Arizona, 2023  
Lunar and Planetary Institute, 2023  
University of Nevada Las Vegas, 2022  
American Vacuum Society Conference, Plenary Speaker, 2022  
American Astronomical Society Division of Planetary Sciences Conference, Plenary Speaker, 2022  
University of California Santa Cruz, 2021  
Michigan State University, 2022  
Division of Mineral Sciences, The Smithsonian, 2021  
Birck Nanotechnology Center, Purdue University, 2021  
Northern Arizona University, 2021  
London Museum of Natural History, 2021  
Fordham University, 2021  
Auburn University, 2020  
Arizona State University Center for Meteorite Studies, 2020  
Indiana University – Purdue University Indianapolis, 2020  
Washington University at St. Louis, 2019  
University of Chicago, 2018  
NASA Education Downlink Event for the International Space Station, Queen’s University, 2018

Microscopy and Microanalysis Conference, Hitachi, 2016  
 In-situ Heating in Aberration-Corrected STEM Workshop, Georgia Tech, 2016  
 Microscopy and Microanalysis Conference, 2015  
 Naval Research Laboratory, Washington D.C., 2014  
 Carnegie Institution, Washington D.C., 2014  
 Japanese Aerospace Exploration Agency (JAXA) Hayabusa Symposium, 2013

## MEMBERSHIPS AND SERVICE

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### *At Purdue:*

2023 - 2024	Search Committee for Department Head, EAPS
2023	Faculty Oversight Committee, Electron Microscopy Core Facilities
2022 - 2023	Search Committee for Igneous Petrologist
2021 - 2022	Electron Microscopy Task Force convened by the Purdue Executive Vice President for Research and Partnerships
2020 - Present	College of Science Advancing Diversity Committee
2020 - Present	EAPS Ombudsperson
2020 - Present	EAPS Code of Conduct Committee
2018 - Present	EAPS Diversity Committee Chair
2019 - 2020	Laboratory Safety Committee
2018 - 2020	Faculty Adviser of EAPS Women in Science Program,
2018 - 2020	Graduate Committee
2018 - 2019	Search Committee for Planetary Physics and Planetary Atmospheres

### *In the Community:*

2023 - 2024	Specific Action Team, Artemis Samples Curation and Analysis Team Member
2023 - 2026	Secretary, Extraterrestrial Materials Analysis Group
2023 - 2025	Membership Committee, Meteoritical Society
2022	Co-Chair, Microscopy and Microanalysis Conference
2021 - 2022	Convener, Workshop on Mercury Space Surface Interactions Workshop
2020 - 2022	Antarctic Meteorite Allocation Panel
2020 - 2022	Strategic Planning Committee for the Microscopy and Microanalysis Conference
2020 - 2022	Extraterrestrial Materials Analysis Group, Meteorite Subcommittee Member
2018, 2022	Convener, Instructor of NASA Small Particle Sample Handling Workshop
2021	Science Organizing Committee, Meteoritical Society Conference
2021	Travel Awards Committee, Meteoritical Society Conference
2021	Session Convener, Microscopy and Microanalysis Conference
2021	Session Convener, Goldschmidt Conference
2020	Coordinator for NASA Planetary Science Division Early Career Round Table Discussion with NASA Associate Administrator Dr. Thomas Zurbuchen
2019 - 2022	Director (elected), Microanalysis Society (MAS) of America
2019 - 2020	Curation and Analysis Planning Team for Extraterrestrial Materials (CAPTEM) Meteorite Working Group (MWG) Member (disbanded)
2019	Lunar and Planetary Science Conference (LPSC) Program Committee Lead for Space Weathering, Contributor to Mission and Instrument Concepts
2018 - 2020	Diversity Committee (Chair), 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
2018	Session Convener, Session Chair, Geological Society of America Conference
2018, 2020	Session Convener, Session Chair, Microscopy and Microanalysis Conference
2017	Secretary for the Supporting Women at NASA (SWAN) group
2016 - Present	Panel Chief, Panel Member NASA Review Panels
2015 - Present	Manuscript Reviewer: Icarus, Journal of Geophysical Research – Planets, Nature Astronomy, PNAS, Geochimica et Cosmochimica Acta, Meteoritics and Planetary Science, Nature Communications, Geophysical Research Letters, Earth, Planets and Space
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
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

2023	Green Zone Training <i>Learning to support veterans in their transition back to civilian life and return to college.</i>
2020	Safe Zone and Trans Inclusion Training <i>Trained to be a better ally for the LGBTQ+ community. Coordinated by the Purdue LGBTQ+ Center.</i>
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

2019, 2021, 2022	Instructor for EAPS 243: Earth Materials I (Mineralogy), Purdue University Developed and taught lectures and labs for 40+ undergraduate majors on topics including systematic mineral classification, optical microscopy, etc.
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 15 undergraduate and graduate students on the principles of geochemical and cosmochemical evolution of the solar system.
2020, 2023	Instructor for EAPS 591: Laboratory Analysis of Earth and Planetary Materials, Purdue University Developed and taught lectures for ~20 undergraduate and graduate students on analytical laboratory techniques.
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, 2022	Instructor for the Small Particle Handling Workshop, Lunar and Planetary Institute and Johnson Space Center, Purdue University Instructed participants from around the world on small particle and handling techniques in collaboration with NASA and the Lunar and Planetary Institute.
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 Prepared and taught lab sessions on basic geological engineering concepts, graded coursework.

## MENTORSHIP

### **Current PhD Students:**

2022 - Present	Lisette Melendez Awards: NSF Graduate Research Fellowship Program, NASA Travel Award for the Meteoritical Society Meeting, Henry J. Melosh Award
2020 - Present	Alexander Kling Awards: NASA FINESST fellowship, Meteoritical Society Travel Grant Recipient, Microanalysis Society Goldstein Scholarship
2019 - Present	James McFadden

Awards: Indiana Space Grant Consortium Recipient, Lunar and Planetary Institute Career Development Award, Henry J. Melosh Award, Microscopy and Microanalysis Conference Student Award

**Former Students:**

2018 - 2023      Laura Chaves, PhD  
Awards: NASA FINESST fellowship, Amelia Earhart Scholarship, LPI Career Development Award, Meteoritical Society Travel Awards, Top 100 Most Influential Latinas (Bloomberg)  
Current Position: Postdoctoral Fellow the University of Arizona

2018 - 2023      Dara Laczniak, PhD  
Awards: NASA FINESST fellowship, Amelia Earhart Scholarship, LPI Career Development Award, McKay award from the Meteoritical Society, Wiley Award from the Meteoritical Society, Microscopy Society of America Student Scholar, Goldstein Scholar from the Microanalysis Society, Castaing Award from the Microanalysis Society, Purdue EAP Outstanding Graduate Student, Krockover Award for Contributions to Education and Public Outreach  
Current Position: Faculty, Queen's College New York

**Post-Docs Advised:**

2022 - Present      Dr. Nicolas Bott  
Awards: NASA Travel Grant for the Meteoritical Society Meeting

**Undergraduate Students Advised:**

2024                  Allison King  
2022 - Present      Daniel Garcia  
2022 - 2023          Kasidi Lowry  
2021 - 2013          Victor Mosqueda  
2021 - 2022          Brody Conner  
2020 - 2021          Maizey Benner  
2020                  Amina Patterson  
2019                  Phoebe Kinzelman  
2018 - 2019          Madison McGlaun

**Student Committees:**

2023 - Present      Thanos Kildaras, PhD program  
2021 - Present      Melissa Cashion, PhD program  
2021 - Present      Hunter Vannier, PhD program  
2021 - Present      Moshammat Mijum, PhD program  
2020 - Present      Disha Ohkai, PhD program  
2021 - 2023          Tai-Jan (Ted) Huang, PhD program (Materials Science)  
2019 - 2023          Amanda Rudolph, PhD  
2019 - 2023          Brad Garczynski, PhD  
2019 - 2021          Jennifer Pouplin, PhD program  
2021                  Marie Henderson, PhD  
2018                  Sheridan Ackiss, PhD  
2018                  Kevin Graves, PhD

## CURRENT SUPPORT

Total: \$3,769,457

### **NASA Solar System Workings Program, 2023**

Title: *An Experimental Investigation of Space Weathering Processes on the Surface of Mercury*

PI: Michelle Thompson

Value: \$1,317,913

### **NASA Solar System Workings Program, 2023**

Title: *Analysis of mineralogical and geochemical changes to geologic samples after 60 days of weathering at Venus surface conditions in the NASA Glenn Extreme Environments Rig (GEER)*

PI: Martha Gilmore

Role: Co-I

Value: \$255,062

### **NASA Support for Planetary Sample Science Program, 2023**

Title: *Expanding NASA's Community for Planetary Sample Science (ENCommPSS)*

PI: Lisa Gaddis

Role: Co-I

Value: \$20,444

### **NASA Solar System Exploration and Research Virtual Institute (SSERVI), 2023**

Title: *Research Activities Supporting Science and Lunar Exploration (RASSLE)*

PI: Dana Hurley

Role: Co-I

Value: \$519,317

### **NASA Future Investigators in NASA Earth, Space Science, and Technology, 2023**

Title: *Determining the origin and behavior of water in space weathered rims of lunar soils*

PI: Michelle Thompson

Future Investigator: Alexander Kling

Value: \$135,000

### **NASA Laboratory Analysis of Returned Samples Program, 2022**

Title: *Carbon Tracers of Geologic Activity in Samples from Asteroid Bennu: Origins and Relationship of Carbonate and Organic Phases*

PI: Kelly Miller

Role: Co-I

Value: \$71,783

### **NASA Solar System Workings Program, 2022**

Title: *Space Weathering of Carbonaceous Asteroid Analogs: Separating Laboratory Curiosities from Systematic Trends*

PI: Mark Loeffler

Role: Co-I

Value: \$174,054

### **Participation in NASA OSIRIS-REx Mission, 2021**

PI: Dante Lauretta

Role: Co-I

Value: \$210,488

**NASA Laboratory Analysis of Returned Samples Planetary Major Equipment Program, 2021**

Title: *Development of a Next-Generation Scanning-Transmission Electron Microscope and Associated Techniques: Preparing for the Coordinated Analysis of OSIRIS-REx, Hayabusa2, and MMX Samples*

PI: Lindsay Keller

Role: Co-I

**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 Solar System Workings Program, 2019**

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

PI: Michelle Thompson

Value: \$599,015

**FORMER SUPPORT**

*Total: \$1,718,432*

**Purdue Instructional Equipment Grant Program, 2023**

Title: *Maintaining a Robust Undergraduate Curriculum in EAPS through Foundational Instruction*

PI: Michelle Thompson

Value: \$36,451

**NASA Future Investigators in NASA Earth, Space Science, and Technology, 2021**

Title: *Investigating space weathering of carbon-rich asteroidal regolith through experimental simulations and returned sample analysis*

PI: Michelle Thompson

Future Investigator: Dara Laczniak

Value: \$135,000

**NASA Early Career Fellowship, 2020**

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

PI: Michelle Thompson

Value: \$99,917

**NASA Future Investigators in NASA Earth, Space Science, and Technology, 2020**

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

PI: Michelle Thompson

Future Investigator: Laura Chaves

Value: \$135,000

**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

Role: Collaborator

Value: \$1,436

**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

Role: Co-I

Value: \$190,148

**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

**SELECTED SAMPLE PROPOSALS**

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**Lunar Sample Proposal, NASA**

*Understanding the Geologic History of the Taurus-Littrow Valley*

PI: Michelle Thompson, 2 lunar soils awarded

**Hayabusa2 Sample Proposal, 2021, 2024 Japanese Aerospace Exploration Agency (JAXA)**

*Understanding Space Weathering of Samples from Asteroid Ryugu*

PI: Michelle Thompson, 5 particles awarded

**Lunar Sample Proposal, 2021, 2023 NASA**

*Quantifying Water in Space Weathered Lunar Soils*

PI: Michelle Thompson, 6 lunar soils awarded

**Hayabusa Sample Proposal, Japanese Aerospace Exploration Agency (JAXA)**

*Understanding the Microstructural and Chemical Signatures of Space Weathering in Sulfide Minerals*

PI: Michelle Thompson, 5 particles awarded

## PUBLIC OUTREACH

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2019 - 2023	Volunteer Speaker on Topics in Space Exploration for 5000 high school students at Cobourg Collegiate Institute
2022	Coordinator for 8-week Public Outreach Program serving 100 kids weekly, Boys and Girls Club of Lafayette
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: Geology Help Center for Undergrad Tutoring, Queen's University

## MEDIA AND PUBLIC ARTICLES

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*CBC The National Profile:*

URL: <https://www.cbc.ca/player/play/2273717315996>

*OSIRIS-REx Media:*

*BBC News Network (TV), Nature (print), PBS Newshour (print), WBAA NPR (radio), New Scientist (print), Scientific American (print), Inside Indiana Business (print) AP News (video)*

*"NASA Mission that could Save Humanity" ABC News*

URL: <https://abcnews.go.com/US/video/nasa-mission-save-humanity-90348356>

*"Analysis of Returned Samples from Asteroid Itokawa Shows that Sulfides and Silicates Respond Differently to Space Weathering" Lunar and Planetary Institute, Planetary News*

URL: [https://www.lpi.usra.edu/planetary\\_news/2022/09/06/analysis-of-returned-samples-from-asteroid-itokawa-shows-that-sulfides-and-silicates-respond-differently-to-space-weathering/?utm\\_source=Lunar+and+Planetary+Institute+Newsletters&utm\\_campaign=7feb3a9a2c-EMAIL\\_CAMPAIGN\\_2022\\_03\\_02\\_COPY\\_01&utm\\_medium=email&utm\\_term=0\\_351c2a9ed0-7feb3a9a2c-99052897](https://www.lpi.usra.edu/planetary_news/2022/09/06/analysis-of-returned-samples-from-asteroid-itokawa-shows-that-sulfides-and-silicates-respond-differently-to-space-weathering/?utm_source=Lunar+and+Planetary+Institute+Newsletters&utm_campaign=7feb3a9a2c-EMAIL_CAMPAIGN_2022_03_02_COPY_01&utm_medium=email&utm_term=0_351c2a9ed0-7feb3a9a2c-99052897)

*"Still taking giant leaps from lunar small steps: Purdue scientists analyze moon dust collected by Apollo 17 astronauts" Purdue University News*

URL: <https://stories.purdue.edu/still-taking-giant-leaps-from-lunar-small-steps-purdue-scientists-analyze-moon-dust-collected-by-apollo-17-astronauts/>

*"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>

*"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](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](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>