

Debarati Das

Postdoctoral Fellow
Center for Terrestrial and Planetary Exploration
University of Winnipeg

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Career:

University of Winnipeg (2025-current)

- Postdoctoral Research Associate (2025-present)

Los Alamos National Laboratory (2022-2025)

- Postdoctoral Research Associate (2024-2025)
- Chick Keller Fellowship (2022-2024)
- Science Payload Uplink Lead trainee for NASA Curiosity rover's ChemCam instrument (2023-24)
- NASA proposal review panellist (2023, 2025)
- National Geographic Science Textbook coauthor (in preparation)

McGill University, Montreal, Canada (2017-2022)

- **PhD** in Planetary Geochemistry (Department of Earth & Planetary Sciences)
- Graduate academic advisors: Dr. Kim Berlo, co-advisor: Dr. Richard Leveille
- **GPA: 4.0**
- NASA's Mars Science Laboratory Science team member since May 2018-2024
- NASA proposal review panellist

Institute for Planetary Materials, Okayama University, Japan (2014-2017)

- 3-year **master's program** in Planetary Geochemistry (Pheasant Memorial Laboratory)
- Academic advisor: Takuya Kunihiro
- Grade: **A+ (GPA: 4.0)**

Indian Institute of Technology, Mumbai, India (2012-2014)

- 2-year **master's program** in Applied Geology (Department of Earth Science)
- Academic advisor: Bobby Mathews
- Cumulative performance index: **9.02/10 (GPA: 4.0)**

St. Xavier's College, Mumbai, India (2008-2011)

- 3-year **bachelor's program** in Applied Geology (Department of Geology)
- Percentage: **85.87% (GPA: 4.0)**

Research Grants and Fellowships:

- ISR Early Career Pitch Day Grant- Modelling sustainable Li resources (2024-2025, Los Alamos National Laboratory)
- Chick Keller Postdoctoral Fellowship- Technology transfer from space to terrestrial applications (2022, Los Alamos National Laboratory)
<https://www.linkedin.com/pulse/from-earth-mars-back-again-los-alamos-national-laboratory>
- National Geographic Early Career Grant (2018, National Geographic Grant):
<https://explorers.nationalgeographic.org/directory/debarati-das>

Scholarships:

- Graduate Research Enhancement and Travel award (for conference attendance, 2022, McGill University, Canada)
- Graduate Research Enhancement and Travel award (for conference attendance, 2021, McGill University, Canada)
- J.B Lynch award (\$15000, 2020, McGill University)
- Eric Mountjoy Fellowship (\$8000, 2019, McGill University)
- LeRoy Memorial Fellowship (\$3000, 2018, McGill University)
- Astrobiology Grand Tour Student Scholarship (2018, University of New South Wales, Australia)

Academic Awards:

- Departmental symposium poster award (2019, McGill University)
- Departmental symposium poster award (2018, McGill University)
- Canadian Space Summit Student Challenge Award (2018, Students for the Exploration and Development of Space: SEDS, Canada) video link:
<https://www.youtube.com/watch?v=sm6szUoq5Ss>
- Merit based Differential Fee Waiver (2018, McGill University)
- Salehbbhai Kaderbbhai Khalil Endowment Prize for highest score (2011, Mumbai University, India)
- Late Noshirwan H. Sethna Geology Scholarship (2011, St. Xavier's college, India)

Outreach, Leadership, and Professional Experiences:

Community engagement:

- ISR-6 Internal Seminar Series co-organizer (2023-current)
- NASA panel reviewer (February 2024)
- American Geophysical Union conference session co-chair (Martian Aqueous Processes Inferred from Observations, Analogues, and Experiments- December 2023)
- NASA panel executive secretary (Dec 2020)
- Journal reviewer for:
 - Nature Geosciences
 - Journal of Geophysical Research: Planets
 - Geochimica et Cosmochimica Acta
 - Meteoritics and Planetary Science
- National Geographic Explorer blogger (Apr 2019 – December 2022)
- Artwork sent to space on a Planet satellite for the largest exhibition in space (<https://www.cbc.ca/player/play/1993061955789>)
- National Geographic Education speaker (Oct 2023, <https://www.youtube.com/watch?v=QaePjdeWl0c>)
- National Geographic Education speaker (Nov 2021, <https://www.youtube.com/watch?v=4OmHqrBxpz8&t=1971s>)
- National Geographic Education speaker (Oct 2019, <https://www.youtube.com/watch?v=0U4gn6GIQc&t=589s>)
- Bunsen and Beaker podcast chat about geochemistry on Mars: <https://bunsenbernerbmd.buzzsprout.com/413041/13220859-season-5-episode-22-from-ocean-hues-to-mars-views-with-dr-debarati-das>)
- Science based art illustrations for Montreal's Astronomy workshop platform Plateau Astro (January 2021, <https://plateuastro.com/shop/future-skies-montreal-2021> and https://mailchi.mp/819d9eec7486/the-day-we-land-on-mars-future-skies?fbclid=IwAR2tPtJrbuumMe6aSlj_GTheQIKK0BxY2l47l_DP01Uz-2fY1KpaXw-G7_M)
- WeMartians Podcast- Perseverance landing day discussion (February 2021 <https://www.youtube.com/watch?v=6GIWMIPTguQ&t=2s>)
- Off Nominal podcast- Interview with Jaime Green; author of "The Possibility of Life" <https://offnom.com/episodes/107>)
- Science educator volunteer for Let's Talk Science (June 2018-current, https://www.youtube.com/watch?v=Bnrg5wNEa6Q&list=PLSHdRdev5PmzB_5H8GHAA11ZjnWoX0rW)
- University of Southampton invited talk (Title: Chasing water on Mars with Lasers, July, 2020)
- Speaker for Pint of Science (May 2019, 2020, Montreal)
- Diaries of Space Explorers, chat about importance of creativity in Science (June 2021, <https://diariesofspace.podbean.com/e/the-diaries-of-space-explorers-episode-20-fostering-creativity-in-a-kinder-academic-community/>)
- Speaker for Broad Science Podcast (May 2019, McGill University <https://soundcloud.com/broad-science/exploring-life-on-mars-extended-interview-with-debarati-das>)

- Space science themed art illustration based small business promoting inclusivity and enthusiasm for space science (https://www.etsy.com/shop/EnterStellarCo?ref=simple-shop-header-name&listing_id=1121152084)

Leadership:

- Equity, Diversity, and Inclusivity student representative (2020-2022, Earth and Planetary Sciences, McGill University)
- Department Sustainability Committee student representative (2020-2022, Earth and Planetary Science, McGill University)
- Departmental Science Outreach student representative (2019-2020, EPS McGill University)
- Departmental Student Body Vice President (2018–2019, EPS, McGill University)
- Education and outreach leader for McGill Space Group (2018–2019, McGill University)

Professional experiences:

- Teaching assistant (2017- 2021, McGill University, Montreal, Canada)
- Research assistant (2014-2017, Institute for Planetary Materials, Okayama, Japan)
- Assistant professor (January- April 2014, St. Xavier's College, Mumbai, India)
- Summer intern: Misasa International Student Internship Program (July-August 2013, Institute for Planetary Materials, Misasa, Japan)
- Summer intern: Petroleum Exploration and Production (May 2012, Reliance Industries Limited, Mumbai, India)

Peer reviewed Publications:

- First authored: **Simulating evaporative wet and dry cycles in Gale crater, Mars using thermochemical modelling techniques.** Author list: D. Das, S.M.R. Turner, S.P Schwenzer, P. J. Gasda, J. Palandri, K. Berlo, R. J. Leveille, L. Crossey, B. M. Tutolo, N. L. Lanza. (2025), *Meteoritics & Planetary Science*.
- First authored: Title: **Boron and Lithium in Calcium Sulfate Veins: Tracking Precipitation of Diagenetic Materials in Vera Rubin Ridge, Gale Crater.** Author list: Das, D., Gasda, P. J., Wiens, R. C., Leveille, R. J., Berlo, K., Frydenvang, J., Mangold, N., Kronyak, R. E., Schwenzer, S. P., Forni, O., Cousin, A., (2020) *Journal of Geophysical Research: Planets*, Volume: 125, 8. Total number of citations on Google Scholar: 9
- In preparation: **Estimating past fluid pH and evaporative conditions in Gale crater using terrestrial analog evaporites and phyllosilicates.** Author list: D. Das, P. J. Gasda, K. Berlo, R. J. Leveille, M. A. Nellesen, L. Crossey, E. Peterson, R. Beal, A. L. Reyes-Newell, S. M. Clegg, A. M. Ollila, N. L. Lanza.
- In preparation: **VISIR Reflectance studies of Planetary analog materials using Spectrogoniometer technique.** Author list: D. Das, R. Martinez, C. Legett, E. Sklute, S.M. Clegg, A. Ziemann, Wolf. U.
- In preparation: **Refining Subsurface Characterization of InSAR-observed Deformation via Lithologically-Informed Priors.** Author list: D. Das, E. Reinisch
- Co-authored (submitted-July 2024): **Elevated-Mn ChemCam Targets Illuminating Mn Redox Cycling and Diagenesis in the Bradbury Rise, Gale Crater, Mars.** Author list: J. M. Comellas, A. Essunfeld, R. Morris, N. Lanza, P. J. Gasda, D. Das, D. Delapp, R. C. Wiens, O. Gasnault, S. Clegg, C. C. Bedford, E. Dehouck, B. C. Clark, R. Anderson, W. Fisher, V. Lueth.
- Co-authored (submitted-June 2024): **Amapari Marker Band Metal-Enrichments: Potential Mechanisms and Implications for Surface and Subsurface Water and Weathering in Gale**

crater. Author list: PJ Gasda, J Comellas, A Essunfeld, D Das, M Nellessen, E Dehouck, R Anderson, W Rapin, N Lanza, P-Y Meslin, G David, L Crossey, H Newsom, M Hoffman, D Fey, R Kronyak, J Frydenvang, J Bridges, SMR Turner, SP Schwenzer, RC Wiens, S Clegg, S Maurice, O Gasnault

- Co-authored (in preparation): **Formation of Warm-Temperature Salts in Gale Crater, Mars.** Author list: E. B. Hughes, F. Rivera-Hernández, J. Wray, W. Rapin, J. Johnson, K. Rammelkamp, Olivier Forni, P. Gasda, B. Tutolo, A. Eng, E. Sklute, D. Das, A. Roberts, R. Y. Sheppard, E. Dehouck, O. Gasnault, N. Lanza.
- Co-authored: **Boron adsorption in clay minerals: Implications for martian groundwater chemistry and boron on Mars.** Author list: Nellessen, M. A., Gasda, P. J., Crossey L., Peterson E., Abdulmehdi A., Zhang J., Zhou W., Das, D., Delapp, D., Clegg, S., Wiens, R. *Icarus* 401 (2023): 115599. Total number of citations on Google Scholar: 2
- Co-authored: **Askival: An altered feldspathic cumulate sample in Gale crater.** Author list: Bowden, D.L., Bridges, J.C., Cousin, A., Rapin, W., Semprich, J., Gasnault, O., Forni, O., Gasda, P., Das, D., Payré, V. and Sautter, V., 2023. *Meteoritics & Planetary Science*, 58(1), pp.41-62. Total number of citations on Google Scholar: 1
- Co-authored: **Overview of the Morphology and Chemistry of Diagenesis in the Clay-Rich Unit of Gale Crater, Mars.** Author list: Gasda, P. J., Comellas, J., Essunfeld, A., Das D., Bryk, A. B., Schwenzer, S. P., Crossey, L., Herkenhoff, K., Johnson, J. R., Newsom, H., Lanza, N. L., Rapin, W., Goetz, W., Meslin, P-Y., Bridges, J. C., Anderson, R., David, G., Turner, S. M. R., Thorpe, M. T., Kah, L., Frydenvang, J., Kronyak, R., Caravaca, G., Ollila, A., Le Mouelic, S., Nellessen, M., Hoffman, M., Fey, D., Cousin, A., Wiens, R. C., Clegg, S. M., Maurice, S., Gasnault, O., Delapp, D., Reyes-Newell, A., (2022), *Journal of Geophysical Research: Planets*. Accepted on April 8, 2022. Total number of citations on Google Scholar: 19
- Co-authored: **Biosignature detection by Mars rover equivalent instruments in samples from the CanMars Mars Sample Return Analogue Deployment.** Author list: Stromberg, J. M., Parkinson, A., Morison, M., Cloutis, E., Casson, N., Applin, D., Poitras J., Moreas Marti A., Maggiori C., Cousins C., Whyte L., Kruzelecky R., Das D., Leveille, R., Berlo, K., Sharma S. K., Acosta-Maeda, T., Daly, M., Lalla, E., (2019). *Planetary and Space Science*, Volume: 176. Total number of citations on Google Scholar: 23
- Co-authored: **Titanite mineralization of Microbial Bioalteration textures in Jurassic Volcanic Glass, Coast Range Ophiolite, California.** Author list: Izawa, M., Banerjee, N. R., Shervais, J. W., Flemming, R. L., Hetherington, C. J., Muehlenbachs, K., Schultz C., Das D., Barry B. H., (2019). *Frontiers in Earth Science*, Volume: 7, 315. Total number of citations on Google Scholar: 6

Invited talks and poster presentations:

- Invited Talk: Los Alamos High school. Title "**From Mars to Earth and Onward to Other Planetary Bodies**". April 10, 2025.
- Invited Talk: McGill University, Department of Earth and Planetary Science. Title "**A search for life: From Mars to Earth and Onward to Other Planetary Bodies**". February 21, 2025.
- Invited Talk: University of California, Davis, Mechanical and Aerospace Engineering department. Title "**A journey through Mars and Earth and all the art it inspired**" February 14, 2025.

- Invited Talk: University of New Mexico, Earth and Planetary Science department. Title “**From Mars to Earth and Onward to Other Planetary Bodies**”. February 10, 2025.
- Poster: D. Das, R. Martinez, C. Legett, S. Clegg, A. Ziemann, E. Sklute, U. Wolf, W. Li, K. Williams. (2025, March). **Building and Characterizing a VISIR Reflectance Library and Spectral Database at Los Alamos National Labor.** *Lunar and Planetary Science Conference, 2025*
- Poster: E. Reinisch, D. Das. **Refining Subsurface Characterization of InSAR-observed Deformation via Lithologically-Informed Priors.** *Conference on Data Analysis, 2025.*
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- **Poster:** D. Das, R. Martinez, C. Legett, S. Clegg, A. Ziemann, E. Sklute. (2024, December). **VISIR reflectance studies of planetary analog materials using spectro-goniometer techniques.** *American Geophysical Union Conference, 2024.*
- **Poster:** D Das, VV Vesselinov, T Kliphuis, E Peterson, L Crossey, MA Nellessen, PJ Gasda, E Sklute, S Clegg, N Lanza (2024, March). **Characterizing Boron and Lithium Partitioning in Martian Analog Materials Using Comprehensive Geo-Chemical Analysis, Principal Component Analysis, and Machine Learning.** *Lunar and Planetary Science Conference (Vol. 55).*
- **Poster:** D. Das, P. J. Gasda, S. P. Schwenzer, S. M. Turner, B. M. Tutolo, A. M. Ollila, A. C. Strzelecki, N. L. Lanza. (2023, December). **Expanding the thermochemical parameter database for improved Martian and terrestrial geochemical models.** *American Geophysical Union Conference, 2023.*
- **Talk:** Das D., S.M.R. Turner, S.P Schwenzer, P. J. Gasda, J. Palandri, K. Berlo, R. J. Leveille, L. Crossey, B. M. Tutolo, N. L. Lanza. (2023, March). **Estimating Past Fluid pH and Evaporative Conditions in Gale Crater, Using Terrestrial Analog Evaporites and Clays.** *Lunar and Planetary Science Conference (Vol. 54).*
- **Poster:** Das, D., Gasda, P. J., Leveille, R. J., Berlo, K., Nellessen M. A., Crossey L., Peterson E., Beal R., Reyes-Newell A. L., Clegg S. M., Ollila A. M., Lanza N. L., (2022, March). **Evaporite Veins of Southern California: Searching for the Origins of Boron and Lithium in Calcium Sulfate Veins of Gale Crater.** *Lunar and Planetary Science Conference (Vol. 53).*
- **Poster:** Das, D., Gasda, P. J., Schwenzer, S. P., Crossey, L., Turner, S. M. R., Leveille, R. J., Berlo, K., Frydenvang J. (2022, March). **Understanding the Formation Stages of Evaporites in Gale Crater Using Thermochemical Modeling.** *Lunar and Planetary Science Conference (Vol. 53).*
- **Talk:** Das, D., Gasda, P. J., Schwenzer, S. P., Crossey, L., Turner, S. M. R., Leveille, R. J., Berlo, K., Wiens, R. C., (2021, March). **Modelling the Behaviour of Selected Water-Soluble Elements in Calcium Sulfate Veins of Gale Crater.** *Lunar and Planetary Science Conference (Vol. 52).*
- **Poster:** Das, D., Gasda, P. J., Wiens, R. C., Leveille, R. J., Berlo, K., Kronyak, R., (2020). **Evaporites in Southern California: Preliminary Results from Analogs of Boron-Rich Calcium Sulfate Veins in Gale Crater, Mars.** *Lunar and Planetary Science Conference (Vol. 51).*
- **Poster:** Das, D., Gasda, P. J., Wiens, R. C., Leveille, R. J., & Berlo, K. (2020, October) **Fluid-Clay-Evaporite Interaction: An Analog for Evaporite Geochemistry in Gale Crater.** Clay Mineral Society Annual conference, 2020.

- **Poster:** Das, D., Gasda, P. J., Wiens, R. C., Leveille, R. J., & Berlo, K. (2019, March). **Measurement of Boron in Gale Crater Near Vera Rubin Ridge.** *Lunar and Planetary Science Conference* (Vol. 50) at Houston, TX.

Skills (5-proficient, 1-novice):

- Technical: CHIM-XPT (4), Matlab (3), Python (3), R (2), Adobe Illustrator (4), Adobe Photoshop (5), Microsoft suite- e.g. Excel, Word etc. (5)
- Languages: English (5), Hindi (5), Bengali (5), Marathi (3), Japanese (2), French (1).
- General: Scientific and creative writing (5), Science outreach, engagement, and communication (5), project management (4), International collaboration (5)