

SUNITI KARUNATILLAKE (WALIMUNI DEVAGE) 2 PAGE RESUME

Geology & Geophysics, Louisiana State University (LSU), Baton Rouge, LA; 225 366 7029 sunitiw@lsu.edu

Planetary Science Lab [Website](#) ResearcherID: [A-5934-2009](#) ORCID ID: [0000-0001-9891-1432](#)

Expertise in planetary critical zones, specialized in the synthesis of satellite and in situ data for statistical analyses, photoanalysis, soil sedimentology, regolith hydration, halogen cycle, and igneous processes. Interpreting chemical maps derived from the 2001 Mars Odyssey Gamma Ray and neutron spectrometer Suite (GRS). Mars mission concept development (2021 [a](#), [b](#), [c](#)), Mars Mission payload development [e.g., [2016](#)] and planetary pedology [e.g., [2020](#)]. Invited researcher in residence and speaker at IRAP-Toulouse, France (2018); co-convener of conference sessions (e.g., AGU2021 [Aquaplanetology](#): Aqueous Environments and Habitability in the Solar System AGU-2021; Exploring Hydrothermal Processes and Geochemistry Across the Solar System's Geologic Evolution and Habitability Session [P54](#)).

A. Professional Preparation

<u>College/University</u>	<u>Major</u>	<u>Degree & Year</u>
Wabash College, IN Advisor: Dr. Dennis Krause	Physics	BA Summa Cum Laude, 2001
Cornell University, NY Advisor: Dr. Steve Squyres	Physics/Astronomy and Planetary Science	PhD, 2008
Stony Brook University, NY Advisor: Dr. Scott McLennan	Planetary/Geoscience (postdoctoral)	2008 - 2011

B. Academic/Professional Appointments in reverse chronology

2019-present: Associate Professor, Geology & Geophysics, LSU, Baton Rouge, LA
2013-2018: Assistant Professor, Geology & Geophysics, LSU, Baton Rouge, LA
2011-2012: Assistant Professor, Chemistry, Biochemistry, and Physics, Rider University, NJ
2008 – 2011: Postdoctoral Researcher in planetary science, Stony Brook University, NY

C. Example Publications in expertise areas (of 51 total, [Google Scholar](#))

~:Bsc; `:MSc; +:PhD; ^:postdoctoral mentees (current or former)

Life and prebiotic organics:

+Williams, A. J., Sumner, D. Y., Alpers, C. N., **Karunatillake, S.**, & Hofmann, B. A. (2015). Preserved Filamentous Microbial Biosignatures in the Brick Flat Gossan, Iron Mountain, California. *Astrobiology*, 15(8), 637–667. [DOI: 10.1089/ast.2014.1235](https://doi.org/10.1089/ast.2014.1235)

Habitability & water:

+Hood, D. R., **Karunatillake, S.**, Gasnault, O., Williams, A. J., Dutrow, B. L., +Ojha, L., Kobs, S., Kim, K., Heldmann, J., et al. (2019). Contrasting Regional Soil Alteration across the Topographic Dichotomy of Mars. *Geophysical Research Letters*, 1–10. [DOI: 10.1029/2019GL084483](https://doi.org/10.1029/2019GL084483)

+Ojha, Lujendra Ojha, J. J. Wray, S. L. Murchie, A. S. McEwen, M. J. Wolff, and **S. Karunatillake** (2013), Spectral Constraints on the Formation Mechanism of Recurring Slope Lineae, *Geophys. Res. Lett.*, 40, GL057893, doi: [10.1002/2013GL057893](https://doi.org/10.1002/2013GL057893)

Evolution of surface /geological evolution:

`Frizzell, K., Ojha, L., **Karunatillake, S.** (2023). Bounding the unknowns of martian crustal heat flow from a synthesis of regional geochemistry and InSight mission data. *Icarus*, 405, [DOI: 10.1016/j.icarus.2023.115700](https://doi.org/10.1016/j.icarus.2023.115700)

Interior evolution and volcanism:

`Susko, D., **Karunatillake, S.**, `Kodikara, G., ^Skok, J. R., Wray, J., Heldmann, J., ... ~Judice, T. (2017). A record of igneous evolution in Elysium, a major martian volcanic province. *Scientific Reports*, 7, 43177. [DOI: 10.1038/srep43177](https://doi.org/10.1038/srep43177)

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Ojha, L., **Karunatillake, S.**, Karimi, S. et al. (2021) Amagmatic hydrothermal systems on Mars from radiogenic heat. Nat Communications. 12, 1754. [DOI: 10.1038/s41467-021-21762-8](https://doi.org/10.1038/s41467-021-21762-8)

Select Synergistic Activities

Professional leadership: Steering committee member (2018 - 2023), Africa Initiative for Space and Planetary Science ([AFIPS](#)); Steering lead, [LSU-2025 College of Science](#) Planetary Initiative to Explore Mars and Beyond; Scientific Society for Astrobiology Board of Directors ([SSA](#))

Teaching and advising: (a) courses on introductory physical geology at LSU (GEOL1001, 150 – 300 enrollment); (b) graduate courses on planetary remote sensing (GEOL4002; GEOL7972; GEOL 7900); (c) chair dissertation and thesis committees for BSc, MSc, and PhD candidates; (d) currently mentoring 9 PhD students on planetary projects at LSU, Georgia Tech, Rutgers, Physical Research Laboratory (India), and China University of Geoscience, Wuhan; (e) currently mentoring 2 postdoctoral scholars at NASA-MSFC (Dr. Alka Rani) and ARC (Dr. Devan Nisson).

Professional service: reviewer for Analytical and Bioanalytical Chemistry, Icarus, J. Geophys. Res., Nature, etc.; NASA review panelist for mission payloads, data analysis, participating scientist, etc.

Invited textbook authorship: (a) Boynton, W. V., Taylor, G. J., **Karunatillake, S.**, Reedy, R. C., and Keller, J. M. (2008), Elemental abundances determined via the Mars Odyssey GRS, in The Martian Surface: Composition, Mineralogy and Physical Properties, Jim Bell Ed., Cambridge University Press; (b) **Karunatillake, S.**, Carter, L. M., Franz, H. B., Hallis, L. J., Hurowitz J. A. (2019), Geochemical interpretations using multiple remote datasets, in Remote Compositional Analysis, Bishop, J.L., Bell III, J. F., and Moersch J. E. Eds., Cambridge University Press DOI 10.1017/9781316888872.

Grants since 2013: Over 10 MDAP, PSTAR, EPSCoR grants (e.g., “Clarifying regional scale regolith hydration processes on Mars” “Seeking Signs of Life in an Ancient Martian Hot Spring”) totaling > \$1.8M. Few select examples follow.

Year (fund in thousands \$)	Grants *BSc; **MSc; ***PhD; ^Postdoctoral mentee
08/2024 – 08/2025 (167, renewable)	CoPI on US Department of Interior-USGS “Control of invasive species using genomic insights”
06/2023-06/2025 (250)	PI on “The GANGOTRI mission for geologic, habitability, and resource insight of Mars,” Louisiana State University’s Provost’s Fund for Innovation in Research – Phase 3, one of the two largest seed funds for faculty research in LSU’s history
10/2022-9/2023 (149)	CoI on NSF FW-HTF-P: Fostering Transferable Skills for Future-Ready Extraterrestrial Construction Workforce via an Intelligent-Immersive Training Environment
9/2019 – 7/2020 (16)	PI on NASA-LaSPACE Graduate Research Assistantship (GSRA), funding Connor Matherne** on ““Identifying Shock Characteristics within the Brushy Creek Feature”
08/2021-08/2023 (290)	Mentoring collaborator on NASA- Mars Data Analysis Program grant on “Investigating Boulder Pattern Formation and Causes in the Martian Northern Lowlands” funding Donald Hood*** on his postdoc
7/2018 – 7/2022 (309)	PI for NASA: Mars Data Analysis Program (MDAP) grant on “Clarifying regional scale regolith hydration processes on Mars”
1/2018 – 5/2019 (67)	PI for NASA’s Established Program to Stimulate Competitive Research (EPSCoR) via Louisiana’s Board of Regents (BoR) and Louisiana Space Grant (LaSPACE) Research Award Program (RAP) on “Applying photoanalyses for soil sedimentology at Gale Crater, Mars”