Nina Lanza Updated February 2026

SUMMARY: SCIENTIST, EXPLORER, COMMUNICATOR

Planetary scientist with 12 years of professional experience leading and enabling high-impact research in geology, geochemistry, astrobiology, and space exploration. Proven ability to build and maintain collaborations with international partners, federal agencies, and academia. Passionate about communicating the importance of exploration for society to decision-makers, technical communities, and the public.

PROFESSIONAL SKILLS

Scientific & Technical Expertise	Geochemistry (manganese, redox, rock coatings) | Astrobiology | Field studies | Mission operations | Human spaceflight | Instrument & conops development | Analytical techniques (LIBS, SEM, EPMA) | Active peer reviewer
Leadership & Management	Project management | Program development | Team management | Collaborative partnerships | Proposal writing | Mentorship | Review panel service (chair)
Communication	Factual and scripted television | Public outreach and education | Technical presentations | Social media | Invited speaker

RESEARCH HIGHLIGHTS

- Led discovery and interpretation of high manganese materials on Mars with ChemCam observations, leading to two high-impact first-author journal articles and six co-authored journal articles.
- Developed new methods for using LIBS acoustic data to identify and interpret rock coatings; led design and setup of new laboratory experimental acoustic chamber capability at Los Alamos.
- Developed and co-led new Planning/Strategic Shift for JETT5 (Joint EVA and Human Surface Mobility Test Team 5) to simulate Artemis III extravehicular activities (EVAs).

IMPACT

84 peer-reviewed publications | 12,967 citations | h-index 53 | Active DOE-Q clearance | Explorers Club Fellow

RESEARCH EXPERIENCE

Principal Investigator, ChemCam instrument **2021 – present**

NASA Mars Science Laboratory (Curiosity) rover mission

- Leading international team of 70+ scientists and engineers at 20 institutions worldwide to operate, maintain, and analyze data from the ChemCam instrument onboard the NASA Mars Science Laboratory (MSL) rover; responsible for an annual budget of ~$2M.
- Working with MSL project leadership to accomplish mission strategic science goals and supporting discovery science.
- Oversaw the recovery of ChemCam laser operations after failure of high voltage power supply in 2021, for which the engineering team was awarded the Explorers Club Citation of Merit (2022).

Staff Scientist (Scientist IV) **2014 – present**

Los Alamos National Laboratory, Los Alamos, NM

- Moon to Mars Team Lead (ISR-1) for 6 staff, postdocs, and students; responsible for providing annual staff written performance evaluations, updating Group Management on Team progress toward goals.
- Space and Planetary Exploration Team Lead (ISR-6) for 5-10 staff, postdocs, and students.
- Acting Deputy Group Leader for Space Remote Sensing & Data Science (ISR-6) supporting ~40 staff.
- Secured funding and oversaw execution for multiple research projects with annual budgets of $30-800k and 5-10 staff, e.g., LANL Laboratory Directed Research and Development Exploratory Research award *"Listening for rock coatings on Mars: Using acoustic signals from laser-induced breakdown spectroscopy,"* total budget $705k (2020-2023).
- Led planning and execution for multiple domestic and international field research campaigns, e.g., led a

field campaign for nine staff to Haughton crater, Devon Island, Canada (2022).
- Co-Investigator on the SuperCam instrument onboard the NASA Mars 2020 (M2020) rover.
- Mentored and oversaw research of 10+ undergraduate and graduate students, postdocs, and early career staff.

Postdoctoral Research Associate **2012 – 2014**
ISR-2 (Space and Remote Sensing), Los Alamos National Laboratory, Los Alamos, NM
- Developed novel laser-induced breakdown spectroscopy (LIBS) technique to identify and elucidate rock surface coatings and rinds.
- Discovered high manganese materials in Gale crater, Mars and developed a quantification model for manganese abundance in ChemCam spectral data.

EDUCATION
Doctor of Philosophy, Earth and Planetary Sciences, University of New Mexico, Albuquerque, NM (2011)
Master of Arts, Earth and Environmental Sciences, Wesleyan University, Middletown, CT (2006)
Bachelor of Arts, Astronomy, Smith College, Northampton, MA (2001)

SELECTED GRANTS AND FELLOWSHIPS
2023 – 2026 ***Co-Investigator*, LANL LDRD Directed Research award.** "Planetary Exploration Beyond Mars: Advanced Geologic and Astrobiological Scientific Investigations" (PI: A. Ollila + S. Clegg).

2023 – 2024 ***Principal Investigator*, NASA Analog Activities to Support Artemis Lunar Operations.** "Communication structures for science activities during human surface missions." Member of Joint EVA Test Team 5 (JETT5).

2023 ***Co-Investigator*, LANL LDRD Reserve Funds award.** "Planetary Science Investigations" (PI: S. Clegg).

2021 – 2022 ***Principal Investigator*, Explorers Club Discovery Expedition Grant / ALDGS PD funds.** "Finding Life on Mars from Above: Testing the GRAPE Mission Concept at Haughton Crater, Canada." https://explorers.org/about/explorers-club-discovery-expedition-grants

2020 – 2023 ***Principal Investigator*, LANL LDRD Exploratory Research award.** "Listening for rock coatings on Mars: Using acoustic signals from laser-induced breakdown spectroscopy."

2020 – 2023 ***Co-Investigator*, LANL LDRD Directed Research award.** "Uncertainty Quantification for Robust Machine Learning" (PI: D. Oyen).

2019 – 2020 ***Principal Investigator*, LANL LDRD Exploratory Research award.** "Boron and Ribose in Clay: a Precursor for Life on Earth and Mars?"

2019 – 2020 ***Principal Investigator*, NASA Exobiology**. "Discovering biosignatures in manganese deposits on Mars with rover payload instruments."

2020 ***Co-Investigator*, LANL LDRD Reserve Funds award.** "Active sensing for short-range remote detection and characterization." (PI: A. Ollila).

2019 ***Principal Investigator*, LANL LDRD Reserve Funds award**. "Using acoustic signals from LIBS plasma shock waves to identify rock coatings on Mars."

2018 ***Principal Investigator*, LANL Science Investment Small Equipment grant.** "Benchtop Raman and fluorescence spectroscopy."

2017 – 2020 ***Collaborator*, NASA Mars Data Analysis Program.** "Understanding diversity in martian magmatism: Modeling the formation of felsic and alkaline igneous compositions from in-situ data collected on Mars." (PI: A. Udry, UNLV).

2016 – 2019 ***Co-Principal Investigator*, LANL LDRD Exploratory Research award.** "Life on the Edge: Microbes in Rock Varnish." (PI: C. Yeager, LANL).

2016 – 2018 ***Principal Investigator*, LANL LDRD Early Career Award.** "Discovering Biosignatures in Manganese Deposits on Mars."

AWARDS AND HONORS

- NASA Silver Group Achievement Award, SuperCam science (2023).
- NASA Group Achievement Award, Mars 2020 Pre-landing Strategic Science Group (2022).
- Explorers Club Citation of Merit (2022), awarded to the NASA Curiosity ChemCam engineering team, https://discover.lanl.gov/news/0413-chemcam-engineering-team/
- NASA Group Achievement Award, SuperCam Science, Engineering, and Operations Team (2022).
- NASA Group Achievement Award, SuperCam Development Team (2021).
- Elected as a Fellow National, The Explorers Club (2021). https://explorers.org/
- Selected as a Department of Energy Woman @ Energy, https://www.energy.gov/articles/women-energy-dr-nina-lanza (2020).
- LANL Distinguished Performance Award, SuperCam Mars Rover Instrument Team (2019).
- Selected as one of NNSA's "Women integral to the nuclear security enterprise," Women's History Month campaign, https://nnsa.energy.gov/blog/women-integral-nuclear-security-enterprise (2017).
- Rising Stars of Nuclear Science and Engineering, Massachusetts Institute of Technology (2015).
- Selected as a LANL "Woman Who Inspires" (2014).
- LANL Postdoc Distinguished Performance Award (2013).
- Winner, LANL Postdoc Research Day (2013).
- NASA Group Achievement Award, MSL ChemCam Instrument Development and Science Team (2013).
- LANL Large Team Distinguished Performance Award, ChemCam project (2012).

LEADERSHIP

- Principal Investigator, ChemCam instrument, NASA Mars Science Laboratory rover (2021 – present).
- Team Lead, Moon to Mars Team, ISR-1 (Space Science and Applications) (2024 - present).
- Acting Deputy Group Leader, ISR-6 (Space Remote Sensing & Data Science) (2023).
- Team Lead, Space and Planetary Exploration Team, ISR-2/ISR-6 (2019 – 2023).
- Deputy Team Lead, Space and Planetary Exploration Team, ISR-2 (2018 – 2019).
- LANL NASA Program Point of Contact for Planetary Sciences (2017 – present).
- LANL Center for Space and Earth Studies Planetary Science seminar series (2017 – 2023).
- LANL Center for Space and Earth Studies Planetary Science Focus Area Lead (2019).
- Mars 2020 Landing Site Working Group Co-Lead, NE Syrtis megabreccia group (2017).
- Member, Research Library Advisory Board, LANL, Los Alamos, NM (2013 – 2020).

OPERATIONS AND FIELD EXPERIENCE

- Co-lead for new operational Planning Shift for Joint EVA and Human Surface Mobility Test Team 5 (JETT5) test (May 2024). https://www.nasa.gov/mission/joint-eva-test-team-jett/
- Field team member, 10 day expedition to Atacama desert, Chile to acquire biosignature-relevant samples (lead: A. Davila, NASA Ames) (May 2024).
- Led Explorers Club Discovery Expedition Grant field study in Mars analog terrestrial field site in Haughton crater, Canada to develop novel neutron and gamma ray spectroscopy for planetary applications; testing concept of operations for uncrewed aircraft systems (UAS). Featured on "Tales from the Explorers Club" (*Discovery*) (2022). https://www.facebook.com/Discovery/videos/dr-nina-lanza-tales-from-the-explorers-club/826938431639402/
- Supporting current MSL spacecraft operations as ChemCam Payload Uplink Lead and Payload Downlink Lead and Payload Element Lead for Mars Science Laboratory surface operations on Mars (science and engineering roles); continuously staffing instrument operations role from landing in 2012 to present.
- Contributed to Mars 2020 Rover Operations Activities for Science Team Training test (ROASTT) (2019). Analyzed SuperCam data as Payload Downlink Lead, acted as SuperCam instrument representative in Campaign Implementation group.
- Field team member, Antarctic Search for Meteorites (ANSMET), 2015 – 2016 season. Recovered

meteorites from remote field locations in the Miller Range, Antarctica. https://caslabs.case.edu/ansmet/

- NASA Desert Research and Technology Studies (Desert RATS) field exercise, Johnson Space Center, Houston, TX (2011). Acted as Geolab Scicom and EV1 context documentarian. https://www.nasa.gov/exploration/analogs/desertrats/drats2011_midway-report.html
- Mars Science Laboratory Fast Motion Field Test (2011). Analyzed and interpreted ChemCam data of unknown Mars analog field site in preparation for Mars surface operations.
- NASA Desert Research and Technology Studies (Desert RATS) field exercise, Flagstaff, AZ (2010). Participated in tactical, strategic, and field operations. https://www.nasa.gov/exploration/analogs/desertrats/desert_rats_2010.html
- Mars Science Laboratory Slow Motion Field Test (2007). Acted as ChemCam Payload Downlink Lead in preparation for Mars surface operations.

SELECTED OUTREACH ACTIVITIES

Television/Streaming

"What an Antarctic disaster can teach us about getting to Mars." *Uncharted Expeditions*, PBS Terra (6 May 2024). https://www.youtube.com/watch?v=KA2uA9sJ068 (15 min 09 s)

"Loucos ou corajosos? Billionarios reuniram-se para discutir ideias loucas." *Jornal Nacional*, TVI (20 May 2024). https://tviplayer.iol.pt/programa/jornal-nacional/63e6588b0cf2665294d4f012/video/664b9ddc0cf2cd207b7cd0fa (9 min 27 s)

"Life on Mars? Scientists reveal new evidence for habitability." Interview with Phil Halper (10 May 2024). (https://www.youtube.com/watch?v=161um39Ahtk&t=1s (21 min 23 s)

"Dispatches from the Well." *Big Think* (2023). Trailer: https://youtu.be/R8GoBFy1DgQ?si=QKakMFCaSnv08642 (2 min 22 s)

Host of Lift the Ice episode 4: "The Ice is Alien." *Curiosity Stream* (2023). https://curiositystream.com/video/6074

How the Universe Works, Seasons 4, 5, 6, 7, 8, 9, 10, and 11 (2014-2023). *The Science Channel.* http://www.sciencechannel.com/tv-shows/how-the-universe-works/

"Mankind's first sample return," Cosmic Front (in Japanese), *NHK* (aired 16 February 2023). https://www.nhk.jp/p/cosmic/ts/WXVJVPGLNZ/

"Highest Highs, Lowest Lows," Tales from the Explorers Club, season 1, episode 1. *Discovery Channel.* https://www.facebook.com/Discovery/videos/dr-nina-lanza-tales-from-the-explorers-club/826938431639402/

"Is There Life on Mars?" Science's Greatest Mysteries, Season 1, Episode 5, *BBC* (2022). https://www.bbcselect.com/watch/sciences-greatest-mysteries/

"Finding Life on Mars," Secrets of the Universe, Season 1, Episode 6, *Curiosity Stream* (2022). https://curiositystream.com/video/4271

"Is there life on Mars?" Global Exploration Summit, Season 1, Episode 6, *Discovery+* (2021). https://www.discoveryplus.com/show/the-explorers-club

"Mars: One Day on the Red Planet," *National Geographic TV* (special) (2020). https://www.natgeotv.com/za/shows/natgeo/mars-one-day-on-the-red-planet

"Space Rock Hunter," Daily Planet (Discovery Canada), Treasure Seekers Week, season 21 episode 73 (aired 13 April 2016). https://www.bellmedia.ca/the-lede/press/shiver-me-timbers-daily-planet-uncovers-extraordinary-finds-during-all-new-treasure-seekers-week-beginning-april-11-on-discovery/

Video

"Exploring the Unknown" Ep. 1, Dubai Future Forum Mini-Series, 8 January 2026: https://www.youtube.com/watch?v=vRvt9WNCEfw (5 min 4 s)

"Revealing the martian soundscape," *GLEX Summit 2023*, Terceira, Azores, 14 June 2023: https://www.youtube.com/watch?v=7je0RqbUjAc (12 min 54 s)

"Why we are testing autonomous drones in the Arctic to improve future Mars research," 26 April 2023: https://www.youtube.com/watch?v=FQaJ3r12BgE (4 min 09 s)

"10 years on Mars: The Curiosity rover's journey," 5 August 2022: https://www.youtube.com/watch?v=NEtQKvyQw_I (2 min 51 s)

"NASA's Perseverance rover captures the sounds of Mars," 18 October 2021: https://youtu.be/GHenFGnixzU (3 min 15 s)

"What do sounds sound like on Mars?" TikTok video for National Space Day with CBS Unstoppable and Department of Energy, 7 May 2021: https://twitter.com/LosAlamosNatLab/status/1390710905911054336 (44 s).
"Perseverance: What music sounds like on Mars," 18 February 2021: https://www.youtube.com/watch?v=Z7C4mR588d0 (2 min 55 s)
"Life on Mars? Rock varnish could hold the answer," 4 December 2018: https://www.youtube.com/watch?v=gNm9HCj--Q0&t=4s (2 min 10 s)
Santa Fe March for Science 2017, Santa Fe, NM, 22 April 2017: https://www.youtube.com/watch?v=WHfmaL2vlL8 (7 min 47 s)
"ChemCam update: Manganese oxides on Mars," 30 June 2016: https://www.youtube.com/watch?v=oayVInNUq8w (1 min 40 s)
"Los Alamos Science in 60," 8 December 2015: https://www.youtube.com/watch?v=i_Qs7Arnff4 (1 min 22 s)
Los Alamos Women Who Inspire, 6 May 2014: https://www.youtube.com/watch?v=bLmY9EDYWW0 (3 min 30 s)
NASA Curiosity Rover Report, Pasadena, CA, 26 October 2012: http://www.youtube.com/watch?v=iDgv14Qtl1c&noredirect=1 (2 min 20 s)

Podcasts

"This is what Mars sounds like, with Nina Lanza," *Gravity Assist*, 17 June 2022 (22 min 27 s): https://www.nasa.gov/mediacast/gravity-assist-this-is-what-mars-sounds-like-with-nina-lanza
"Explorers Club – Nina Lanza," *Curiosity Daily*, 10 June 2022 (16 min 6 s): https://www.discovery.com/podcasts/curiosity-daily-podcast/nina-lanza
"Nina Lanza and Tony Nelson," *Unconventional Engineering (ep.5)*, 8 April 2022: https://soundcloud.com/user-583367487/unconventional-engineering-ep-5-nina-lanza-and-tony-nelson
"Life's Tough, but Explorers are Tougher," 4 March 2021 (20 min 27 s): https://www.youtube.com/watch?v=4NspwsxtOak
"Diamonds in the Ice," *On A Mission (JPL)*, 26 November 2019 (40 min 36 s): https://www.jpl.nasa.gov/podcast/on-a-mission/s2/e8/
"Meteorite Hunting in Antarctica," *Third Pod From the Sun (AGU)*, 7 November 2019 (episode 23) (14 min 27 s): https://thirdpodfromthesun.com/2019/11/07/e23-bonus-clip-meteorite-hunting-in-antarctica/
"9th International Mars Conference (feat. Nina Lanza)," *WeMartians* (47 min 20 s): https://www.wemartians.com/episode063/
'"The Meteorite Hunter," *Undiscovered*, 16 March 2017 (32 min 32 sec): http://www.undiscoveredpodcast.org/the-meteorite-hunter.html

Radio

NPR Morning Edition, 25 February 2021 (6 min 43 s): https://www.npr.org/2021/02/25/971261718/nasas-mars-mission-goal-find-evidence-of-past-life-on-the-red-planet
BBC Radio 4 Broadcasting House, 21 February 2021 (starting at 19:40, 5 min): https://www.bbc.co.uk/sounds/play/m000sgvc
NPR Morning Edition, 11 February 2021 (3 min 48 s): https://www.npr.org/2021/02/11/966757175/microphones-on-nasas-rover-will-record-audible-sounds-on-mars
Radio Café, KUNM, Albuquerque, NM, 12 April 2017 (41 min 37 sec): http://radiocafe.media/?s=lanza
Santa Fe Radio Café, KSFR, Santa Fe, NM 1 March 2016 (32 min 16 s): http://www.santaferadiocafe.org/science/2016/03/01/nina-lanza/
Science Friday, 29 January 2016: http://www.sciencefriday.com/segments/confessions-of-a-meteorite-hunter/ (16 min 49 s)
New Mexico People Places and Ideas, KUNM, Albuquerque, NM, 6 February 2015: http://www.stephenspitz.com/2015/02/ (28 min 30 s)

Writing

"Designing a drone that can search for life on other planets." *Space.com*, 3 March 2023: https://www.space.com/designing-drone-search-alien-life-op-ed

"Why Premature Claims of Life on Mars Hurt Science." *Scientific American, Observations blog*, 14 January 2020: https://blogs.scientificamerican.com/observations/why-premature-claims-of-life-on-mars-hurt-science/

"Did Life Sign the Guestbook on Mars?" *Scientific American, Observations blog*, 18 July 2019 (with C. Yeager): https://blogs.scientificamerican.com/observations/did-life-sign-the-guest-book-on-mars/

Social media

- Blog Tsarina for ANSMET field team (2015 – 2016 season). https://caslabs.case.edu/ansmet/2015/
- Official microblogger, Lunar and Planetary Science Conference, 2013-2018 (@marsninja).

REFEREED BOOK CHAPTERS (2)

Lanza, N.L., Wiens, R.C., Maurice, S., and Johnson, J. (2020). "Elemental Analyses of Mars from Rovers with Laser-Induced Breakdown Spectroscopy by ChemCam and SuperCam," in *Remote Compositional Analysis: Techniques for Understanding Spectroscopy, Mineralogy, and Geochemistry of Planetary Surfaces*, Eds: Janice L. Bishop, Jeffrey Moersch, and James F. Bell, III, Cambridge University Press.

Lanza, N.L. and Newsom, H.E. (2013). Extraterrestrial Hillslope Processes. In: Stoffel, M. and Marston, R. (Eds.), *Treatise on Geomorphology* v.7: Mountain and Hillslope Geomorphology. Elsevier, Amsterdam, 382-396.

REFEREED JOURNAL PUBLICATIONS (82)

Comellas, J.M., Essunfeld, A., Morris, R.A., Gasda, P.J., **Lanza, N.L.**, Sharma, S.K., Huynh, A.K., Das, D., Bedford, C.C., Dehouck, E., Clark, B.C., Fischer, W., Lueth, V., Delapp, D., Clegg, S., Gasnault, O., Wiens, R.C. (2026). Elevated-Mn ChemCam targets illuminating Mn redox cycling and diagenesis in the Bradbury Rise, Gale Crater, Mars. *Icarus* 447, 116902.

Garczynski, B.J., Horgan, B.H.N., Johnson, J.R., Rice, M.A., Mandon, L., Chide, B., Bechtold, A., Beck, P., Bell III, J.F., Dehouck, E., Fairen, A., Gomez, F., Mslin, P.-Y., Paar, G., Sephton, M.A., Simon, J.I., Traxler, C., Vaughan, A.F., Wiens, R.C., Bertrand, T., Beyssac, O., Brown, A.J., Cardarelle, E.L., Cloutis, E., Duflot, L., Flannery, D.T., Gasda, P.J., Hayes, A.G., Herd, C., Kah, L.C., Kinch, K.M., **Lanza, N.L.**, Merusi, M., Mllion, C., Nunez, J.I., Ollila, A.M., Royer, C., St. Clair, M., Tate, C., and Yanchilina, A.G. (2025). Rock coatings as evidence for late surface alteration on the floor of Jezero crater, Mars. *Journal of Geophysical Research Planets* 130(9), e2025JE009242.

DeBenedictis, E.A., Kite, E.S., Wordsworth, R.D., Lanza, N.L., Cockell, C.S., Silver, P.A., Ramirez, R.M., Cumbers, J., Mohseni, H., Mason, C.E., Fischer, W.W., and McKay, C.P. (2025). The case for Mars terraforming research. *Nature Astronomy*, https://doi.org/10.1038/s41550-025-02548-0 **[journal cover].**

Essunfeld, A., Comellas, J.M., Morris, R.A., Gasda, J.P., Delapp, D., Oyen, D., Bedford, C.C., Clark, B.C., Dehouck, E., Anderson, R.B., Lomashvili, A., Wiens, R.C., Clegg, S.M., Gasnault, O., **Lanza, N.L.** (2025). Attribute recognition: A new Method for grouping planetary images by visual characteristics, using the example of Mn-rich rocks in the floor of Gale crater, Mars. *Icarus* 429, 116451. https://doi.org/10.1016/j.icarus.2024.116451

Kalucha, H., Broz, A., Randazzo, N., Aramedia, J., Madariaga, J., Garczynski, B., **Lanza, N.**, Mandon, L., Fouchet, T., Catling, D.C., Farien, A.G., Kivrak, L., Gasda, P.J., Nunez, J.I., Cloutis, E., Hand, K.P., Rice Jr., J.W., Fischer, W.W., Maurice, S., and Wiens, R.C. (2024). Probable concretions observed in the Shenandoah Formation of Jezero crater, Mars and comparison with terrestrial analogs. *Journal of Geophysical Research Planets* 129(8), e2023JE008138.

Gasda, P.J., **Lanza, N.L.**, Meslin, P.-Y., Lamm, S.N., Cousin, A., Anderson, R., Forni, O., Swanner, E., L'Haridon, J., Frydenvang, J., Thomas, N., Gwizd, S., Stein, N., Fischer, W.W., Hurowitz, J., Sumner, D., Rivera-Hernandez, F., Crossey, L., Ollila, A., Essunfeld, A., Newsom, H.E., Clark, B., Wiens, R.C., Gasnault, O., Clegg, S.M., Maurice, S., Delapp, D., and Reyes-Newell, A. Manganese-rich sandstones as an indicator of ancient oxic lake water conditions in Gale crater, Mars (2024). *Journal of Geophysical Research Planets* 129(5), e20203JE007923. https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2023JE007923

Beck, P., Meslin, P.-Y., Fau, A., Gasnault, O., Lasue, J., Cousin, C., Schroder, S., Maurice, S., Rapin, W., Wiens, R.C., Ollila, A.M., Dehouck, E., Mangold, N., Garcia, B., Schwartz, S., Goetz, W., and **Lanza, N.** (2024).

Detectability of carbon with ChemCam LIBS: Distinguishing sample from Mars atmospheric carbon, and application to Gale crater. *Icarus* 408, 115840, https://doi.org/10.1016/j.icarus.2023.115840.

Rapin, W., G. Dromart, B.C. Clark, J. Schieber, E.S. Kite, L.C. Kah, L.M. Thompson, O. Gasnault, J. Lasue, P.-Y. Meslin, P.G. Gasda, and **N.L. Lanza** (2023). Sustained wet-dry cycling on early Mars. *Nature* 620, doi: 10.1038/s41586-023-06220-3.

Trieman, A.H., **Lanza, N.L.**, et al. (2023). Manganese-iron nodules at the Groken site, Gale crater, Mars. Minerals 13(9), 1122. doi.org/10.3390/min13091122.

Chide, B. **Lanza, N.L.**, et al. (2023). Measurements of sound propagation in Mars' lower atmosphere. *Earth and Planetary Science Letters* 615 (118200). https://doi.org/10.1016/j.epsl.2023.118200

Manelski, H.T., R.Y. Sheppard, A.A. Fraeman, R.C. Wiens, J.R. Johnson, E.B. Rampe, J. Frydenvang, **N.L. Lanza**, and O. Gasnault (2023). Compositional Variations in Sedimentary Deposits in Gale Crater as Observed by ChemCam Passive and Active Spectra, *Journal of Geophysical Research Planets* 128(3), doi: 10.1029/2022JE007706.

Nellessen, M.A., Gasda, P., Crossey, L., Peterson, E., Ali, A., Zhang, J., Zhou, W., Hao, M., Spilde, M., Newsom, H., **Lanza, N.**, Reyes-Newell, A., Legett, S., Das, D., Delapp, D., Yeager, C., Labouriau, A., Clegg, S., and R.C. Wiens (2023). Boron adsorption in clay minerals: Implications for martian groundwater chemistry and boron on Mars, *Icarus* 401, article 115599, doi: 10.1016/j.icarus.2023.115599.

Goetz, W., E. Dehouck, P.J. Gasda, J.R. Johnson, P-Y. Meslin, **N.L. Lanza**, R.C. Wiens, W. Rapin, J. Frydenvang, V. Payré, and O. Gasnault, Detection of copper by the ChemCam instrument along Curiosity's traverse in Gale crater, Mars: Elevated abundaces in Glen Torridon (2023). *Journal of Geophysical Research Planets* 128(3), doi: 10.1029/2021JE007101.

Alvarez-Llamas, C., **Lanza, N.L.**, and 35 coauthors (2023). The sound of geological targets on Mars from the absolute intensity of laser-induced sparks shock waves. Spectrochimica Acta B: Atomic Spectroscopy 205, 106687.

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