

Nina Lanza

Updated March 2023

RESEARCH EXPERIENCE

- 2021 – present **Principal Investigator, ChemCam instrument**
NASA Mars Science Laboratory (Curiosity) rover mission
Leading international team of 50+ scientists and engineers to operate, maintain, and analyze data from ChemCam instrument onboard the NASA Mars Science Laboratory (MSL) rover.
- 2019 – present **Team Lead, Space and Planetary Exploration Team / Staff Scientist (Scientist III)**
ISR-6 (Space Remote Sensing & Data Science), Los Alamos National Laboratory, Los Alamos, NM. Team lead of planetary team in ISR-6 (previously ISR-2); studying biosignature potential of manganese-rich materials with LIBS; quantifying LIBS ablation rates in geological materials using LIBS spectral and acoustic data; supporting ChemCam operations for Mars Science Laboratory rover mission.
- 2018 – 2019 **Deputy Team Lead, Space and Planetary Exploration Team / Staff Scientist (Scientist III)**
ISR-2 (Space and Remote Sensing), Los Alamos National Laboratory, Los Alamos, NM
- 2014 – 2018 **Staff Scientist (Scientist II)**
ISR-2 (Space and Remote Sensing), Los Alamos National Laboratory, Los Alamos, NM
Led study of manganese in Gale crater, Mars and quantified manganese abundance in LIBS spectral data for ChemCam and SuperCam; supporting ChemCam operations for Mars Science Laboratory rover mission.
- 2012 – 2014 **Postdoctoral Research Associate**
ISR-2 (Space and Remote Sensing), Los Alamos National Laboratory, Los Alamos, NM
Studied geological materials related to rock-soil-atmosphere interactions including surface coatings and rinds with laser-induced breakdown spectroscopy; supported ChemCam operations for Mars Science Laboratory rover mission.

EDUCATION

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

SELECTED GRANTS AND FELLOWSHIPS

- 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.** “Finding Life on Mars from Above: Testing the GRAPE Mission Concept at Houghton 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.”
- 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

- Explorers Club Citation of Merit, awarded to the NASA Curiosity ChemCam engineering team, <https://discover.lanl.gov/news/0413-chemcam-engineering-team/> (2022).
- 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).
- 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, Space and Planetary Exploration Team, ISR-2/ISR-6 (2019 – present).
- 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 – present).
- 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

- 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-ales-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

- How the Universe Works, Seasons 4, 5, 6, 7, 8, 9, and 10 (2014-2022). *The Science Channel*.
<http://www.sciencechannel.com/tv-shows/how-the-universe-works/>
- “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.bbselect.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

- “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=WHfmaL2vIL8> (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=iDgv14Qt1lc&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-landa>

“Explorers Club – Nina Lanza,” *Curiosity Daily*, 10 June 2022 (16 min 6 s):

<https://www.discovery.com/podcasts/curiosity-daily-podcast/nina-landa>

“Nina Lanza and Tony Nelson,” *Unconventional Engineering (ep.5)*, 8 April 2022:

<https://soundcloud.com/user-583367487/unconventional-engineering-ep-5-nina-landa-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=landa>

Santa Fe Radio Café, KSFR, Santa Fe, NM 1 March 2016 (32 min 16 s):

<http://www.santaferadiocafe.org/science/2016/03/01/nina-landa/>

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

“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 (Twitter handle @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 (61)

- 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 abundances in Glen Torridon (in press). *Journal of Geophysical Research Planets*, doi: 10.1029/2021JE007101.
- Chide, B., Bertrand, T., Lorenz, R.D., Munguira, A., Hueso, R., Sanches-Lavega, A., Martinez, G., Spiga, A., Jacob X., de la Torre Juarez, M., Lemmon, M.T., Banfield, D., Newman, C.E., Murdoch, N., Stott, A., Viudez-Moreiras, D., Pla-Garcia, J. Larmat, C., **Lanza, N.L.**, Rodriguez-Manfredi, J.A., and Wiens, R.C. (2022). Acoustics reveals short-term air temperature fluctuations near Mars' surface. *Geophysical Research Letters* 49(21), e2022GL100333.
- Wiens, R.C., Udry, A., Beyssac, O., Quantin-Natad, C., Mangold, N., Cousin, A., Mandon, L., Bosak, T., Forni, O., McLennan, S.M., Sautter, V., Brown, A., Benzerara, K., Johnson, J.R., Mayhew, L., Maurice, S., Anderson, R.B., Clegg, S.M., Crumpler, L., Gabriel, T.S.J., Gasda, P., Hal, J., Horgan, B.H.N., Kah, L., Legett IV, C., Madariaga, J.-M., Meslin, P.-Y., Ollila, A.M., Poulet, F., Royer, C., Sharma, S.K., Siljestrom, S., Simon, J.I., Acosta-Maeda, T.E., Alvarez-Llamas, C., Angel, S.M., Arana, G., Beck, P., Bernard, S., Bertrand, T., Bousquet, B., Castro, K., Chide, B., Clave, E., Cloutis, E., Connell, S., Dehouck, E., Dromart, G., Fischer, W., Fouchet, T., Francis, R., Frydenvang, J., Gasnault, O., Gibbons, E., Gupta, S., Hausrath, E.M., Jacob, X., Kalucha, H., Kelly, E., Knutsen, E., **Lanza, N.**, Laserna, J., Lasue, J., Le Mouélic, S., Leveille, R., Lopez Reyes, G., Lorenz, R., Manrique, J.A., Martinez-Frias, J., McConnochie, T., Melikechi, N., Mimoun, D., Montmessin, F., Moros, J., Murdoch, N., Pilleri, P., Pilorget, C., Pinet, P., Rapin, W., Rull, F., Schroder, S., Shuster, D.L., Smith, R.J., Stott, A.E., Tarnas, J., Turenne, N., Veneranda, M., Vogt, D.S., Weiss, B.P., Willis, P., Stack, K.M., Williford, K.H., Farley, K.A., and the SuperCam Team (2022). Compositionally and density stratified igneous terrain in Jezero crater, Mars. *Science Advances* 8(34), doi: 10.1126/sciadv.abo3399.
- Anderson, R.B., O. Forni, A. Cousin, R.C. Wiens, S.M. Clegg, J. Frydenvang, T.S.J. Gabriel, A. Ollila, S. Schröder, O. Beyssac, E. Gibbons, D.S. Vogt, E. Clavé, J.-A. Manrique, C. Legett IV, P. Pilleri, R.T. Newell, J. Sarrao, S. Maurice, G. Arana, K. Bezerara, P. Bernardi, S. Bernard, B. Bousquet, A.J. Brown, C. Alvarez-Llamas, B. Chide, E. Cloutis, J. Comellas, S. Connell, E. Dehouck, D. Delapp, A. Essunfeld, C. Fabre, T. Fouchet, C. Garcia-Florentino, L. García-Gómez, P. Gasda, O. Gasnault, E.M. Hausrath, **N.L. Lanza**, J. Laserna, J. Lasue, G. Lopez, J.A. Madariaga, L. Mandon, N. Mangold, P.-Y. Meslin, A.E. Nelson, H. Newsom, A.L. Reyes-Newell, S. Robinson, F. Rull, S. Sharma, J.I. Simon, P. Sobron, I.T. Fernandez, A. Udry, D. Venhaus, S.M. McLennan, D.V. Morris, and B. Ehlmann (2022). Post-landing major element quantification using SuperCam laser induced breakdown spectroscopy. *Spectrochimica Acta Part B* 188, 106347, <https://doi.org/10.1016/j.sab.2021.106347>.
- Maurice, S., B. Chide, N. Murdoch, R. D. Lorenz, D. Mimoun, R. C. Wiens, A. Stott, X. Jacob, T. Bertrand, F. Montmessin, **N. L. Lanza**, C. Alvarez-Llamas, S. M. Angel, M. Aung, J. Balaram, O. Beyssac, A. Cousin, G. Delory, O. Forni, T. Fouchet, O. Gasnault, H. Grip, M. Hecht, J. Hoffman, J. Laserna, J. Lasue, J. Maki, J. McClean, P.-Y. Meslin, S. Le Mouélic, A. Munguira, C. E. Newman, J. A. Rodríguez Manfredi, J. Moros, A. Ollila, P. Pilleri, S. Schröder, M. de la Torre Juárez, T. Tzanetos, K. M. Stack, K. Farley, K. Williford, and the SuperCam team (2022). In situ recording of Mars soundscape. *Nature* 605, 653–658.
- VanBommel, S.J., R. Gellert, J.A. Berger, M.A. McCraig, C.D. O'Connell-Cooper, L.M. Thompson, A.S. Yen, N.I. Boyd, **N.L. Lanza**, and A.M. Ollila (2022). Constraining the chemical depth profile of a manganese-rich surface layer in Gale crater, Mars. *Spectrochimica Acta Part B: Atomic Spectroscopy* 191, article 106410, doi: 10.1016/j.sab.2022.106410.
- Gasda, P.J., J. Comellas, A. Essunfeld, D. Das, A. B. Bryk, E. Dehouck, S. P. Schwenzer, L. Crossey, K. Herkenhoff, J. R. Johnson, H. Newsom, **N. L. Lanza**, W. Rapin, W. Goetz, P.-Y. Meslin, J. C. Bridges, R. Anderson, G. David, S. M. R. Turner, M. T. Thorpe, L. Kah, J. Frydenvang, R. Kronyak, G. Caravaca, A. Ollila, S. Le Mouélic, M. Nellessen, M. Hoffman, D. Fey, A. Cousin, R. C. Wiens, S. M. Clegg, S. Maurice, O. Gasnault, D. Delapp, and A. Reyes-Newell (2022). Overview of the Morphology and Chemistry of Diagenetic Features in the Clay-Rich Glen Torridon Unit of Gale Crater, Mars. *Journal of Geophysical Research Planets* 127(12), doi: 10.1029/2021JE007097.
- Caravaca, G., N. Mangold, E. Dehouck, J. Schieber, L. Zaugg, A.B. Bryk, C.M. Fedo, S. Le Mouélic, L. Le Deit, S.G. Banham, S. Gupta, A. Cousin, W. Rapin, O. Gasnault, F. Rivera-Hernández, R.C. Wiens, and **N.L.**

- Lanza**. From Lake to River: Documenting an Environmental Transition across the Jura/Knockfarril Hill Members Boundary in Glen Torridon Region of Gale crater (Mars). *Journal of Geophysical Research Planets* 127(9), doi: 10.1029/2021JE007093.
- Dehouck, E., A. Cousin, N. Mangold, J. Frydenvang, O. Gasnault, O. Forni, W. Rapin, P.J. Gasda, G. Caravaca, G. David, C.C. Bedford, J. Lasue, P-Y Meslin, K. Rammelkamp, M. Desjardins, S. Le Mouélic, M. T. Thorpe, V.K. Fox, K.A. Bennett, A.B. Bryk, **N.L. Lanza**, S. Maurice, and R.C. Wiens (2022). Bedrock geochemistry and alteration history of the clay-bearing Glen Torridon region of Gale crater, Mars *Journal of Geophysical Research Planets* 127(12), doi: 10.1029/2021JE007103.
- David, G., E. Dehouck, P.-Y. Meslin, W. Rapin, A. Cousin, O. Forni, O. Gasnault, J. Lasue, N. Mangold, P. Beck, S. Maurice, R.C. Wiens, G. Berger, S. Fabre, P. Pinet, B.C. Clark, J.R. Smith, and **N.L. Lanza** (2022). Evidence for Amorphous Sulfates as the Main Carrier of Soil Hydration in Gale Crater, Mars. *Geophysical Research Letters* 49(21), doi: 10.1029/2022GL098755.
- Lingappa, U.F., Yeager, C.M., Sharma, A, **Lanza, N.L.**, Morales, D.P., Xie, G., Atencio, A.D., Chadwick, G.L., Monteverde, D.R., Magyar, J.S., Webb, S.M., Valentine, J.S., Hoffman, B.M., Fischer, W.W. (2021). Manganese in rock varnish derives from Cyanobacteria. *Proceedings of the National Academy of Sciences* 118 (25), e2025188118, <https://doi.org/10.1073/pnas.2025188118>.
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- Clark, B.C., Kolb, V.M., Steele, A., House, C.H., **Lanza, N.L.**, Gasda, P.J., VanBommel, S.J., Newsom, H.E., and Martinez-Frias, J. (2021). Origin of life on Mars: Suitability and Opportunities. *Life* 11 (6), 539, <https://doi.org/10.3390/life11060539>.
- Caravaca, G., Le Mouélic, S., Rapin, W., Dromart, G., Gasnault, G., Fau, A., Newsom, H.E., Mangold, N., Le Diet, L., Maurice, S., Wiens, R.C., and **Lanza, N.L.** (2021). Long-distance 3D reconstructions using photogrammetry with Curiosity's ChemCam remote micro-imager in Gale crater (Mars). *Remote Sensing* 13, 4068, <https://doi.org/10.3390/rs13204068>.
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- Wiens, R.C., **Lanza, N.L.**, and 129 coauthors (2021). The SuperCam instrument suite on the NASA Mars 2020 rover: Body unit and combined system tests. *Space Science Reviews* 217 (article 4), <https://link.springer.com/article/10.1007/s11214-020-00777-5>.
- Maurice, S., **Lanza, N.**, and 162 coauthors (2021). The SuperCam instrument on the Mars 2020 rover: Science objectives and mast-unit description. *Space Science Reviews* 217 (47), <https://doi.org/10.1007/s11214-021-00807-w>.
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