

LESLIE K. TAMPPARI

JET PROPULSION LABORATORY
M/S 264-623, 4800 OAK GROVE DR.
PASADENA, CA 91109
(818) 393-1226

Education

Ph.D., Geophysics and Space Physics, University of California, Los Angeles (2000)
M.S., Geophysics and Space Physics, University of California, Los Angeles (1997)
B.S., Mathematics, University of Arizona, (1990)

Research Interests

- Water cycling in the north polar region of Mars
- Water-ice cloud detection and interannual variability on Mars
- Martian dust: interannual variability, diurnal variability, dust devils
- Martian analog studies in the Antarctic Dry Valleys
- LIDAR and sub-mm instrument development for measuring doppler winds

Professional Experience

Jet Propulsion Laboratory (1990 – present)

Deputy Project Scientist, Mars Reconnaissance Orbiter Project (2012-present)
PI, Spontaneous Concept for studying a surface sub-mm sounder (FY 2020)
Co-I, lead scientist for provision of sub-mm sounder for Discovery mission (2019)
PI, Strategic University Research Program, partnered with Dr. Don Banfield, Cornell (FY 2019)
PI, sub-mm sounder for wind/water Mars atmospheric profiles (2016-present)
Co-Investigator, Mars Environmental Dynamics Analyzer, Mars 2020 Rover (2014-present)
PI, Center Innovation Fund, FY 2018
Co-Investigator, NIAC (2013-2014)
Deputy Project Scientist, ExoMars Trace Gas Orbiter Project (2010-2012)
Principal Investigator, NASA Mars Data Analysis Program (2010-present)
Co-Investigator, Mars Fundamental Research program (2009-present)
Principal Investigator, NASA International Polar Year (2007-2010)
Principal Investigator, JPL R&TD program (2005-2010); Co-I (2014-2015)
Project Scientist, NASA Phoenix Scout Mission (2003–2009)
Co-Investigator, NASA Phoenix Scout Mission (2002–2009)
Deputy Project Scientist, NASA Mars Science Laboratory (2001-2003)
Principal Investigator, NASA Mars Global Surveyor Data Analysis Program (2001-2004)
Principal Investigator, NASA Mars Data Analysis Program (2000-2003)
Co-Investigator, NASA Jupiter Data Analysis Program (1998-2000)
Science Lead, Team-X, Europa and Titan future mission studies (1999–2001)
Science Coordinator, Galileo Photopolarimeter/Radiometer Experiment (1990–1999)
Deputy Lead, JPL Satellites Working Group (1993-1997)
Deputy Lead, Science Instrument Testbed Team (1996)

Awards

People Leadership Award (2016)
Team Leader for NASA GAA – Comet Siding Spring Observing Team (2015)
Mariner Outstanding Accomplishment Award (2004, 2005, 2006, 2007, 2 in 2014)
Mariner Outstanding Accomplishment Award (Aug. 2011) – for manuscript “Martian water ice clouds: A view from Mars Global Surveyor Thermal Emission Spectrometer”
Mariner Outstanding Accomplishment Award (July 2009) – for manuscript “The atmospheric environment expected for the Phoenix landed season and location”
NASA Exceptional Achievement Medal recipient (June 2009)
Stellar Award Nomination (2009)

Explorer Outstanding Accomplishment Award (2009)
Team Bonus Award – Phoenix (2008)
Ranger Outstanding Accomplishment Award (2002)
NASA Exceptional Achievement Medal recipient (April 1998)
Nova award “Initiative and Excellent Overview” (June 1997)
Multiple NASA Group Achievement awards; including Comet Siding Spring Observing (2015)

Professional Activities

Synthesis committee member for 7th International Conference on Mars Polar Science and Exploration (2019)
Ice, Climate Evolution Science Advisory Group member (2018-19)
Main Science Organizer for Mars Science Session for COSPAR 2018, 2020
NEX-SAG: Science Advisory Group member for next Mars Orbiter (2015)
Organizer and Guest Editor for Icarus special issue – “Dynamic Mars” (2013-15; Issue date: May 1, 2015)
Organizer and Co-convener of “Dynamic Mars” Special Session at Fall AGU (2013)
8th International Conference on Mars scientific organizing committee (2013)
DPS prize sub-committee (2011, 2012)
5th Mars Polar Conference organizing committee (Sept. 2011)
Organizer and co-convener of a Phoenix Special Session at AGU (2008)
Organizer and guest editor for JGR-Planets special issue on Phoenix instruments, landing sites, and operations (2008)
7th International Conference on Mars scientific organizing committee (2007)
4th Mars Polar Conference scientific organizing committee (Oct. 2006)
JPL Science and Technology Advisory Group (2005-2011)
NASA PG&G Review Panel (2002-2003)
NASA Mars Reconnaissance Orbiter Instrument Review Panel (2001)
American Geophysical Union (AGU) member (since 2000)
American Astronomical Society, Division of Planetary Sciences member (since 1995)

Mentoring Experience

Yolanda Torres, Caltech Summer Undergraduate Research Fellowship, 2003
Project title: Water-ice clouds over Hellas Basin – a Historical Perspective
Dr. Zheng Qu, Caltech Post-doctoral fellow, 2003-2005
Focus area: Water-ice clouds and transport in the north polar region of Mars
Nathan Drake, Caltech Summer Undergraduate Research Fellowship, 2005
Project title: Dust devils in the northern polar region of Mars
Dr. Alexey Pankine, JPL Post-doctoral fellow, 2007-2010
Project title: Mars Spring and Summer North Polar Water Vapor Mapping, New Retrievals and Interannual Comparison
Vivian Sun, Caltech Summer Undergraduate Research Fellowship, 2011
Project title: Detecting Dust Devil Tracks and Wind Streaks in the North Polar Region of Mars
Danika Wellington, Caltech Summer Undergraduate Research Fellowship, 2011
Project title: An Analysis of the Presence of Hydrogen Peroxide on Mars from Mariner 9 UVS data
Nina Miller, JPL Maximizing Student Potential (MSP) in STEM internship program
Project title: Investigation of high-frequency oscillations in REMS T data
Vicente Ochoa, Caltech Summer Undergraduate Research Fellowship, 2018
Project title: Dust Devils
Brian Ward, Maximizing Student Potential in STEM program, 2020
Project title: Evaluation of Mars Global Water Cycle
Cecilia Leung, NASA Post-doctoral Program Fellowship, 2020
Project title: Investigating the Regional Water Cycle on Mars at Gale Crater and the Phoenix Landing Site

Publications

- Tamppari, L. K.**, and M. T. Lemmon, 2020. Near-Surface atmospheric water vapor enhancement at Phoenix, *Icarus*, 343, 113624, <https://doi.org/10.1016/j.icarus.2020.113624>
- Tamppari, L. K.**, *et al.*, 2011. Effects of Extreme Cold and Aridity on Soils and Habitability: McMurdo Dry Valleys as an Analog for the Mars Phoenix Landing Site, *Antarctic Science*, doi:10.1017/S0954102011000800.
- Tamppari, L. K.**, *et al.*, 2009. Phoenix and MRO Coordinated Atmospheric Measurements, *J. Geophys. Res.*, 115, E00E17, doi:10.1029/2009JE003415, 2010
- Tamppari, L. K.**, *et al.*, 2008. The expected atmospheric characteristics during the Phoenix mission, *J. Geophys. Res.*, 113 (E00A20), doi:10.1029/2007JE003034.
- Tamppari, L. K.**, M. D. Smith, D. S. Bass, A. S. Hale, 2008. Water-ice clouds and dust in the north polar region of Mars using MGS TES data, *Planetary and Space Sciences* **56**, 227-245.
- Tamppari, L. K.**, R. W. Zurek, D. A. Paige, 2002. Viking Era Diurnal Water Ice_Clouds, *J. Geophys. Res.*, 108(E7), p. 5073.
- Tamppari, L. K.**, 2000. Mars Missions, *Space Sciences*, Vol. 4, pp. 98-101, Macmillan Reference USA.
- Tamppari, L. K.**, R. W. Zurek, D. A. Paige, 2000. Viking Era Water Ice Clouds, *J. Geophys. Res.*, **105 (E2)**, pp. 4087-4107.
- Tamppari, L. K.**, J. R. Spencer, T. Z. Martin, 1995. Observing the Icy Jovian Satellites with the Galileo Photopolarimeter Radiometer Instrument, *J. Geophys. Res.*, **100 (E9)**, pp. 18973-18983.
- McEwen, A. S., Ethan I. Schaefer, Colin M. Dundas, Sarah S. Sutton, **Leslie K. Tamppari**, Matthew Chojnack, 2021. Mars: Abundant Recurring Slope Lineae (RSL) Following the Planet-Encircling Dust Event (PEDE) of 2018, *J. Geophys. Res.*, DOI: 10.1029/2020JE006575.
- Golombek, M *et al.*, 2020. Location and Setting of the InSight Lander, Instruments and Landing Site, *Earth and Sp. Sci.*, DOI: 10.1029/2020EA001248
- Savijärvi, H. I., G. M. Martinez, E. Fischer, N. O. Renno, **L. K. Tamppari**, A. Zent, and A.-M. Harri, 2020. Humidity observations and column simulations for a warm period at the Mars Phoenix lander site: constraining the adsorptive properties of regolith, *Icarus*, in press.
- Stack, K. + 66 co-authors, including **L. K. Tamppari**, 2020. Photogeologic Map of the Perseverance Rover Field Site in Jezero Crater Constructed by the Mars 2020 Science Team, *Space Sci Rev* (2020) 216:127, DOI: 10.1007/s11214-020-00739-x.
- Fischer, E., Martinez, G. M., Rennó, N. O., **Tamppari, L. K.**, & Zent, A. P. (2019). Relative humidity on Mars: New results from the Phoenix TECP sensor. *Journal of Geophysical Research: Planets*, 124. <https://doi.org/10.1029/2019JE006080>
- Pankine, A. A. and **L. K. Tamppari**, 2019. MGS TES observations of the water vapor in the Martian southern polar atmosphere during spring and summer, *Icarus*, doi.org/10.1016/j.icarus.2019.05.010.
- Miller, N., M. de la Torre-Juárez, **L. K. Tamppari**, 2018. The Effect of Bagnold Dunes Slopes on the Short Timescale Air Temperature Fluctuations at Gale Crater on Mars, *Geophys. Res. Lett.*, 45 (21), pp. 11588-11594.
- Read, W. G., **L. K. Tamppari**, N. J. Livesey, R. T. Clancy, F. Forget, P. Hartogh, S. C. R. Rafkin, G. Chattopadhyay, 2018. Retrieval of wind, temperature, water vapor and other trace constituents in the Martian atmosphere, *Plan. and Sp. Sci.*, doi.org/10.1016/j.pss.2018.05.004.

- Pankine, A. A. and **L. K. Tamppari**, 2019. MGS TES observations of the water vapor in the Martian southern polar atmosphere during spring and summer, *Icarus*, **331**, DOI: 10.1016/j.icarus.2019.05.010
- Farnocchia, D., S. Chesley, M. Micheli, A. Delamere, R.S. Heyd, D.J. Tholen, J. D. Giorgini, W.M. Owen, and **L.K. Tamppari**, 2016. High precision comet trajectory estimates: The Mars flyby of C/2013 A1 (Siding Spring), *Icarus*, **266**, pp. 279-287, DOI: 10.1016/j.icarus.2015.10.035
- Bridges, N.T., and **L.K. Tamppari**, 2015. Dynamic Mars from long-term observations: Introduction, *Icarus* **251**, pp. 1-4.
- Pankine, A.A., and **L.K. Tamppari**, 2015. Constraints on water vapor vertical distribution at the Phoenix landing site during summer from MGS TES day and night observations, *Icarus* **252**, pp. 107-120.
- Pankine, A. A., **L.K. Tamppari**, J. L. Bandfield, T. H. McConnochie, M. D. Smith, 2013. Retrievals of martian atmospheric opacities from MGS TES nighttime data, *Icarus*, **226**(1), pp. 708-722, doi:10.1016/j.icarus.2013.06.024.
- Clifford, S. M., et al., 2013. Introduction to the fifth Mars Polar Science special issue: Key questions, needs and recommended investigations, pp. 864-868, *Icarus*, **225** (2).
- Hale, A. S., **L. K. Tamppari**, D. S. Bass, M. D. Smith, 2010. Martian Water-ice clouds: A view from MGS-TES, *J. Geophys. Res.*, **116**, E04004, doi:10.1029/2009JE003449
- Pankine, A., **L. K. Tamppari**, M. D. Smith, 2010. MGS TES observations of the water vapor above the seasonal and perennial ice caps during northern spring and summer, *Icarus* **210**, 58–71, doi:10.1016/j.icarus.2010.06.043.
- Kounaves, S. P., S. T. Stroble, R. M. Anderson, Q. Moore, D. C. Catling, S. Douglas, C. P. McKay, D. W. Ming, P. H. Smith, **L. K. Tamppari**, and A. P. Zent, 2010. Discovery of Natural Perchlorate in the Antarctic Dry Valleys and its Global Implications, *Environ. Sci. Technol.*, **44**, pp. 2360-2364.
- Ellehoj, M. D., H. P. Gunnlaugsson, K.M. Bean, B. A. Cantor, L. Drube, D. Fisher, B.T.Gheynani, A-M. Harri, C. Holstein-Rathlou, H. Kahanpää, M.T. Lemmon, M.B. Madsen, M. C. Malin, J. Polkko, P. Smith, **L.K. Tamppari**, P.A.Taylor, W. Weng and J. Whiteway, 2009. Convective vortices and Dust Devils at the Phoenix Mars mission landing site, *J. Geophys. Res.* **115** (E00E16), doi:10.1029/2009JE003413.
- C. Holstein-Rathlou, H. P. Gunnlaugsson, J. P. Merrison, K. M. Bean, B. A. Cantor, J. A. Davis, R. Davy, N. B. Drake, M. D. Ellehoj, W. Goetz, S. F. Hviid, C. F. Lange, S. E. Larsen, M. Lemmon, M. B. Madsen, M. Malin, J. E. Moores, P. Nørnberg, P. Smith, **L. Tamppari**, P. A. Taylor, 2009. Winds at the Phoenix Landing Site, *J. Geophys. Res.*, **115** (E00E18), doi: 10.1029/2009JE003411.
- Ming, D. W., et al., 2009. Mars 2007 Phoenix Scout mission Organic Free Blank: Method to distinguish Mars organics from terrestrial organics, *J. Geophys. Res.*, **113** (E00A21), doi:10.1029/2007JE003061.
- Pankine, A., **L. K. Tamppari**, M. D. Smith, 2009. Water vapor variability in the North Polar Region on Mars from Viking MAWD and MGS TES datasets, *Icarus*, **204**, pp. 87-102.
- Smith, P. H., **L. K. Tamppari**, R.E. Arvidson, D. Bass, D. Blaney, W.V. Boynton, A. Carswell, D.C. Catling, B.C. Clark, T. Duck, E. DeJong, D. Fisher, W. Goetz, H.P. Gunnlaugsson, M.H. Hecht, V. Hipkin, J. Hoffman, S.F. Hviid, H.U. Keller, S.P. Kounaves, C.F. Lange, M.T. Lemmon, M.B. Madsen, W.J. Markiewicz, J. Marshall, C.P. McKay, M.T. Mellon, D.W. Ming, R.V. Morris, N. Renno, W.T. Pike, U. Staufer, C. Stoker, P. Taylor, J.A. Whiteway, A.P. Zent, 2009. H₂O at the Phoenix landing site, *Science*, **325** (5936), pp. 58-61.

- Whiteway, J. A., L. Komguem, C. Dickinson, C. Cook, M. Illnicki, J. Seabrook, V. Popovici, T. J. Duck, R. Davy, P. A. Taylor, J. Pathak, D. Fisher, A. I. Carswell, M. Daly, V. Hipkin, A. P. Zent, T. L. Hudson, **L. Tamppari**, N. Renno, J. Moores, M. T. Lemmon, F. Daerden, P. H. Smith, 2009. Mars water ice clouds and precipitation, *Science*, 325 (5936), pp. 68-70.
- Arvidson, R. et al., 2008. Mars Exploration Program 2007 Phoenix landing site selection and characteristics, *J. Geophys. Res.*, 113 (E00A03), doi: 10.1029/2007JE003021.
- Pathak, J., D. V. Michelangeli, L. Komguem, J. Whiteway, **L. K. Tamppari**, 2008. Simulating Martian boundary layer water ice clouds and the lidar measurements for the Phoenix mission, *J. Geophys. Res.*, 113 (E00A05), doi: 10.1029/2007JE002967.
- Plemmons, D. H., et al., 2008. Effects of the Phoenix Lander descent thruster plume on the Martian surface, *J. Geophys. Res.*, 113 (E003059), doi: 10.1029/2007JE003059.
- Smith, P. H., **L. K. Tamppari**, et al., 2008. Introduction to special section on the Phoenix Mission: Landing Site Characterization Experiments, Mission Overviews, and Expected Science, *J. Geophys. Res.*, 113 (E00A18), doi:10.1029/2007JE003083.
- Golombek, M. P., et al. (2008), Size-frequency distributions of rocks on the northern plains of Mars with special reference to Phoenix landing surfaces, *J. Geophys. Res.*, 113, E00A09, doi:10.1029/2007JE003065.
- Tsuyuki, G., **L. Tamppari**, T. Martin, and J. Murphy, 2007. "Development of the Surface Thermal Environment for the Mars Scout Phoenix Mission," Paper Number 2007-01-3239, Proceedings of the International Conference on Environmental Systems, Society of Automotive Engineers, Chicago, IL, dated July 2007.
- Drake, N. B., **L. K. Tamppari**, R. D. Baker, B. A. Cantor, and A. S. Hale, 2006. Dust devil tracks and wind streaks in the North Polar Region of Mars: A study of the 2007 Phoenix Mars Lander Sites, *Geophys. Res. Lett.*, 33, L19S02, doi: 10.1029/2006GL026270.
- Hale, A. Snyder, Bass, D.S., **Tamppari, L.K.** 2005. Monitoring the perennial martian northern polar cap with MGS MOC. *Icarus*, **174**, pp. 502-512.
- Rathbun, J. A., J. R. Spencer, **L. K. Tamppari**, T. Z. Martin, L. Barnard, and L. D. Travis, 2004. Mapping of Io's thermal radiation by the Galileo photopolarimeter-radiometer (PPR) instrument, *Icarus* V. 169, No. 1, pp. 127-139.
- D. W. Beaty, S. Miller, W. Zimmerman, J. Bada, P. Conrad, E. Dupuis, T. Huntsberger, R. Ivlev, S. S. Kim, B. G. Lee, D. Lindstrom, L. Lorenzoni, P. Mahaffy, K. McNamara, D. Papanastassiou, S. Patrick, S. Peters, N. Rohatgi, J. J. Simmonds, J. Spray, T. D. Swindle, **L. Tamppari**, A. Treiman, J. K. Wolfenbarger and A. Zent, 2004, Planning for a Mars in situ sample preparation and distribution (SPAD) system: *Planetary and Space Science*, v. 52, p. 55-66.
- Cooper, J. F., C. B. Phillips, J. R. Green, X. Wu, R. W. Carlson, **L. K. Tamppari**, R. J., Terrile, R. E. Johnson, J. H. Eraker, N. C. Makris, 2002. Europa Exploration: Science and Mission Priorities, The Future of Solar System Exploration, 2003-2013, ASP Conference Series, Vol. 272, pp. 217-252.
- Spencer, J. R., J. A. Rathbun, L. D. Travis, **L. K. Tamppari**, L. Barnard, and T. Z. Martin, 2000. High-resolution observations of Io's thermal emission from the Galileo photopolarimeter-radiometer, *Science*, **288**, pp. 1198-1201.
- Spencer, J. R., **L. K. Tamppari**, T. Z. Martin, L. D. Travis, 1999. Temperatures on Europa from Galileo PPR: Nighttime Thermal Anomalies, *Science*, **284**, p. 1514-1516.

- Orton, G. S., J. R. Spencer, L. D. Travis, T. Z. Martin, **L. K. Tamppari**, 1996. Galileo photopolarimeter-radiometer observations of Jupiter and the Galilean satellites, *Science*, 284 (5286): 389-391.
- Martin, T. Z., G. Orton, L. Travis, **L. Tamppari**, I. Claypool, 1995. Observation of Shoemaker-Levy Impacts by the Galileo Photopolarimeter Radiometer, *Science* **268**, p. 1875-79.