

Stefano Nerozzi

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Research work and interests:

I am the Science PI on a selected NASA Mars Data Analysis Program proposal to study the fluvial and volcanic history of outflow channel systems in Utopia Planitia, Mars. This project integrates several remote sensing techniques to unravel the history of landforms shaped by ancient water flows and interactions between volcanic processes and ground ice.

My doctoral research focused on constraining which driving forces and surface processes are responsible for the initial emplacement of the north polar cap of Mars in the Late Amazonian. This work included stratigraphy and morphology mapping via orbital radar and high-resolution imagery, and climate modeling with general circulation models.

My other interests include the design and construction of electronic measurement devices for geophysical application on field sites, such as ground temperature profilers and 3D seismometers for seismic tremor studies.

Education:

Ph.D. Geological Sciences

Aug 2014 – Aug 2019

University of Texas at Austin, TX, USA. Advisor: Dr. John Holt

GPA: 4.00/4.00

M.Sc. Geology and Land Management

Oct 2011 – Mar 2014

University of Bologna, Italy. Advisors: Dr. John Holt, Dr. Alessandro Amorosi

GPA: 3.93/4.00, Final grade: 110/110 cum laude

B.S. Geological Sciences

Oct 2008 – Oct 2011

University of Bologna, Italy. Advisor: Dr. Francesco Mulargia

GPA: 3.89/4.00, Final grade: 110/110 cum laude

Research funding:

Science PI

2019 – 2022

Investigating Magma-Cryosphere Interactions and Outflow Channel Activity in Hebrus Valles, NASA Mars Data Analysis Program (MDAP), \$384,783.

Academic and research work experience:

Graduate Research Assistant, Institute for Geophysics

Sep 2015 – Aug 2019

Analysis of orbital radar sounding profiles (SHARAD), high-resolution imagery (HiRISE, CTX) and global circulation models (LMD GCM) to reveal the recent history of Planum Boreum on Mars (PhD project).

Teaching Assistant, Jackson School of Geosciences Sep 2016 – May 2017
GEO303 – Intro to Geology – Fall 2016: Taught 3 weekly lab sessions of 2 hours each to a total of 50 non-geoscience-major students, administered quizzes and midterm exams, graded homework.

GEO325J & GEO391 – Intro to Geoscience Computation – Spring 2017: Assisted undergraduate and graduate students during Matlab lab sessions, graded homework.

Lab Assistant I, Institute for Geophysics Jun 2013 – Nov 2013
Analysis of orbital radar sounding profiles (SHARAD) to reveal the early evolution of the North Polar Layered Deposits on Mars (M.Sc. project).

Undergraduate Research Assistant, Institute for Geophysics Sep 2012 – May 2013
Analysis of orbital radar sounding profiles (SHARAD) to reveal the early evolution of the North Polar Layered Deposits on Mars (M.Sc. project).

Publications:

Nerozzi, S., and Holt, J.W., *in prep.*, The basal unit morphological and stratigraphic record of polar processes in Planum Boreum.

Ojha, L., **Nerozzi, S.**, and Lewis, K., 2019, Compositional Constraints on the North Polar Cap of Mars from Gravity and Topography: Geophysical Research Letters, doi:10.1029/2019GL082294.

Nerozzi, S., and Holt, J.W., 2019, Buried ice and sand caps at the north pole of Mars: revealing a record of climate change in the cavi unit with SHARAD: Geophysical Research Letters, doi:10.1029/2019GL082114.

Nerozzi, S., and Holt, J.W., 2018, Earliest Accumulation History of the North Polar Layered Deposits, Mars from SHARAD, Icarus. doi:10.1016/j.icarus.2017.05.027

Guallini, L., and **Nerozzi, S.**, 2014, Polar Layered Deposits, *in* Encyclopedia of Planetary Landforms, Springer New York, p. 1–14.

Oral Presentations:

Nerozzi, S., Holt, J.W., Forget, F., Spiga, A., Millour, E., 2019, Reconstructing the Climate-Driven Evolution of Planum Boreum with Sounding Radar, Visible Imagery and General Circulation Models, *in* Ninth International Conference on Mars, Abstract #6433.

Nerozzi, S., Holt, 2019, Buried ice and sand caps at the north pole of Mars: revealing a record of climate change in the cavi unit with SHARAD, *in* IGS - International Symposium on Five Decades of Radioglaciology, Abstract #81A3036.

Nerozzi, S., Holt, J.W., Forget, F., Spiga, A., Millour, E., 2019, Combining Radar Sounding and General Circulation Models to Reveal the Initial Accumulation of the Martian North Polar Layered Deposits, *in* 50th Lunar and Planetary Science Conference, Abstract #2854.

Nerozzi, S., and Holt, J.W., 2018, Revealing the History of Polar Ice Caps within the Planum Boreum Cavi Unit with SHARAD, *in* 2018 Late Mars Workshop, LPI Contrib. 2088, #5008.

Nerozzi, S., and Holt, J.W., 2018, The Ice and Sand Caps at the North Pole of Mars: Discovering a “Lost” Record of Climate Changes, *in* 2018 Mars Workshop on Amazonian Climate, LPI Contrib. 2086, #4022.

Nerozzi, S., and Holt, J.W., 2018, Ice caps under sand caps under an ice cap: revealing a record of climate change on Mars with SHARAD, *in* 49th Lunar and Planetary Science Conference, Abstract #1075.

Nerozzi, S., and Holt, J.W., 2017, Newly Mapped Extent, Morphology, and Internal Stratigraphy of the Martian North Polar Cavi Unit, *in* 48th Lunar and Planetary Science Conference, Abstract # 1722.

Nerozzi, S., and Holt, J.W., 2016, Stratigraphic Reconstruction of the Cavi Unit-NPLD Transition with SHARAD, *in* The 6th International Conference on Mars Polar Science and Exploration, Abstract # 6080.

Nerozzi, S., and Holt, J.W., 2016, Reconstructing the Initial Emplacement of the North Polar Layered Deposits, Mars with SHARAD, *in* 47th Lunar and Planetary Science Conference, Abstract # 2265.

Nerozzi, S., and Holt, J.W., 2015, Stratigraphic Structures and Depositional Patterns of the Lowermost NPLD, Mars, from SHARAD Mapping, *in* 46th Lunar and Planetary Science Conference, Abstract # 1670.

Awards:

<i>Best Seminar – UTIG Brown Bag</i> , Institute for Geophysics, University of Texas at Austin	2019
<i>Mars Student Travel Grant</i> , Mars Exploration Program	Aug 2018
<i>Mars Student Travel Grant</i> , Mars Exploration Program	Apr 2018
<i>Graduate School Summer 2018 Fellowship</i> , University of Texas at Austin	2018
<i>Endowed Presidential Scholarship</i> , University of Texas at Austin	2017
<i>Global Research Fellowship</i> , University of Texas at Austin	2016
<i>Travel grant for 6th Mars Polar Science Conference</i> , European Geosciences Union (EGU)	2016
<i>Jackson School of Geosciences Entry Fellowship</i> , University of Texas at Austin	2014
<i>Outstanding Student Poster Award</i> , European Geosciences Union (EGU)	2014
<i>TASSEP scholarship</i> , University of Bologna	2012
<i>Certificate of Merit, Prof. Ivano Dionigi</i> , Chancellor of the University of Bologna	2012
<i>Certificate of Merit, Prof. Ivano Dionigi</i> , Chancellor of the University of Bologna	2010

Professional experience:

NASA Planetary Science Summer Seminar May 2019 – Aug 2019
End-to-end design of a mission to an interstellar object. Roles in the course: UV-VIS spectrometer instrument lead, Team X telecom chair, geology and geophysics science group member.

Mentorship:

Guided research project (GEO 371C) September 2016 – May 2017
Christopher Eason, research topic: *Geological mapping of the north polar basal unit on Mars.*

Honors B.S. thesis

December 2017 – May 2019

Michael Christoffersen, thesis title: *Applying a Mass Balance Approach to Constrain Ice Thickness of Hubbard Glacier.*

Undergraduate research

May 2019 – present

Maya Ortiz, research topic: *Orbital imaging data processing and geological mapping of the north polar basal unit on Mars.*

Outreach activities and relevant learning experiences:

AP Research Project Mentor

Oct 2016 – April 2017

AP Research project by H. Kansara at Carnegie Vanguard High School, Houston, TX. Research topic: *How Would Terraforming Mars Question Society's Morals according to the Utilitarian Approach?*

UT Science Olympiad Regional Tournament

Feb 2018

Prepared a test on Remote Sensing and Meteorology and served as a proctor for the regional tournament at UT Austin.

Science Communication Workshop

Feb 2019

Learning to overcome communication barriers, exploring different perspectives, identifying jargon, finding points of connection, optimizing short speeches, visualizing science, science in social media, STEMprov.

Leadership:

UT Amateur Radio Club - President

Jan 2018 – Apr 2019

Manage club activities and meetings, teach licensing classes, define club goals, recruiting, and treasury. Club member since Jan 2015, officer since Sep 2016.

Field experience & Internships:

Remote sensing and geomorphology of volcanic fields, aeolian dune fields and alluvial fans, NV & CA	2016
TDEM and GPR soundings on debris covered glacier, Absaroka Range, WY	2015
TDEM soundings on debris covered glacier, Wrangell-St. Elias Mtns., AK	2014
GPR and LIDAR surveys on debris covered glacier, Uinta Mtns., UT	2013
Carbonate sequence stratigraphy, Guadalupe Mtns., TX & NM	2013
ER, FDEM, GPR, and gravimetric surveys on karst area, Austin, TX	2012
Carbonate stratigraphy and geological mapping, Western Sicily, Italy	2012
Rock mechanics, stratigraphic logging and geological mapping, Central Alps, Italy	2011
Internship: Seabed bathymetry, navigation planning on research vessel Maria Grazia, Southern Adriatic Sea, Italy	2011
Stratigraphic logging and geological mapping, Central Alps, Italy	2010

Skills:**Research & Industry**

Geology (geological mapping, geomorphology, stratigraphy), geophysics and remote sensing (sounding radar, multispectral imaging, passive seismic techniques, time-domain EM, gravity, electrical resistivity), electronic circuit design, HF antenna design and construction.

Computer & Software

Linux and Windows operating systems, ArcGIS, Landmark DecisionSpace, JMARS, USGS ISIS3, NASA Ames Stereo Pipeline, LMD General Circulation Model, Matlab, Illustrator, Photoshop.

Professional

Visualization, analysis and interpretation of spatial datasets, delineation of scientific goals with holistic perspective, teamwork and collaboration, critical thinking, proposal writing, mentoring.

Languages:

English – professional proficiency

Italian – native