

Margaret E. Landis
Department of Planetary Sciences
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Education

University of Arizona, Tucson, AZ USA (current)
PhD candidate, Department of Planetary Sciences
M.S. Planetary Sciences, Fall 2015

Northern Arizona University, Flagstaff, AZ USA
B.S. Physics and Astronomy, 2013
Minors in Mathematics and Biology, with University Honors

Experience

Graduate Research Associate (June 2016-current)
Lunar and Planetary Laboratory, University of Arizona
Conducted research on projects towards a PhD dissertation, including mapping craters on the North and South Polar Layered Deposits of Mars using Java Mission-Planning and Analysis for Remote Sensing (JMARS) and ArcMap software, and developing MatLab-based thermal and ice stability models to explore the vapor production of water ice on Ceres.
Dissertation advisor: Shane Byrne

National Science Foundation Graduate Research Internship Program (May-August 2017)
United States Geologic Survey, Astrogeology Science Center
Worked on a crater catalog for the South Polar Layered Deposits, Mars using Context Camera (CTX) data and USGS Crater Helper Tools in ArcMap.
Internship advisors: Kenneth Herkenhoff and Colin Dundas

Graduate Teaching Assistant (August 2016-May 2016)
Lunar and Planetary Laboratory, University of Arizona

- PTYS170B2 "The Universe & Humanity: Origin & Destiny" (Fall 2015), for Dr. Kat Volk
- PTYS170A1 "Planet Earth: Evolution of the Habitable World" (Spring 2016), for Dr. Isamu Matsuyama

Graduate Research Assistant (August 2013-August 2015)
Lunar and Planetary Laboratory, University of Arizona
Conducted research on project towards a PhD dissertation, including work on the crater population and age of the North Polar Layered Deposits, Mars, using HiRISE image data and developed scripts in MatLab to analyze and present results.
Advisor: Shane Byrne

National Science Foundation Research Experience for Undergraduates (June-August 2012)

Harvard-Smithsonian Center for Astrophysics

Examined near-infrared and infrared photometry from the Wide-field Infrared Survey Explorer (WISE) telescope to characterize protoplanetary disks.

Internship advisor: Catherine Espaillat

Undergraduate Researcher (February 2011-May 2013)

Department of Physics and Astronomy, Northern Arizona University

Classified interior morphologies of impact craters in 0-20N, 0-30E of Arabia Terra, Mars using THEMIS and CTX data. Used ArcMap, Crater Helper Tools, and CraterStats to map and determine model ages of craters with similar interior features and morphologies.

Advisor: Nadine Barlow

Mission Participation

- High Resolution Imaging Science Experiment (HiRISE)
 - Graduate student, University of Arizona (2013-present)
- Dawn at Ceres
 - Guest Investigator Student (2015-present)

Publications

Landis, M.E., S. Byrne, N. Schörghofer, B.E. Schmidt, P.O. Hayne, J. Castillo-Rogez, M.V.

Sykes, J.-P. Combe, A. I. Ermakov, T.H. Prettyman, C. Raymond, C.T.

Russell (2017), Conditions for Sublimating Water Ice to Supply Ceres'

Exosphere, *Journal of Geophysical Research: Planets*, doi:10.1002/2017JE005335

Landis, M. E., S. Byrne, I. J. Daubar, K. E. Herkenhoff, and C. M. Dundas (2016), A revised surface age for the North Polar Layered Deposits of Mars, *Geophysical Research Letters* 43, 3060–3068, doi:10.1002/2016GL068434.

Ruesch, O., L.C. Quick, **M.E. Landis**, M.M. Sori, O. Čadek, P. Brož, K.A. Otto, M.T. Bland, S. Byrne, J.C. Castillo-Rogez, H. Hiesinger. (2018). Bright carbonate surfaces on Ceres as remnants of salt-rich water fountains. *Icarus*. doi: j.icarus.2018.01.022

Combe, J.-P., A. Raponi, F. Tosi, M.C. De Sanctis, F. G. Carrozzo, F. Zambon, E. Ammannito, K.H.G. Hughson, A. Nathues, M. Hoffman, T. Platz, G. Thangjam, N. Schorghofer, S. Schroder, S. Byrne, **M.E. Landis**, O. Ruesch, T.B. McCord, K.E. Johnson, S.M. Singh, C.A. Raymond, C.T. Russell (2017), Exposed H₂O-rich areas detected on Ceres with the Dawn Visible and InfraRed mapping spectrometer, *Icarus*, doi:10.1016/j.icarus.2017.12.008

Schorghofer, N., S. Byrne, **M.E. Landis**, E. Mazarico, T.H. Prettyman, B.E. Schmidt, M.N. Villarreal, J. Castillo-Rogez, C.A. Raymond, C.T. Russell (2017), The putative cerean exosphere, *Astrophysical Journal*, 85:1, doi: 10.3847/1538-4357/aa932f

Robbins, S.J., W.A. Watters, J.E. Chappelow, V.J. Bray, I.J. Daubar, R.A. Craddock, R.A. Beyer, **M.E. Landis**, L.R. Ostrach, L. Tornabene, J.D. Riggs, B.P. Weaver (2017), Measuring impact crater depth throughout the solar system, *Meteoritics and Planetary Science*, doi: 10.1111/maps.12956

Combe, J.-P., T.B. McCord, F. Tosi, E. Ammannito, F.G. Carrozzo, M.C. De Sanctis, A. Raponi, S. Byrne, **M.E. Landis**, K.H.G. Hughson, C.A. Raymond, C.T. Russell (2016), Detection

of local H₂O exposed at the surface of Ceres, *Science*, 353:6303,
doi:10.1126/science.aaf3010

- Platz, T., A. Nathues, N. Schorghofer, Frank Preusker, E. Mazarico, S. E. Schröder, S. Byrne, T. Kneissl, N. Schmedemann, J.-P. Combe, M. Schafer, G.S. Thangjam, M. Hoffman, P. Gutierrez-Marques, **M.E. Landis**, W. Dietrich, J. Ripken, K.-D. Matz, C. T. Russell (2016) Surface water-ice deposits in the northern shadowed regions of Ceres. *Nature Astronomy* 1 (2016): 0007.
- Sori, M.M., J. Bapst, A. Bramson, S. Byrne, **M.E. Landis** (2017). A Wunda-full world? Carbon dioxide ice deposits on Umbriel and other Uranian moons, *Icarus*, doi: 10.1016/j.icarus.2017.02.029
- Sori, M. M., S. Byrne, C. W. Hamilton, and **M. E. Landis** (2016), Viscous flow rates of icy topography on the north polar layered deposits of Mars, *Geophys. Res. Lett.*, 43, 541–549, doi:10.1002/2015GL067298.

Workshops and Summer Schools

- Alan Alda Center for Communicating Science Workshop, 6-7 February 2018
- Short Course and Field School at the Sudbury Impact Structure, 23-30 September 2017
- Workshop on the Theoretical and Laboratory Studies of Icy Regoliths, 5-7 September 2017
- Keck Institute for Space Studies “Unlocking the Climate Record Stored within Mars’ Polar Layered Deposits” workshop participant, August 2017
- Planetary Science Summer School, Jet Propulsion Laboratory, Summer 2016
 - Shadowed the Team X risk chair, served as spacecraft camera team lead and moons/geology science theme participant for a Uranus orbiter mission concept study
- Workshop on Issues in Crater Studies and the Dating of Planetary Surfaces, May 2015
- NAIF SPICE training workshop, October 2014

Fellowships, Awards, Scholarships

- NSF Graduate Research Fellowship (Fall 2014-present)
 - 2017 Graduate Research Internship Program award to develop a South Polar Layered Deposits crater catalog at the US Geological Survey (advisors: Kenneth Herkenhoff, Colin Dundas)
- Lunar and Planetary Institute Career Development Award for travel to the Lunar and Planetary Science Conference (March 2018)
- University of Arizona Graduate and Professional Student Council Travel grant for attendance at the Workshop on Theoretical and Laboratory Studies of Icy Regoliths
- Outstanding Service and Outreach award, Department of Planetary Sciences/Lunar and Planetary Laboratory (Spring 2017)
- Best Graduate Student Talk, Lunar and Planetary Laboratory Conference (Fall 2016)
- Mars Exploration Program Student Travel Grant, for attendance at the 6th International Conference on Mars Polar Science and Exploration (Summer 2016)
- Curson Travel Award (Spring 2016)
- Galileo Circle Scholar (Spring 2015, Spring 2017)
- Mars Exploration Program Student Travel Grant, for attendance at the Workshop on Issues in Crater Studies and the Dating of Planetary Surfaces (Spring 2015)
- Tom and Rose Bedwell Astronomy Scholarship (Spring 2013)

- Honors Academic Achievement Award (Spring 2013)
- Slipper Scholar (Junior and Senior, 2011 and 2012)
- American Association of University Women Certificate of Excellence for Achievement in Science (2008)

Department Service

- LPL Library Committee graduate student representative (2014-present)
- LPL Computer Committee graduate student representative (2014-2017)
- LPL Conference planning committee (2014-2017)

Community Service

- Executive secretary for a NASA ROSES proposal review panel
- Served as a peer reviewer for papers in *Icarus* and *Journal of Geophysical Research: Planets*

Teaching

Graduate Teaching Assistant (August 2015-May 2016)

PTYS170B2 "The Universe & Humanity: Origin & Destiny" (Fall 2015), for Dr. Kat Volk

PTYS170A1 "Planet Earth: Evolution of the Habitable World" (Spring 2016), for Dr. Isamu

Matsuyama

Lunar and Planetary Laboratory/Dept. Planetary Sciences

AST 180L Teaching Assistant (January-May 2012)

Department of Physics and Astronomy

Northern Arizona University

Grader

PHY331 "Electricity and Magnetism I" (January-May 2013)

AST391 "Astrophysics: Stars" (August-December 2012)

Department of Physics and Astronomy

Northern Arizona University

Outreach

- *Washington Aerospace Scholars Virtual Mentor Program* (January 2016—present)
 - Mentored ~5 students per academic year during an online space/planetary science course for high school juniors
- *Space Drafts/Astronomy on Tap Tucson, Tucson, AZ*
 - ~30 minute public talk at Borderlands Brewery, on Mars polar research
- *American Astronomical Society "Astronomy Ambassador"*
 - Completed training at the November 2014 DPS meeting, Tucson, AZ
- *Northern Arizona University Astronomy Club, Flagstaff, AZ*
 - Member (Fall 2009-Spring 2013), President (Spring 2013), Treasurer (Spring 2010-Spring 2011)
 - Certified Telescope Operator (Fall 2009-Spring 2013)--weekly public nights at the 0.5m Barry Lutz Telescope for Education and Training
- *Spark Museum of Electrical Invention, Bellingham, WA* (Summer 2013)
 - Volunteer docent and educator

- *Tucson Festival of Books, Tucson, AZ* (March 2014, March 2015, March 2016)
 - Volunteer, Science City
- *Pima Air and Space Museum, Tucson, AZ* (Summer 2014, Summer 2015)
 - Volunteer for NightWings program
- *Art of Planetary Science, Tucson, AZ* (October-December 2013, October 2014, February 2017)
 - Submitted photographs, helped with set-up and night-of duties