

CATHERINE M. ELDER

Jet Propulsion Laboratory
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Pasadena, CA 91109
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EDUCATION

- 2015 **Ph.D. Planetary Sciences (Minor in Geosciences)**
University of Arizona
Dissertation Title: *The Effects of Melt on Impact Craters on Icy Satellites and on the Dynamics of Io's Interior*
- 2008 **B.A. Astronomy**
Cornell University

RESEARCH EXPERIENCE

- 2018–Present **Research Scientist**
Planetary Interiors and Geophysics Group
Jet Propulsion Laboratory
- 2015–2018 **Postdoctoral Scholar**
Geophysics & Planetary Geosciences Group
Jet Propulsion Laboratory
- 2009–2015 **Graduate Research Associate**
Department of Planetary Sciences/Lunar and Planetary Laboratory
University of Arizona
- Summer
2006 **Student Undergraduate Internship in Astrobiology (SUIA)**
NASA Goddard Space Flight Center
- 2005–2008 **Undergraduate Research Assistant**
Department of Astronomy
Cornell University

MISSION EXPERIENCE

Europa Clipper

- Investigation Scientist for the Europa Imaging System (EIS) (2019–Present)

Canadian Lunar Rover Mission

- Lunar Advanced Filter Observing Radiometer for Geologic Exploration (LAFORGE) Co-I (2021–Present)

Lunar Reconnaissance Orbiter (LRO)

- Diviner Lunar Radiometer Experiment Co-I (2018–Present), Postdoc (2015–2018)
- LRO Extended Science Mission 5 proposal theme lead for Regolith and Impacts section (2021-2022)
- Targeting and analyzing nighttime temperature observations to derive thermophysical properties and better understand the material properties of the lunar surface.

Newly-formed Impact Crater & Coldspot Explorer (NICCE)

- Payloads and Research Investigations on the Surface of the Moon (PRISM) proposal (not selected) Collaborator (2022-2023)

Science Investigation for Lithology and Igneous Composition Analysis (SILICA)

- Payloads and Research Investigations on the Surface of the Moon (PRISM) proposal (not selected) Co-I (2021-2022)

Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-REx)

- Participating Scientist (2017–2020)
- Member of the Thermal Analysis and Regolith Development Working Groups

Intrepid Pre-Decadal Mission Concept Study

- JPL science liaison (2019–2020)

Moon Diver (NASA Discovery proposal)

- Deputy Camera Scientist and regolith theme team member (2018–2019)
- Assisted in the development of the science traceability matrix, acted as a local science resource to the JPL engineering team, participated in the costing of the context cameras, and contributed to preliminary landing site safety assessment.

JPL Planetary Science Summer School (2016)

- Principal Investigator
- Developed a mission concept for a Uranus orbiter.

HONORS AND AWARDS

2023	JPL Team Award
2020	JPL Team Award
2018	JPL Voyager Award
2016	JPL Postdoc Research Day Best Planetary Science and Life Detection Poster
2014	American Geophysical Union (AGU) Outstanding Student Paper Award
2014	Uwingu Student Travel Grant
2014	Hartmann Student Travel Award
2013	Lunar and Planetary Institute (LPI)'s Career Development Award
2013	Lunar and Planetary Laboratory (LPL)'s Shandel Travel Award
2012, 2013	University of Arizona Graduate Student Council Travel Grant
2007	NSF Research Experience for Undergraduates
2004–2006	Cornell University Dean's List

INVITED TALKS

2022	University of California, Santa Cruz Other Worlds Laboratory Planetary Lunch Seminar
2021	Geological Society of America Annual Meeting
2019	Geological Society of America Annual Meeting
2018	Geological Society of America Annual Meeting
2016	American Geophysical Union Fall Meeting
2015	University of California Los Angeles iPLEX seminar
2015	Southwest Research Institute Colloquium

TEACHING AND ADVISING EXPERIENCE

2017–Present	Research advisor <i>Jet Propulsion Laboratory</i>
<u>Postdocs:</u>	
2023–Present	Andrew Wilcoski
2022–Present	Austin Green
2020–2023	Benjamin Byron

Undergraduates:

2020–2022 Ashley Rincon (Palomar Community College 2021, UC Berkeley 2023)
Summer 2021 Emma Cooper (Pitzer College 2022, now at Sandia National Laboratories)
Summers Benjamin Douglass (University of Colorado, Boulder 2022, now a graduate student at Arizona State University)
2018–2021
Fall 2019 Ferdaws Rashid (Glendale Community College)
2017–2019 Jose Martinez-Camacho (Cal Poly Pomona 2019, now a graduate student at Southern Methodist University)
Summer 2018 Sophie Taylor (UCLA 2020)
Summer 2017 James Haber, co-advised with Paul Hayne (Cornell University 2018, now a postdoc at Smithsonian)

High school:

2019–2021 Sam Orientale (Briarcliff High School 2021, now an undergrad at Dartmouth)

2008–2014 **Graduate Teaching Associate**
(9 semesters) *University of Arizona*
Planet Earth: Evolution of a Habitable World (Spring 2013, Fall 2013)
Golden Age of Planetary Exploration (Spring 2012)
Astrobiology: A Planetary Perspective (Fall 2011, Fall 2012, Fall 2014)
The Universe and Humanity: Origin and Destiny (Fall 2008, Spring 2009, Spring 2014)

2009 **Relevant Coursework**
University of Arizona
Student in ‘Teaching College-Level Astronomy and Planetary Science’.
Taught by: Gina Brissenden and Edward Prather.

2006–2008 **Physics Tutor**
Cornell University
Held office hours in the tutoring center, which was open to all students in three different levels of introductory physics classes.

RESEARCH GRANTS

- 2021–2023 **Co-I**, PI: Matt Kenyon, “Next-generation cold object radiometer”, NASA Maturation of Instruments for Solar System Exploration.
- 2019–2022 **PI**, “The Lunar Rock Size-Frequency Distribution and Implications for Rock Breakdown”, NASA Lunar Data Analysis Program.
- 2019–2022 **PI**, “Mapping the Thickness of the Lunar Regolith Using a New Class of Young Craters”, NASA Lunar Data Analysis Program.
- 2017–2020 **PI**, “Boulders on Bennu: Modeling Thermal Emission from Boulders for Yarkovsky Effect and Thermal Inertia Investigations”, NASA OSIRIS-REx Participating Scientist Program.
- 2017–2020 **Science-PI**, PI: Michael Bland, “Silicate Volcanism and the Habitability of Europa’s Seafloor”, NASA Habitable Worlds.
- 2010–2013 Graduate student, Advisor/PI: Adam Showman, “The Coupled Orbital and Thermal Evolution of Io”, NASA Earth and Space Science graduate student Fellowship (NESSF).

PROFESSIONAL SERVICE

NASA Review Panel Group Chief, Panelist, External Reviewer, and/or Executive Secretary for the following programs: Planetary Data Archiving, Restoration, and Tools; Lunar Data Analysis Program; Mars Data Analysis Program; Discovery Data Analysis Program; New Frontiers Data Analysis Program; Solar System Workings; NASA Earth and Space Science Fellowship; PICASSO

Journal referee: *Geophysical Research Letters*, *Icarus*, *Journal of Geophysical Research – Planets*, *IEEE Transactions on Geoscience and Remote Sensing*

Outer Planet Assessment Group (OPAG) Steering Committee Member, 2024-Present

DPS Science Organizing Committee, 2024

Co-convener Ice Giant session at EGU, 2024

Network for Ocean Worlds (NOW) Steering Committee Member, 2023-Present

Science Organizing Committee - Uranus Flagship: Investigations and Instruments for Cross-Discipline Science Workshop, 2023

Roadmap to Ocean Worlds (ROW) team member

Judge of presentations: American Geophysical Union, Outstanding Student Paper Awards, Lunar and Planetary Science Conference, Dwornik Award, JPL postdoc Research Day Poster Session

University of Arizona Graduate Student Council Travel Grant Reviewer

Graduate Student Representative to the Department of Planetary Sciences Faculty, 2011–2012

Co-Organizer of the Lunar and Planetary Laboratory Conference, 2011, 2012

PROFESSIONAL MEMBERSHIPS

Geologic Society of America

American Astronomical Society, Division of Planetary Sciences

American Geophysical Union

OUTREACH

2023	Volunteer at Europa Clipper Outreach event, San Juan PR
2021, 2023	Europa Clipper Here to Observe (H2O) mentor
2018, 2023	Explore JPL Europa exhibit volunteer
2018	Lunar Reconnaissance Orbiter Reddit ‘Ask Me Anything’
2014	Science Fair judge at Fruchthendler Elementary School, Tucson, AZ
2013, 2014	Volunteer at the ‘Science City’ section of the Tucson Festival of Books
2012	Volunteer at the Arizona Science and Astronomy Expo
Summer 2003	Weekly volunteer at the Boston Museum of Science

PEER-REVIEWED PUBLICATIONS

(*Postdoc supervised, Student supervised)

Kumari N, Glotch TD, Williams J-P, Sullivan MT, Li S, Greenhagen BT, Waller D, Powell T, **Elder CM**, *Byron BD, Shirley KA. (2024) Extended Silicic Volcanism in the Gruithuisen Region—Revisiting the Composition and Thermophysical Properties of Gruithuisen Domes on the Moon. *The Planetary Science Journal*. 5(6):132. DOI: 10.3847/PSJ/ad4352

Pappalardo, Robert T., Bonnie J. Buratti, Haje Korth, David A. Senske, Diana L. Blaney, Donald D. Blankenship, James L. Burch, Philip R. Christensen, Sascha Kempf, Margaret G. Kivelson, Erwan Mazarico, Kurt D. Retherford, Elizabeth P. Turtle, Joseph H. Westlake, Brian G. Paczkowski, Trina L. Ray, Jennifer Kampmeier, Kate L. Craft, Samuel M. Howell, Rachel L. Klima, Erin J. Leonard, Alexandra Matiella Novak, Cynthia B. Phillips, Ingrid J. Daubar, Jordana Blacksberg, Shawn M. Brooks, Mathieu N. Choukroun, Corey J. Cochran, Serina Diniega, **Catherine M. Elder**, Carolyn M. Ernst, Murthy S. Gudipati, Adrienn Luspay-Kuti, Sylvain Piqueux, Abigail M. Rymer, James H. Roberts, Gregor Steinbrügge, Morgan L. Cable, Jennifer E. C. Scully, Julie C. Castillo-Rogez, Hamish C. F. C. Hay, Divya M. Persaud, Christopher R. Glein, William B. McKinnon, Jeffrey M. Moore, Carol A. Raymond, Dustin M. Schroeder, Steven D. Vance, Danielle Y. Wyrick, Mikhail Y. Zolotov, Kevin P. Hand, Francis Nimmo, Melissa A. McGrath, John R. Spencer, Jonathan I. Lunine, Carol S. Paty, Jason M. Soderblom, Geoffrey C. Collins, Britney E. Schmidt, Julie A. Rathbun, Everett L. Shock, Tracy C. Becker, Alexander G.

Hayes, Louise M. Prockter, Benjamin P. Weiss, Charles A. Hibbitts, Alina Moussessian, Timothy G. Brockwell, Hsiang-Wen Hsu, Xianzhe Jia, G. Randall Gladstone, Alfred S. McEwen, G. Wesley Patterson, Ralph L. McNutt Jr., Jordan P. Evans, Timothy W. Larson, L. Alberto Cinghuala, Glen G. Havens, Brent B. Buffington, Ben Bradley, Stefano Campagnola, Sean H. Hardman, Jeffrey M. Srinivasan, Kendra L. Short, Thomas C. Jedrey, Joshua A. St. Vaughn, Kevin P. Clark, Janet Vertesi & Curt Niebur (2024). Science Overview of the Europa Clipper Mission. *Space Science Reviews*, 220(4), 1-58. DOI: 10.1007/s11214-024-01070-5

Ryan, Andrew J., Benjamin Rozitis, Daniel Pino Munoz, Kris J. Becker, Joshua P. Emery, Michael C. Nolan, Marc Bernacki, Marco Delbo, **Catherine M. Elder**, Matthew Siegler, Erica R. Jawin, Dathon R. Golish, Kevin J. Walsh, Christopher W. Haberle, Carina A. Bennett, Kenneth L. Edmundson, Victoria E. Hamilton, Phillip R. Christensen, Michael G. Daly and Dante S. Lauretta (2024) Rocks with Extremely Low Thermal Inertia at the OSIRIS-REx Sample Site on Asteroid Bennu. *The Planetary Science Journal* 5:92. DOI 10.3847/PSJ/ad2dff

Nypaver, Cole, Thomas Watters , Bradley Thomson , Ali Bramson , Joshua Cahill , Jacklyn Clark , **Catherine Elder**, Caleb Fassett , Gareth Morgan , Santa Lucía Pérez Cortés , and Tyler Powell (2024) Lunar Boulder Fields as Indicators of Recent Tectonic Activity. *The Planetary Science Journal* 5:77. <https://doi.org/10.3847/PSJ/ad28b6>

I. J. Daubar, A. G. Hayes, G. C. Collins, K. L. Craft, J. A. Rathbun, J. R. Spencer, D. Y. Wyrick, M. T. Bland, A. G. Davies, C. M. Ernst, S. M. Howell, E. J. Leonard, A. S. McEwen, J. M. Moore, C. B. Phillips, L. M. Prockter, L. C. Quick, J. E. C. Scully, J. M. Soderblom, S. M. Brooks, M. Cable, M. E. Cameron, K. Chan, C. J. Chivers, M. Choukroun, C. J. Cochrane, S. Diniega, A. J. Dombard, **C. M. Elder**, C. Gerekos, C. Glein, T. K. Greathouse, C. Grima, M. S. Gudipati, K. Hand, C. Hansen, P. Hayne, M. Hedman, K. Hughson, X. Jia, J. Lawrence, H. M. Meyer, K. Miller, R. Parekh, G. W. Patterson, D. M. Persaud, S. Piqueux, K. D. Retherford, K. M. Scanlan, P. Schenk, B. Schmidt, D. Schroeder, G. Steinbrügge, A. Stern, G. Tobie, P. Withers, D. A. Young, B. Buratti, H. Korth, D. Senske, R. Pappalardo (2024) Planned Geological Investigations of the Europa Clipper Mission. *Space Science Reviews*, 220, 18. <https://doi.org/10.1007/s11214-023-01036-z>

Catherine M. Elder, Rebecca R. Ghent, James Haber, Paul O. Hayne, Gareth Morgan, Mark S. Robinson, Matt Siegler, and Jean-Pierre Williams (2023) The Variability of Lunar Mare Basalt Properties from Surface Rock Abundance. *The Planetary Science Journal* 4, 244. DOI 10.3847/PSJ/ad06a8

Erin J. Leonard, Chloe B. Beddingfield, **Catherine M. Elder** and Tom A. Nordheim (2023) Unraveling the Geologic History of Miranda's Inverness Corona. *The Planetary Science Journal* 4, 235. DOI 10.3847/PSJ/ad0552

Steven D. Vance, Kathleen L. Craft, Everett Shock, Britney E. Schmidt, Jonathan Lunine, Kevin P. Hand, William B. McKinnon, Elizabeth M. Spiers, Chase Chivers, Justin D. Lawrence, Natalie Wolfenbarger, Erin J. Leonard, Kirtland J. Robinson, Marshall J. Styczinski, Divya M. Persaud, Gregor Steinbrügge, Mikhail Y. Zolotov, Lynnae C.

Quick, Jennifer E. C. Scully, Tracy M. Becker, Samuel M. Howell, Roger N. Clark, Andrew J. Dombard, Christopher R. Glein, Olivier Mousis, Mark A. Sephton, Julie Castillo-Rogez, Francis Nimmo, Alfred S. McEwen, Murthy S. Gudipati, Insoo Jun, Xianzhe Jia, Frank Postberg, Krista M. Soderlund, **Catherine M. Elder** (2023). Investigating Europa's Habitability with the Europa Clipper. *Space Science Reviews*, 219, 81. <https://doi.org/10.1007/s11214-023-01025-2>

*Benjamin D Byron, **Catherine M. Elder**, Timothy D. Glotch, Paul O. Hayne, Lori M. Pigue, and Joshua T. S. Cahill (2023). Evidence for Fine-grained Material at Lunar Red Spots: Insights from Thermal Infrared and Radar Data Sets. *The Planetary Science Journal* 4, 182. DOI 10.3847/PSJ/acf134

Roberts, James, H., William B. McKinnon, **Catherine M. Elder**, Gabriel Tobie, John B. Biersteker, Duncan Young, Ryan S. Park, Gregor Steinbrügge, Francis Nimmo, Samuel M. Howell, Julie C. Castillo-Rogez, Morgan L. Cable, Jacob N. Abrahams, Michael T. Bland, Chase Chivers, Corey J. Cochrane, Andrew J. Dombard, Carolyn Ernst, Antonio Genova, Christopher Gerekos, Christopher Glein, Camilla D. Harris, Hamish C.F.C. Hay, Paul O. Hayne, Matthew Hedman, Hauke Hussmann, Xianzhe Jia, Krishan Khurana, Walter S. Kiefer, Randolph Kirk, Margaret Kivelson, Justin Lawrence, Erin J. Leonard, Jonathan I. Lunine, Erwan Mazarico, Thomas B. McCord, Alfred McEwen, Carol Paty, Lynnae C. Quick, Carol A. Raymond, Kurt D. Retherford, Lorenz Roth, Abigail Rymer, Joachim Saur, Kirk Scanlan, Dustin M. Schroeder, David A. Senske, Wencheng Shao, Krista Soderlund, Elizabeth Spiers, Marshall J. Styczinski, Paolo Tortora, Steven D. Vance, Michaela N. Villarreal, Benjamin P. Weiss, Joseph H. Westlake, Paul Withers, Natalie Wolfenbarger, Bonnie Burrati, Haje Korth, Robert T. Pappalardo, and the Interior Thematic Working Group (2023). Exploring the Interior of Europa with the Europa Clipper. *Space Science Reviews*, 219, 46. <https://doi.org/10.1007/s11214-023-00990-y>

Wilcoski, A. X., Hayne, P. O., **Elder, C. M.** (2023). Thermal environments and volatile stability within lunar pits and caves. *Journal of Geophysical Research: Planets*, 128, e2023JE007758. <https://doi.org/10.1029/2023JE007758>

*Byron, B. D., **Elder, C. M.**, Williams, J. P., Ghent, R. R., Gallinger, C. L., Hayne, P. O., and Paige, D. A. (2022). Thermophysical Properties of Lunar Irregular Mare Patches From LRO Diviner Radiometer Data. *Journal of Geophysical Research: Planets*, 127(7), e2022JE007214. doi:10.1029/2022JE007214

Beddingfield, C. B., Leonard, E., Cartwright, R. J., **Elder, C.**, and Nordheim, T. A. (2022). High Heat Flux near Miranda's Inverness Corona Consistent with a Geologically Recent Heating Event. *The Planetary Science Journal*, 3(7), 174. doi:10.3847/PSJ/ac7be5

Williams, J.-P., A. V. Pathare, E. S. Costello, C. L. Gallinger, P. O. Hayne, R. R. Ghent, D. A. Paige, M. A. Siegler, P. S. Russell, **C. M. Elder** (2022) The Effects of Terrain Properties upon the Small Crater Population Distribution at Giordano Bruno: Implications for Lunar Chronology. *Journal of Geophysical Research - Planets*, 127(5): e2021JE007131. doi:10.1029/2021JE007131

Bland, M.T. and **Elder, C.M.** (2022) Silicate Volcanism on Europa's Seafloor and Im-

plications for Habitability. *Geophysical Research Letters*, 49(5), p.e2021GL096939.

Cartwright, R.J., Nordheim, T.A., DeColibus, D.R., Grundy, W.M., Holler, B.J., Beddingfield, C.B., Sori, M.M., Lucas, M.P., **Elder, C.M.**, Regoli, L.H., Cruikshank, D.P., Emery, J. P., Leonard, E. J., Cochrane, C. J. (2022) A CO₂ Cycle on Ariel? Radiolytic Production and Migration to Low-latitude Cold Traps. *The Planetary Science Journal*, 3(1), p.8.

Trang, D., T. Tonkham, J. Filiberto, S. Li, M. Lemelin, and **C. M. Elder** (2022) Eruption characteristics of lunar localized pyroclastic deposits as evidenced by remotely sensed water, mineralogy, and regolith. *Icarus* 375, 114837.

Leonard, E.J., **Elder, C.**, Nordheim, T.A., Cartwright, R., Patthoff, D.A., Beddingfield, C., Cochrane, C., Brooks, S., Tiscareno, M., Strange, N. and Balint, T. (2021) UMaMI: A New Frontiers-style Mission Concept to Explore the Uranian System. *The Planetary Science Journal* 2, no. 5: 174.

Cartwright, Richard J., Beddingfield, Chloe B., Nordheim, Tom A., **Elder, Catherine M.**, Castillo-Rogez, Julie C., Neveu, Marc, Bramson, Ali M., Sori, Michael M., Buratti, Bonnie J., Pappalardo, Robert T., Roser, Joseph E., Cohen, Ian J., Leonard, Erin J., Ermakov, Anton I., Showalter, Mark R., Grundy, William M., Turtle, Elizabeth P., Hofstadter, Mark D. (2021) The science case for spacecraft exploration of the Uranian satellites: Candidate ocean worlds in an ice giant system. *Planetary Science Journal*, 2:120.

Burke, Keara N., DellaGiustina, Daniella N., Bennett, Carina A., Walsh, Kevin J., Pajola, Maurizio, Bierhaus, Edward B., Nolan, Michael C., Boynton, William V., Brodbeck, Juliette I., Connolly, Harold C., Jr., Prasanna Deshapriya, Jasinghege D., Dworkin, Jason P., **Elder, Catherine M.**, Golish, Dathon R., Hoover, Rachael H., Jawin, Erica R., McCoy, Timothy J., Michel, Patrick, Molaro, Jamie L., Nolau, Jennifer O., Padilla, Jacob, Rizk, Bashar, Robbins, Stuart J., Sahr, Eric M., Smith, Peter H., Stewart, Stephanie J., Susorney, Hannah C.M., Enos, Heather L., Lauretta, Dante S. (2021) Particle Size-Frequency Distributions of the OSIRIS-REx Candidate Sample Sites on Asteroid (101955) Bennu. *Remote Sens.* 13, 1315. <https://doi.org/10.3390/rs13071315>

B. Rozitis, A. J. Ryan, J. P. Emery, P. R. Christensen, V. E. Hamilton, A. A. Simon, D. C. Reuter, M. Al Asad, R.-L. Ballouz, J. L. Bandfield, O. S. Barnouin, C. A. Bennett, M. Bernacki, K. N. Burke, S. Cambioni, B. E. Clark, M. G. Daly, M. Delbo, D. N. DellaGiustina, **C. M. Elder**, R. D. Hanna, C. W. Haberle, E. S. Howell, D. R. Golish, E. R. Jawin, H. H. Kaplan, L. F. Lim, J. L. Molaro, D. P. Munoz, M. C. Nolan, B. Rizk, M. A. Siegler, H. C. M. Susorney, K. J. Walsh, D. S. Lauretta (2020) Asteroid (101955) Bennu's weak boulders and thermally anomalous equator. *Sci. Adv.* 6, eabc3699.

Bottke, W. F., D. Vokrouhlický, R.-L. Ballouz, O. S. Barnouin, H. C. Connolly, Jr., **C. Elder**, S. Marchi, T. J. McCoy, P. Michel, M. C. Nolan, B. Rizk, D. J. Scheeres, S. R. Schwartz, K. J. Walsh, D. S. Lauretta (2020) Interpreting the Cratering Histories of Bennu, Ryugu, and Other Spacecraft-explored Asteroids, *The Astronomical Journal* 160:14, 37pp.

Elder, C.M., B. Douglass, R.R. Ghent, P.O. Hayne, J.-P. Williams, J.L. Bandfield, E. Costello, (2019) The Subsurface Coherent Rock Content of the Moon as Revealed by Cold-Spot Craters. *Journal of Geophysical Research - Planets* 124, 3373-3384.

Walsh, K. J., E. R. Jawin, R-L. Ballouz, O. S. Barnouin, E. B. Bierhaus, H. C. Connolly, J. L. Molaro, T. J. McCoy, M. Delbo, C. M. Hartzell, M. Pajola, S. R. Schwartz, D. Trang, E. Asphaug, K. J. Becker, C. B. Beddingfield, C. A. Bennett, W. F. Bottke, K. N. Burke, B. C. Clark, M. G. Daly, D. N. DellaGiustina, J. P. Dworkin, **C.M. Elder**, D. R. Golish, A. R. Hildebrand, R. Malhotra, J. Marshall, P. Michel, M. C. Nolan, M. E. Perry, B. Rizk, A. Ryan, S. A. Sandford, D. J. Scheeres, H. C. M. Susorney, F. Thuillet, D. S. Laretta & The OSIRIS-REx Team (2019) Craters, boulders and regolith of (101955) Bennu indicative of an old and dynamic surface. *Nature Geoscience* 12, 242-246.

DellaGiustina, D. N., J. P. Emery, D. R. Golish, B. Rozitis, C. A. Bennett, K. N. Burke, R-L. Ballouz, K. J. Becker, P. R. Christensen, C. Y. Drouet d'Aubigny, V. E. Hamilton, D. C. Reuter, B. Rizk, A. A. Simon, E. Asphaug, J. L. Bandfield, O. S. Barnouin, M. A. Barucci, E. B. Bierhaus, R. P. Binzel, W. F. Bottke, N. E. Bowles, H. Campins, B. C. Clark, B. E. Clark, H. C. Connolly Jr., M. G. Daly, J. de Leon, M. Delbo, J. D. P. Deshapriya, **C.M. Elder**, S. Fornasier, C. W. Hergenrother, E. S. Howell, E. R. Jawin, H. H. Kaplan, T. R. Kareta, L. Le Corre, J.-Y. Li, J. Licandro, L. F. Lim, P. Michel, J. Molaro, M. C. Nolan, M. Pajola, M. Popescu, J. L. Rizos Garcia, A. Ryan, S. R. Schwartz, N. Shultz, M. A. Siegler, P. H. Smith, E. Tatsumi, C. A. Thomas, K. J. Walsh, C. W. V. Wolner, X.-D. Zou, D. S. Laretta & The OSIRIS-REx Team (2019) Properties of rubble-pile asteroid (101955) Bennu from OSIRIS-REx imaging and thermal analysis. *Nature Astronomy* 3, 341-351.

Elder, C.M., A. M. Bramson, L. W. Blum, H. T. Chilton, A. Chopra, C. Chu, A. Das, A. Davis, A. Delgado, J. Fulton, L. Jozwiak, A. Khayat, M. Landis, J. L. Molaro, M. Slipski, S. Valencia, J. Watkins, C. Young, C. J. Budney, K. L. Mitchell (2018) OCEANUS: A high science return Uranus orbiter with a low-cost instrument suite. *Acta Astronautica* 148, 1-11.

Hayne, P. O., J. L. Bandfield, M. A. Siegler, A. R. Vasavada, R. R. Ghent, J.-P. Williams, B. T. Greenhagen, O. Aharonson, **C.M. Elder**, P. G. Lucey, D. A. Paige (2017) Global Regolith Properties of the Moon from the Diviner Lunar Radiometer Experiment. *Journal of Geophysical Research - Planets* 122, 2371-2400.

Elder, C.M., P. O. Hayne, J. L. Bandfield, R. R. Ghent, J.-P. Williams, K. L. Donaldson Hanna, D. A. Paige (2017) Young Lunar Volcanic Features: Thermophysical Properties and Formation. *Icarus* 290, 224-237.

Elder, C.M., V. J. Bray, H. J. Melosh (2012) The Theoretical Plausibility of Central Pit Crater Formation Via Melt Drainage. *Icarus* 221, 831-843.

CONFERENCE PAPERS

Nenas, I. A., L. Kerber, A. Parness, R. Kornfeld, G. Sellar, P. McGarey, T. Brown, M. Paton, M. Smith, A. Johnson, M. Heverly, J. Sawoniewicz, C. Yahnker, T. Paileva-

nian, E. Sunada, B. Gaume, A. Curtis, **C. Elder**, K. Uckert, M. Vaquero, Y. Cheng, B. Denevi, L. Jozwiak, A. Stickle, J. Whitten, L. Keszthelyi, J. Haruyama, R. Wagner, P. Hayne, T. Horvath, J. Head, J. Hopkins, J. Ricks, E. Boster (2019) Moon Diver: A Discovery Mission Concept for Understanding the History of Secondary Crusts through the Exploration of a Lunar Mare Pit. *IEEE Aerospace Conference* pp. 1-23. 10.1109/AERO.2019.8741788

CONFERENCE PRESENTATIONS

(*Postdoc supervised, Student supervised)

2024

*Wilcoski, A., **C.M. Elder**, M. Landis, P. Hayne (2024) "Volatile Composition of Volcanically Sourced Lunar Ice Deposits" Asia Oceania Geosciences Society 21st Annual Meeting.

Elder, C.M., J. Blacksberg, S. Brooks, B. Buratti, M. Choukroun, C. Cochrane, I. Daubar, S. Diniega, C. M. Ernst, M. Gudipati, H. Korth, E. Leonard, R. Pappalardo, W. Patterson, S. Piqueux, J. Roberts, G. Steinbruegge, D. Turner, E. Turtle (2024) "Leveraging Investigation Scientists to Achieve Interdisciplinary Science" The Uranus Flagship: Investigating new paradigms for outer planet exploration.

Scully, J.E.C., C. A. Denton, J. C. Castillo-Rogez, M. M. Sori, **C. M. Elder**, E. J. Leonard, R. Cartwright, K. L. Mitchell, T. A. Nordheim and C. Beddingfield (2024) "Analogous Surface Features on Umbriel, Oberon and Ceres, and Suggested Hypothesis Testing with UOP" The Uranus Flagship: Investigating new paradigms for outer planet exploration.

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Beddingfield, C. B., E. J. Leonard, **C. M. Elder**, T. A. Nordheim, R. J. Cartwright, C. Cochrane, L. Regoli, and D. Atkinson (2021) A Digital Elevation Model of Miranda's Youngest Corona, Inverness. Lunar and Planetary Science Conference, #52, abstract #2543.

Scully, J. E. C., Cerretti, A. Viswanathan, J. K. Steckloff, C. Richey, A. Probst, G. Poh, M. Melwani Daswani, C. L. McLeod, X. Mao, R. Lillis, N. Kumari, H. Kraus, T. Hoogenboom, H. Hay, T. A. Goudge, E. C. Fayolle, **C. M. Elder**, S. Diniega, S. Daftry, P. K. Byrne, S. M. Brooks, J. G. Blank, P. Becerra, S. Bandyopadhyay (2021) Foreign Nationals Employed and Studying in Planetary Research in the United States, and Recommendations for Supporting this Group. Lunar and Planetary Science Conference, #52, abstract #1493.

S. D. Vance, **C. Elder**, A. Hofmann, S. Howell, M. Milazzo, R. T. Pappalardo, J.L. Noviello, D. A. Patthoff, Z. Khan, J. Rathbun, J. Vertesi and co-signers of the associated 2023 Planetary Science Decadal White Paper (2021) Addressing Mental Health in Planetary Science. Lunar and Planetary Science Conference, #52, abstract #2552.

2020

Rozitis, B., AJ Ryan, JP Emery, PR Christensen, VE Hamilton, AA Simon, DC Reuter, M Al Asad, RL Ballouz, JL Bandfield, OS Barnouin, CA Bennett, M Bernacki, KN Burke, S Cambioni, BE Clark, MG Daly, M Delbo, DN DellaGiustina, **CM Elder**, RD Hanna, CW Haberle, ES Howell, D Golish, ER Jawin, HH Kaplan, LF Lim, JL Molaro, D Pino Munoz, MC Nolan, B Rizk, MA Siegler, HCM Susorney, KJ Walsh, DS Loretta (2020) Thermophysical Properties of Bennu and the OSIRIS-REx Sample Sites. AAS Division for Planetary Sciences Meeting 52, Abstract #400.06.

Rathbun, J., **C Elder**, J Keane, C Richey, R Watkins, N Zellner (2021) Enabling the Planetary Workforce to Do the Best Science by Funding Work That is a Service to the Profession. AAS Division for Planetary Sciences Meeting 52, Abstract #502.03.

Elder C. M., B. Douglass, R.R. Ghent, P.O. Hayne, J.-P. Williams, E. Costello (2020) The Subsurface Coherent Rock Content of the Moon as Revealed by Cold-Spot Craters. Lunar and Planetary Science Conference, #51, abstract #1167.*

Pajola, M., B. Rizk, E.R. Jawin, K.J. Walsh, D.N. DellaGiustina, H. Campins, J.L. Molaro,

M. Delbo, T.J. McCoy, S.R. Schwartz, R. Ballouz, G. Poggiali, J.R. Brucato, E. Dotto, E.B. Bierhaus, K. Burke, C.A. Bennett, M.G. Daly, **C. Elder**, P. Michel, O.S. Barnouin, M.C. Nolan, and D.S. Lauretta (2020) Surface Density and Size Distribution of Clasts on (101955) Bennu's Boulders: Exposed Clasts or Fallback Material? Lunar and Planetary Science Conference, #51, abstract #1400.*

Kerber, L., B.W. Denevi, I. Nefzger, L. Keszthelyi, J.W. Head, C. Pieters, L. Wilson, J. Haruyama, R.V. Wagner, P.O. Hayne, J.W. Ashley, J.L. Whitten, A.M. Stickle, A. Parness, K. Donaldson Hanna, R.C. Anderson, D.M. Needham, P. Isaacson, L. Jozwiak, R. Klima, C. Jackson, T.C. Prissel, C.W. Hamilton, K. Uckert, **C. Elder**, and A. Colaprete (2020) Moon Diver: Journey into the Ancient Lavas of the Moon. Lunar and Planetary Science Conference, #51, abstract #1857.*

Diniega, S., Julie Castillo-Rogez, Ingrid Daubar, **Catherine Elder**, Robert Pappalardo, Christina Richey, Jennifer Scully, Mickey Villarreal (2020) Why and How to Write a Useful "Code of Conduct" for Planetary Conferences and Mission Teams. Lunar and Planetary Science Conference, #51, abstract #2482.*

Elder, C.M., T. Nordheim, D.A. Patthoff, E. Leonard, R. Cartwright, C. Cochrane, C. Paranicas, M. Tiscareno, A. Masters, D. Hemingway, M. Sori, H. Cao, R. Pappalardo, B. Buratti, I. De Pater, W. Grundy, M. Showalter, B. Kurth, I. Jun, J. Moses, K. Aplin, J. Casani (2020) Uranus Magnetosphere and Moons Investigator (UMaMI). Lunar and Planetary Science Conference, #51, abstract #2277.*

Roberts, J.H. A.M. Rymer, M.L. Cable, F. Nimmo, C.S. Paty, M.T. Bland, **C.M. Elder**, H. Korth, T.B. McCord, W.B. McKinnon, R.T. Pappalardo, C.A. Raymond, L. Roth, J. Saur, D.M. Schroeder, G. Steinbrugge, K.M. Soderlund, G. Tobie, S.D. Vance, D.A. Young, D.A. Senske, and the Europa Clipper Interior Thematic Working Group (2020) Integrated Europa Interior Science with Europa Clipper. Lunar and Planetary Science Conference, #51, abstract #2281.*

*Note the Lunar and Planetary Science Conference, #51 was canceled due to the COVID-19 outbreak. Abstracts included here were accepted and scheduled for oral or poster presentations but not presented.

2019

Pajola, M. B. Bierhaus, K.J. Walsh, D.N. DellaGiustina, E.R. Jawin, M. Delbo, J. Molaro, S.R. Schwartz, R.-L. Ballouz, C.A. Bennett, B. Rizk, K.N. Burke, H. Campins, J.R. Brucato, G. Poggiali, E. Dotto, M.G. Daly, **C.M. Elder**, P. Michel, M.E. Perry, O.S. Barnouin, M.C. Nolan and D.S. Lauretta (2019) Surface densities and size-frequency distributions of meter-size boulders inside craters on (101955) Bennu. American Geophysical Union Fall Meeting.

Ryan, A.J., D. Pino-Munoz, J.P. Emery, M. Delbo, B. Rozitis, R.-L. Ballouz, J.L. Molaro, M. Bernacki, J. Bandfield, **C. Elder**, M. Siegler, and D.S. Lauretta (2019) Thermal Modeling to Determine the Existence and Nature of Layered Material on Bennu. Asteroid Science in the Age of Hayabusa2 and OSIRIS-REx, abstract #2189.

Bottke, W.F., D. Vokrouhlicky, R.-L. Ballouz, O.S. Barnouin, H.C. Connolly Jr., **C. Elder**, T.J. McCoy, P. Michel, M.C. Nolan, B. Rizk, D.J. Scheeres, S.R. Schwartz, K.J. Walsh, D.S. Lauretta (2019) Interpreting the Cratering History of Bennu, Ryugu, and Other Space-Craft Explored Asteroids. Asteroid Science in the Age of Hayabusa2 and OSIRIS-REx, abstract #2189.

Elder, C.M., B. Douglass, R.R. Ghent, P.O. Hayne, J.-P. Williams, J.L. Bandfield, E. Costello (2019) The Subsurface Coherent Rock Content of the Moon as Revealed by Cold-spot Craters. Geologic Society of America Annual Meeting T93 13-10 (invited).

Bottke W., D. Vokrouhlicky, R. Ballouz, O. Barnouin, H. Connolly, **C. Elder**, D. Lauretta, T. McCoy, P. Michel, M. Nolan, B. Rizk, D. Scheeres, S. Schwartz, and K. Walsh (2019) Interpreting the Cratering History of Bennu, Ryugu, and Other Spacecraft-Explored Asteroids. European Planetary Science Congress-Division of Planetary Science Joint Meeting abstract #862

Ryan, A., J. Emery, B. Rozitis, P. Christensen, V. Hamilton, M. Delbo, D.P. Munoz, M. Bernacki, K. Walsh, R. Ballouz, B. Clark, D. DellaGiustina, **C. Elder**, E. Howell, L. Lim, J. Molaro, M. Nolan, B. Rizk, S. Schwartz, M. Siegler and the OSIRIS-REx Team (2019) Physical Interpretation of Bennu's Thermal Inertia. European Planetary Science Congress-Division of Planetary Science Joint Meeting abstract #324.

Maurizio P., E. Bierhaus, K. Walsh, D. DellaGiustina, E. Jawin, M. Delbo, J. Molaro, S. Schwartz, R. Ballouz, C. Bennett, B. Rizk, K. Burke, H. Campins, J.R. Brucato, E. Dotto, M. Daly, **C.M. Elder**, P. Michel, M. Perry, O. Barnouin and the OSIRIS-REx Team (2019) Boulders inside the craters of asteroid (101955) Bennu: Surface densities and size-frequency distributions. European Planetary Science Congress-Division of Planetary Science Joint Meeting abstract #187.

L. Kerber, B.W. Denevi, I. Nefas, L. Keszthelyi, J.W. Head, C. Pieters, L. Wilson, J. Haruyama, R.V. Wagner, P.O. Hayne, J.W. Ashley, J.L. Whitten, A.M. Stickle, A. Parness, K. Donaldson Hanna, R.C. Anderson, D.M. Needham, P. Isaacson, L. Jozwiak, R. Klima, C. Jackson, T.C. Prissel, C.W. Hamilton, K. Uckert, **C. Elder** (2019) Moon Diver: A Discovery Mission Concept for Understanding Secondary Crust Formation Through the Exploration of a Lunar Mare Pit Cross-Section. European Lunar Symposium.

Elder, CM, B Douglass, PO Hayne, RR Ghent, J-P Williams, JL Bandfield, E Costello (2019) Mapping Regolith Thickness on the Moon Using a New Class of Young Craters. Lunar and Planetary Science Conference, #50, abstract #2485.

Klimczak, C., P.K. Byrne, P.V. Regensburger, D.R. Bohnenstiehl, S.A. Hauck, A.J. Dombard, D.J. Hemingway, S.D. Vance, D.M. Melwani, **C.M. Elder** (2019) Strong Ocean Floors Within Europa, Titan, and Ganymede Limit Geological Activity There; Enceladus Less So. Lunar and Planetary Science Conference, #50, abstract #2912.

L. Kerber, B.W. Denevi, I. Nefas, L. Keszthelyi, J.W. Head, C. Pieters, L. Wilson, J. Haruyama, R.V. Wagner, P.O. Hayne, J.W. Ashley, J.L. Whitten, A.M. Stickle, A. Parness, K. Donaldson Hanna, R.C. Anderson, D.M. Needham, P. Isaacson, L. Jozwiak, R. Klima, C. Jackson, T.C. Prissel, C.W. Hamilton, K. Uckert, **C. Elder** (2019) Moon Diver:

A Discovery Mission Concept for Understanding Secondary Crust Formation Through the Exploration of a Lunar Mare Pit Cross-Section. Lunar and Planetary Science Conference, #50, abstract #1163

M Pajola, K Burke, D DellaGiustina, D Lauretta, B Rizk, C Bennett, K Walsh, E Jawin, M Delbo, JL Molaro, SR Schwartz, R Ballouz, JR Brucato, E Dotto, EB Bierhaus, H Campins, M Daly, **C Elder**, P Michel, O Barnouin, MC Nolan (2019) Global and Select Regional Size-Frequency Distribution of Boulders on Asteroid (101955) Bennu. Lunar and Planetary Science Conference, #50, abstract #1575.

Molaro, J.L., M. Delbo, R.-L. Ballouz, E. Jawin, K. Walsh, M. Pajola, T. McCoy, S. Schwartz, **C.M. Elder**, D. DellaGiustina, B. Rizk, C. d'Aubigny, D.S. Lauretta, OSIRIS-REx Team (2019) Fracture Formation Mechanisms on Bennu and Evidence of Thermally Driven Breakdown. Lunar and Planetary Science Conference, #50, abstract #1597.

Emery, JP, B Rozitis, PR Christensen, VE Hamilton, AA Simon, DC Reuter, M Delbo, LF Lim, CA Thomas, BE Clark, A Ryan, **CM Elder**, MA Siegler, ES Howell, MC Nolan, DS Lauretta, Osiris-Rex Team (2019) Thermophysical Properties of (101955) Bennu from OSIRIS-REx Observations. Lunar and Planetary Science Conference, #50, abstract #2582.

Pajola, M., D. DellaGiustina, C. Bennett, K. Burke, D. S. Lauretta, B. Rizk, M. Delbo, K. Walsh, J. R. Brucato, E. Dotto, E. B. Bierhaus, H. Campins, M. Daly, **C.M. Elder**, P. Michel, J. Molaro, M. C. Nolan, S. R. Schwartz & The OSIRIS-REx Team (2019) Scientific Analysis of the Size-Frequency Distribution of Boulders ≥ 10 m on Asteroid (101955) Bennu. Italian Congress of Planetology XV.

Hayne, P. O., D. A. Paige, J.-P. Williams, **C.M. Elder**, M. A. Siegler, J. L. Bandfield, L. Rubanenko, T. Powell, T. Horvath, N. M. Bowles (2019) Lunar Thermal Models: New Insights from the Diviner Lunar Radiometer Experiment. Thermal Models for Planetary Science III.

Emery, J. P., B. Rozitis, B., P. R. Christensen, V. E. Hamilton, M. Delbo, L. F. Lim, C.A. Thomas, A. A. Simon, B. E. Clark, A. Ryan, **C.M. Elder**, M. A. Siegler, E. S. Howell, M. C. Nolan, D. S. Lauretta, The OSIRIS-REx Team (2019) Thermophysics of (101955) Bennu: Observing and Thermal Modeling Plans of OSIRIS-REx and Initial Results from Approach Phase Data. Thermal Models for Planetary Science III.

2018

Elder, C.M., M. B. Bland (2018) The Plausibility of Silicate Volcanism on Europa's Seafloor. American Geophysical Union, Fall Meeting, abstract #P41B-07.

Kerber, L., B. W. Denevi, I. A. Nenas, L. P. Keszthelyi, **C.M. Elder (presenter)**, J. W. Head, C.M. Pieters, R. G. Sellar, A. M. Stickle, R. L Klima, P. O. Hayne, Jennifer L Whitten, Michael Paton, Patrick McGarey, Kerri Donaldson Hanna, Robert C Anderson, Travis Brown, Debra Hurwitz Needham, Peter Isaacson, Kyle Uckert, Lauren M Jozwiak, Christopher Hamilton, Robert Wagner, Karl L Mitchell, James Warren Ashley, Junichi Haruyama, Aaron Parness, Miles W Smith, Richard P Kornfeld, Tyler Horvath,

Tabb C Prissel, Colin Jackson, (2018) Moon Diver: A Discovery Mission Concept for Understanding Planetary Flood Basalts through the Exploration of a Lunar Mare Cross-Section. American Geophysical Union, Fall Meeting, abstract #P54D-09.

Emery, J.P., B. Rozitis, P. R. Christensen, V. E. Hamilton, M. Delbo, L. F. Lim, C. A. Thomas, B. E. Clark, A. Ryan, **C.M. Elder**, M. A. Siegler, M. C. Nolan, D. S. Lauretta, The OSIRIS-REx Team, (2018) Thermophysical Properties of (101955) Bennu from OSIRIS-REx Approach Phase Data. American Geophysical Union, Fall Meeting, abstract #P21A-06.

Pajola, M., D. DellaGiustina, C. Bennett, K. Burke, D. S. Lauretta, B. Rizk, M. Delbo, K. Walsh, J. R. Brucato, E. Dotto, E. B. Bierhaus, H. Campins, M. Daly, **C.M. Elder**, P. Michel, J. Molaro, M. C. Nolan, S. R. Schwartz, The OSIRIS-REx Team, (2018) The Size-Frequency Distribution of Boulders >10 m on Asteroid 101955 Bennu: landing safety and scientific return. American Geophysical Union, Fall Meeting, abstract #P33C-3854.

Molaro, J. L., C. Nielsen, M. Pajola, **C.M. Elder** (2018) The interaction between grain- and boulder-scale effects on thermally induced rock. American Geophysical Union, Fall Meeting, abstract #P51D-2911.

Elder, C.M. and Bland, M. (2018) Partially Molten Magma Oceans on Io and Europa. Geologic Society of America 130th Annual Meeting, Paper No. 67-13 (invited).

Martinez-Camacho, J. M., P. O. Hayne, **C.M. Elder** (2018) Thermal Inertia of Rocks on the Moon. Lunar and Planetary Science Conference, #49, abstract #2556.

Haber, J. T., P. O. Hayne, **C.M. Elder** (2018) Rock Abundance and Surface Ages in the Lunar Maria. Lunar and Planetary Science Conference, #49, abstract #2463.

2017

Elder, C.M., P. O. Hayne, T. D. Glotch (2017) Low Thermal Inertia Volcanic Deposits on the Moon. International Association of Volcanology and Chemistry of the Earth's Interior 2017 Scientific Assembly #361.

Glotch, T. D., **C.M. Elder**, P. O. Hayne, B. T. Greenhagen, D. Dhingra, W. S. Kiefer, G. J. Taylor (2017) Composition and physical properties of silicic features on the Moon. SSERVI Exploration Science Forum.

Elder, C.M. and P. O. Hayne (2017) The Lunar Rock Size Frequency Distribution from Diviner Infrared Measurements. European Lunar Symposium.

Glotch, T. D., **C.M. Elder**, P. O. Hayne, B. T. Greenhagen, D. Dhingra, W. S. Kiefer (2017) Overview of Silicic Magmatic Activity on the Moon. New Views of the Moon 2 - Europe.

Bramson, A. M., **C.M. Elder**, L. W. Blum, H. T. Chilton, A. Chopra, C. Chu, A. Das, A. B. Davis, A. Delgado, J. Fulton, L. Jozwiak, A. Khayat, M. E. Landis, J. L. Molaro, M. Slipiski, S. Valencia, J. Watkins, C. L. Young, C. J. Budney, K. L. Mitchell (2017) OCEANUS: A Uranus Orbiter Concept Study from the 2016 NASA/JPL Plan-

etary Science Summer School. Lunar and Planetary Science Conference, #48, abstract #1583.

Elder, C.M. and P. O. Hayne (2017) Thermophysical Properties of Lunar Volcanic Deposits. Lunar and Planetary Science Conference, #48, abstract #2431.

Elder, C.M., A. M. Bramson, L. W. Blum, H. T. Chilton, A. Chopra, C. Chu, A. Das, A. Davis, A. Delgado, J. Fulton, L. Jozwiak, A. Khayat, M. E. Landis, J. L. Molaro, M. Slipski, S. Valencia, J. Watkins, C. L. Young, C. J. Budney, K. L. Mitchell (2017) New Frontiers-Class Missions to the Ice Giants. Planetary Science Vision 2050 Workshop #8147.

Hendrix, A. R., Hurford, T. A., the ROW Team (2017) Roadmaps to Ocean Worlds. Planetary Science Vision 2050 Workshop #8171.

2016

Elder, C.M., P. O. Hayne, K. L. Donaldson Hanna, J. L. Bandfield, R. R. Ghent, J.-P. Williams and D. A. Paige (2016) Young Lunar Volcanic Features: Thermophysical Properties and Formation. American Geophysical Union, Fall Meeting, abstract #P51D-08 (invited).

Elder, C.M., P. O. Hayne, S. Piqueux, J. L. Bandfield, J.-P. Williams, R. R. Ghent and D. A. Paige (2016) The Lunar Rock Size Frequency Distribution from Diviner Infrared Measurements. American Geophysical Union, Fall Meeting, abstract #P24A-04.

Piqueux, S., P. O. Hayne, A. Kleinboehl, C. S. Edwards, **C.M. Elder**, N. G. Heavens, D. M. Kass, D. J. McCleese, J. T. Schofield, J. H. Shirley, M. D. Smith (2016) Global Surface Dust Distribution Changes on Mars (MY24-33). American Geophysical Union, Fall Meeting, abstract #P21A-2074.

Elder, C.M., P. O. Hayne, K. L. Donaldson Hanna, J. L. Bandfield, J.-P. Williams, R. R. Ghent, D. A. Paige. (2016) Young Lunar Volcanic Features: How Did They Form? EPSC-DPS Joint Meeting, #215.11.

Elder, C.M., A. M. Bramson, A. Davis, H. T. Chilton, L. W. Blum, A. Chopra, C. Chu, A. Khayat, A. Delgado, J. Fulton, L. Jozwiak, M. Landis, J. L. Molaro, M. Slipski, S. Valencia, A. Das, J. Watkins, C. Young, C. J. Budney, K. L. Mitchell. (2016) OCEANUS: A Concept Study for a Uranus Orbiter Mission from the 2016 NASA/JPL Planetary Science Summer School. Outer Planet Assessment Group Meeting.

Hayne P. O., J. L. Bandfield, A. R., Vasavada, R. R. Ghent, M. A. Siegler, J.-P. Williams, B. T. Greenhagen, **C.M. Elder**, D. A. Paige (2016) Global Regolith Properties from Diviner Thermal Infrared Measurements. New Views of the Moon 2. #6065.

Elder, C.M., P. O. Hayne, R. R. Ghent, J. L. Bandfield, J.-P. Williams, D. A. Paige (2016) Regolith Formation on Young Lunar Volcanic Features. Lunar and Planetary Science Conference, #46, abstract #2785.

Piqueux, S., P. O. Hayne, **C.M. Elder**, B. T. Greenhagen, D. A. Paige, J.-P. Williams, M. Siegler (2016) Depth-Dependency of Lunar Regolith Thermophysical Properties from

Transient Shadows Observed by Diviner. Lunar and Planetary Science Conference, #46, abstract #1762.

2015

Elder, C.M., P. O. Hayne, S. Piqueux, J. L. Bandfield, R. R. Ghent, J.-P. Williams, D. A. Paige (2015) New Constraints on the Rock Size Distribution on the Moon from Diviner Infrared Measurements. American Geophysical Union, Fall Meeting, abstract #P53B-2120.

Hayne, P. O., R. R. Ghent, J. L. Bandfield, A. Vasavada, J.-P. Williams, M. Siegler, P. Lucey, B. Greenhagen, **C.M. Elder**, D. A. Paige (2015) Regolith Formation Rates and Evolution from the Diviner Lunar Radiometer. American Geophysical Union, Fall Meeting, abstract #P43F-02.

Elder, C.M., P. J. Tackley, A. P. Showman (2015) Heat Loss Through Volcanism on Io. Comparative Tectonic and Geodynamics of Venus, Earth and Rocky Exoplanets, abstract # 1839.

2014

Elder, C.M., P. J. Tackley, A. P. Showman (2014) Convection and Melt Migration in Io's Mantle. American Geophysical Union, Fall Meeting, abstract #P41E-08.

Elder, C.M., A. P. Showman (2014) Melt Migration Through Io's Convecting Mantle. Lunar and Planetary Science Conference, #45, abstract #1651.

Elder, C.M., P. J. Tackley, A. P. Showman (2014) Convection in Io's Partially Molten Mantle. Lunar and Planetary Science Conference, #45, abstract #2336.

2013

Elder, C.M., A. P. Showman (2013) Melt Migration Through Io's Convecting Mantle. American Geophysical Union, Fall Meeting, abstract #P51C-1751.

Elder, C.M., V. J. Bray, H. J. Melosh (2013) The Theoretical Plausibility of Central Pit Crater Formation via Melt Drainage. Lunar and Planetary Science Conference, #44, abstract #2796.

Elder, C.M., A. P. Showman (2013) Melt Migration Through Io's Convecting Mantle. Lunar and Planetary Science Conference, #44, abstract #2993.

2011

Elder, C.M., A. P. Showman (2011) Tidal Dissipation in a Partially Molten Material. EPSC-DPS Joint Meeting, p. 623.

2010

Elder, C.M., V. J. Bray, H. J. Melosh (2010) Central Pit Formation in Ganymede Craters Via Melt Drainage. Lunar and Planetary Science Conference, #41, abstract #2519.

2007

Elder, C.M., P. Helfenstein, P. Thomas, J. Veverka, J. A. Burns, T. Denk, C. Porco (2007) Tethys Mysterious Equatorial Band. American Astronomical Society, DPS #39, abstract #11.06.

Rauscher, E., J. Harrington, **C.M. Elder**, D. Deming, L. J. Richardson, S. Seager, K. Horning, K. Menou (2007) Looking for Variability in Two Spitzer Secondary Eclipses of HD 209458b at 24 Microns. American Astronomical Society, DPS #39, abstract #22.01.