

Hannah C.M. Susorney

Marie Sklodowska-Curie Research Fellow
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RESEARCH INTERESTS

Impact Cratering, Surface Roughness, Laser Altimetry, Surface Geology (asteroids and terrestrial planets),
Impact Simulations, Polar Deposits

EDUCATION

- 2017 Ph.D., **Johns Hopkins University**, Baltimore, Maryland
Earth and Planetary Science
Advisors: Olivier S. Barnouin & Darrell F. Strobel
Thesis: Using Altimetry to Investigate Impact Cratering in the Solar System
- 2015 M.A., **Johns Hopkins University**, Baltimore, Maryland
Earth and Planetary Science
- 2013 B.S., **Montana State University**, Bozeman, Montana
Major: Earth Science: Geology
Minor: Mathematics

RESEARCH EXPERIENCE

- 2020–2021 Marie Sklodowska-Curie Fellow, **University of Bristol**, Bristol, United Kingdom
- 2018–2020 Visiting Research Associate, **University of Bristol**, Bristol, United Kingdom
- 2017–2020 Postdoctoral Fellow, **University of British Columbia**, Vancouver, Canada
Advisor: Catherine L. Johnson
- 2013–2017 Graduate Research Assistant, **Johns Hopkins University**, Baltimore, Maryland
and **Johns Hopkins University Applied Physics Laboratory**, Laurel, Maryland
Advisor: Olivier S. Barnouin
- 2012, 2013 Intern, **Johns Hopkins University Applied Physics Laboratory**, Laurel, Maryland
Advisors: Carolyn M. Ernst, Nancy L. Chabot, and Olivier S. Barnouin

SPACECRAFT MISSION EXPERIENCE

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| OSIRIS-REx, OSIRIS-REx Laser Altimeter (OLA) Team Member | 2017-present |
| OSIRIS-REx, Science Collaborator | 2018-present |

PUBLICATIONS

Refereed Publications

14. Rozitis, B., Emery, J.P., Siegler, M.A., **Susorney, H.C.M.**, Molaro, J.L., Hergenrother, C.W., and Lauretta, D. S. AImplications for ice stability and particle ejection from high-resolution temperature modeling of asteroid (101955) Bennu (in press)
13. Kinczyk, M.J., Byrne, P.B., Prockter, L.M., **Susorney, H.C.M.**, and Barnouin, O. S. A morphological evaluation of crater degradation on Mercury: Revisiting crater classification with MESSENGER data (2020), *Icarus*, 341, 113637.
12. Barnouin O.S., Daly, M. G., Palmer, E. E. Johnson, C. L., Gaskell, R.W., Al Asad, M., Bierhaus, E. B., Craft, K. L., Ernst, C.M., Espiritu, R.C., Nair, H., Neumann, G.A., Nguyen, L., Nolan, M.C., Mazarico, E., Perry, M.E., Philpott, L.C. Roberts, J.H., Steele, R.J., Seabrook, J., **Susorney, H.C.M.**, Weirich, J.R., Lauretta, D.S., and the OSIRIS-REx Team. Digital Terrain Mapping by the OSIRIS-REx Mission (2020), *Planetary and Space Sciences*, 180, 104764.
11. Barnouin, O.S., Daly, M.G., Palmer, E.E., Gaskell, R.W., Weirich, J.R., Johnson, C.L., Al Asad, M.M., Roberts, J.H., **Susorney, H.C.M.**, Daly, T., Bierhaus, E.B., Seabrook, J., Perry, M.E., Espiritu, R.M., Nair, A.H., Nguyen, L., Neumann, G.A., Ernst, C.M., Boynton, W.V., Nolan, M.C. Adam, C. Moreau, M.C. Risk, B., D'Aubigny, C., Jawin, E.R., Walsh, K.J., Michel, P., Schwartz, S.R. Ballouz, R.-L., DellaGiustina, D.N., Mazarico, E.M., Scheeres, D.J., McMahon, J., Sugita, S., Hirata, N., Watanabe, S., and Lauretta, D.S., Shape of (101955) Bennu indicative of a rubble pile with internal stiffness (2019), *Nature Geoscience*, 12, 247-252.
10. Scheeres, D.J., McMahon, J.W., French, A.S., Brack, D.N., Chesley, S.R., Farnocchia, D., Takahashi, Y., Leonard, J., Geeraert, J., Page, B., Antreasian, P., Getzandanner, K., Rowlands, D., Mazarico, E., Small, J., Moreau, M., Emery, J., Rozitis, B., Hirabayashi, M., Sanchez, P., Van wal, S., Tricarico1, P., Ballouz, R.-L., Johnson, C.L., Al Asad, M.M., **Susorney, H.C.M.**, Barnouin, O.S., Daly, M.G., Gaskell, R.W., Palmer, E.E., Weirich, J.R., Walsh, K.J., Jawin, E.R., Bierhaus, E.B., Michel, P., Bottke, W.F., Nolan, M.C., Lauretta, D.S., Connolly Jr., H.C., and the OSIRIS-REx Team. The dynamic geophysical environment of (101955) Bennu based on OSIRIS-REx measurements (2019), *Nature Astronomy*, 3, 352-361.
9. Walsh, K.J., Jawin, E.R., Ballouz, R.L., Barnouin, O.S., Bierhaus, E.B., Connolly Jr., H.C., Malaro, J.L., McCoy, T., Lauretta, D.S., Delbo, M., Hartzell, C., Pajola, M., Schwartz, S.R., Trang, D., Asphaug, E., Becker, K., Beddingfield, C. B., Bottke, W.F., Bennett, C.A., Burke, K., Clark, B.C., Daly, M.G., DellaGuistina, D.D., Dworkin, J.P., Elder, C.M., Golish, D., Hildebrand, A.R., Malhotra, R., Marshall, J., Michel, P., Nolan, M., Perry, M.E., Rizk, B., Ryan, A., Sandford, S., Scheeres, D.J., **Susorney, H.C.M.**, Thuillet, F., and the OSIRIS-REx Team, Craters, boulders and regolith of (101955) Bennu indicative of an old and dynamic surface (2019), *Nature Geoscience*, 12, 242-246.
8. **Susorney, H.C.M.**, Johnson, C.L., Barnouin, O.S., Daly, M.G., Seabrook, J., Bierhaus, E.B., and Lauretta, D.S. The Surface Roughness of 25143 Itokawa from the Hayabusa Laser Rangefinder and its Implications for Detecting Asteroid Interior Structure Using Topography (2019), *Icarus*, 325, 141-152.
7. **Susorney, H.C.M.**, James, P. B., Johnson, C.L., Chabot, N.L., Ernst, C. M., Mazarico, E. M., and Neumann, G. A. Measuring the Thickness of Radar-Bright Deposits on Mercury from Individual Mercury Laser Altimeter (MLA) Tracks (2019), *Icarus*, 323, 40-45.
6. **Susorney, H.C.M.**, Barnouin, O.S. The Surface Roughness of 433 Eros from the NEAR-Shoemaker Laser Rangefinder (2018), *Icarus*, 314, 299-310.
5. **Susorney, H.C.M.**, Barnouin, O.S., Ernst, C.M., Stickle, A.M. The Surface Roughness of Large Craters on Mercury (2018), *J. Geophys. Res. Planets.*, 123 (7), 1581-1595.
4. **Susorney, H.C.M.**, Barnouin, O.S., Stickle, A.M., Ernst, C.M., Crawford, D.A., and Cintala, M.J. The Role of Target Heterogeneity in Impact Crater Formation: Numerical Results (2017), *Procedia Engineering*, 204, 421-428.
3. **Susorney, H.C.M.**, Barnouin, O.S., Ernst, C.M., and Byrne, P.K. Surface Roughness from the Mercury Laser Altimeter (2017). *J. Geophys. Res. Planets*, 122 (6), 1372-1390.

2. Blewett, D.T., Stadermann, A.C., **Susorney, H.C.**, Ernst, C.M., Xiao, Z., Chabot, N.L., Denevi, B.W., Murchie, S.L., McCubbin, F.M., Kinczyk, M.J., Gillis-Davis, J.J., and Solomon, S.C. Analysis of MESSENGER high-resolution images of Mercury's hollows and implications for hollow formation (2016). *J. Geophys. Res. Planets*, 121(9), 1798-1813.
1. **Susorney, H.C.M.**, Barnouin, O.S., Ernst, C.M., Johnson, C.L. Impact Crater Morphology on Mercury from MESSENGER Altimetry and Imaging (2016). *Icarus*, 271, 180-193.

Invited Seminars

Laser Altimetry from Ice to Rocks, Department of Physical Sciences Open University, UK Fall 2018

HONORS

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| Johns Hopkins University Department of Earth and Planetary Science | 2016 |
| Best 60 minute Journal Club Graduate Student Presentation | |
| Stephen E. Dwornik Award | 2015 |
| Best Graduate Student Poster at Lunar and Planetary Science Conference | |
| Johns Hopkins University Department of Earth and Planetary Science | 2014 |
| Best 30 minute Journal Club Graduate Student Presentation | |
| National Science Foundation Graduate Research Fellowship, <i>Honorable Mention</i> | 2014 |
| Montana State University Top Geology Undergraduate | 2013 |
| Montana State University Undergraduate Scholars Program Research Grant | 2011, 2012 |

PROFESSIONAL SERVICE

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| Reviewed Papers in: <i>Journal of Geophysical Research-Planets</i> , <i>Advances in Space Research</i> , <i>Planetary and Space Sciences</i> | |
| Lunar Planetary Science Conference, <i>2019 Scientific Program Committee Member</i> | 2019 |
| NASA Small Body Advisory Group, <i>Committee Member</i> | 2017-2020 |
| <i>The Small Body Advisory Group identifies scientific priorities and opportunities for the exploration of small bodies (asteroids, comets, etc.) and reports findings to NASA headquarters.</i> | |
| NASA Review Panel, <i>External Reviewer</i> | 2018 |
| NASA Review Panel, <i>Panelist</i> | 2017 |
| Geological Society of America Student Advisory Council, <i>Chair</i> | 2015-2016 |
| Geological Society of America Planetary Geology Division, <i>Student Representative</i> | 2014-2016 |
| Local Organizing Committee for the Geological Society of America Annual Meeting | 2015 |

RESEARCH ACTIVITIES

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| Lunar Planetary Institute's Meteor Crater Field Camp, <i>Participant</i> | Meteor Crater, AZ, October 2014 |
| NSF International Research Experience for Students (IRES), <i>Participant</i> | Hangzhou, China, Summer 2011 |

GRANTS AWARDED

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| Marie Skłodowska-Curie Individual Fellowship | 225k EUR, starts 2020–2021 |
| Johns Hopkins Applied Physics Laboratory Graduate Student Fellowship | 240k USD, 2014–17 |
| Hopkins Extreme Materials Institute (HEMI) Student Travel Grant | 1k USD, 2017 |
| Hypervelocity Impact Society Alex Charters Student Scholar | 2k USD, 2017 |

Asteroids, Comets, and Meteorites 2017 Travel Grant

1k USD, 2017

TEACHING EXPERIENCE

Johns Hopkins University

Guest Lecturer Tour of the Solar System (1 lecture) Spring 2015, 2016, 2017 Guest Lecturer Planetary
Surface Processes (1 lecture) Fall 2015

Montana State University

Undergraduate Teaching Assistant for Honors Earth System Science Fall 2011, 2012

OUTREACH ACTIVITIES

Roots and Branches Elementary School West Baltimore, MD May 2015

- Presented on asteroids and impact craters to ~ 200 elementary age children.

The Johns Hopkins University Applied Physics Lab Laurel, MD Summer 2012, 2013

- Produced Images of the Day for the MESSENGER Public Website
- Assisted in responding to the public's question about Mercury and the MESSENGER mission

Father Marquette Middle School Marquette, MI May 2012

- Presented an hour long talk to two 6th grade classes (~ 30 students each) about planetary science.

SELECTED CONFERENCE ABSTRACTS

- **Susorney, H.C.M.**, Johnson, C.L., Barnouin, O.S., Daly, M.G., Rozitis, B., Al Asad, M.M., Walsh, K.J., Jawin, E., Gaskell, R.W., Palmer, E., Weirich, J., DellaGiustina, D., Rizk, B. Nolan, M.C., Lauretta, D.S., (2019) The Global Surface Roughness of (101955) Bennu: Results from the OSIRIS-REx Mission. 50th Lunar and Planetary Science Conference 2019, 1429. Houston, TX. USA.
- **Susorney, H.C.M.**, Barnouin, O.S., Stickle, A.M., Ernst, C.M., Crawford, D.A., and Cintala, M.J. (2017) The Role of Target Heterogeneity in Impact Crater Formation: Numerical Results. 14th Hypervelocity Impact Symposium. Canterbury, United Kingdom.
- **Susorney, H.C.M.**, and Barnouin, O.S. (2017) The Global Surface Roughness of 433 Eros: Implications for the Geology of Eros. Parellel5.b.2, Asteroids, Comets, and Meteors 2017. Montevideo, Uruguay.

MEMBERSHIPS

American Geophysical Union, Planetary Sciences Section, 2011-present
Geological Society of America, Planetary Geology Division, 2010-present
AAS Division of Planetary Science, 2015-present