

Angela G Marusiak, PhD

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EDUCATION

University of Maryland, Ph.D. 2020

Thesis: Planetary Seismology using Single-Station and Small-Aperture Arrays:
Implications for Mars and Ocean Worlds. <https://doi.org/10.13016/jrd0-dofk>

Boston University, B.A. 2013

EMPLOYMENT & EXPERIENCE

2023- **Assistant Research Professor** at University of Arizona, Lunar and Planetary Laboratory
2024- **LEMS Science Team Member and SeisLEMS Lead**
2020- **Dragonfly Science Team Associate**
2015- **InSight Science Team Collaborator**
2022-2023 **Geophysicist** at USGS
2020-2022 **Postdoctoral Scholar** at NASA/Caltech Jet Propulsion Laboratory
2015-2020 **Graduate Research Assistant, NESSF Fellow** at University of Maryland
2016 **NASA Intern** at Johns Hopkins University Applied Physics Laboratory
2014-2015 **Lecturer and Grader** at Rutgers University
2013-2014 **Technical Assistant** at Columbia University's Lamont Doherty Earth Observatory
2011-2013 **Research Assistant** at Center for Space Physics Boston University
2012 **NASA PGGURP Intern** at Johns Hopkins University Applied Physics
2010-2012 **Research Assistant** in Earth Science Dept, Boston University

AWARDS

2022 Seismological Society of America, Early Career Travel Grant
2018-2020 NASA Earth and Space Science Fellowship (NESSF)
2015-2020 Dean's Fellowship (UMD)
2019 Seismological Society of America (SSA) Travel Award
2019 Goldhaber Travel Grant
2017-2019 Earth System Science Interdisciplinary Center (ESSIC) Travel Award
2017 Best Pre-Candidacy Graduate Student Talk 2017 (UMD)
2013 Center for Space Physics Prize for Excellence in Research (BU)

SERVICE

2023 - Ocean Worlds Working Group (OWWG) Science Co-Lead
 2021, 2024 Reviewer, Planetary Science Journal
 2022, 2023 Reviewer, Icarus
 2022- 2024 Reviewer, GRL
 2021, 2022 AGU Session Primary Convener
 2021, 2022 NASA Panel Reviewer
 2022 SSA Session Co-lead
 2022 AbSciCon, Session Co-convener
 2022 Future Leaders of Ocean Worlds (FLOW) Communications Chair,
 Conference Chair
 2019, 2022 Judge, Dwornik Award at LPSC
 2020-2022 Reviewer, JGR: Planets
 2021 AGU OSPA Judge
 2019-2020 IDEA (Inclusion, Diversity, Equity, and Awareness) at UMD Geology
 Founding Committee Member
 2019 AGU Session Co-Convener
 2019 Reviewer, Planetary Data Systems
 2017-2019 College of Mathematics and Natural Sciences Graduate Student Council,
 Geology Dept. Representative
 2017-2019 NASA Panel Executive Secretary
 2018 Volunteer for Structural Geology Class Field Trip
 2018 Volunteer for Field Geophysics Class Field Trip

OUTREACH

2024 Sands Club Eclipse Day
 2019-2020 Skype-A-Scientist
 Oct. 2019 Two Scientists Walk into a Bar
 July 2019 Expert-Is-In, Smithsonian Natural History Museum
 2019-2020 Member of AGU's Voices for Science Class of 2019
 2019 Microblogger at LPSC
 2016-2019 Volunteer for Geology Department at University of Maryland, Maryland Day
 Open House
 2018 Volunteer for IRIS at USA Science & Engineering Festival

WORKSHOPS ATTENDED

2023 NASA's PI Launchpad Workshop
 2019 Jet Propulsion Laboratory Planetary Summer Science School
 2018 American Geophysical Union's Sharing your Science Workshop
 2017 Polenet Glacial Seismology Training School

MEMBERSHIPS/COLLABORATIONS

2024	Artemis III LEMS Instrument: Science Team Member and SeisLEMS lead
2020-	NASA's Dragonfly Mission: Science Team Associate
2015-	NASA's InSight Mission: Science Team Collaborator
2015-	Geological Society of America, Planetary Sciences Division
2015-	Earth Science Women's Network
2018-	Seismology Society of America
2018-	American Geophysical Union
2018-2020	Potomac Geophysical Society
2015-2020	Geological Society of Washington

INVITED/PUBLIC TALKS

1. University of Arizona, Lunar and Planetary Laboratory. 23 April 2024 "Lunar Seismology: Apollo's Legacy and the new Artemis Era"
2. Network for Ocean Worlds (NOW) Lecture Series Season 3, Episode 4 Exploring Ocean Worlds Through Analogs: Combined approaches to clathrates. 5 June 2023. "Clathrate effects on geophysical properties and detection"
3. Caltech, SeismoLab Brown Bag Seminar, 5th April 2023. "Exploration of Icy Ocean Worlds Using Seismology"
4. Georgia Tech, Earth and Atmospheric Sciences Dept. 12th January 2023. "Seismology on Icy Ocean Worlds"
5. University of Arizona, Lunar and Planetary Laboratory. 8th December 2022. "The Future of Planetary Exploration using Seismology"
6. Penn State University, Dept. of Geosciences Colloquium. 17th November 2022. "Exploring Icy Ocean Worlds using Seismology"
7. University of Colorado, Boulder, Geosciences Dept. Colloquium. 9th November 2022. "Exploration of Icy Ocean Worlds using Seismology"
8. ETH Zurich, Planetary Geophysics Seminar Series. June 6th 2022. "Detecting Seismicity on Icy Ocean Worlds: Lessons from fieldwork and modeling"
9. Carnegie Institution of Science in Washington, Earth and Planetary Lab, General Seminar Series. May 2nd 2022. "Detecting Seismicity on Icy Ocean Worlds: Lessons from fieldwork and modeling"
10. University of Iowa, Earth and Environment Department Seminar, 24th February 2022. "Seismic Investigations for Planetary Exploration"
11. JPL/Caltech High-Performance Computing Seminar, 16th February 2022. "Using Gattaca to create synthetic seismograms for planetary exploration"
12. Auburn University Department of Geosciences Colloquium, 8th February 2022. "Exploration of Planetary Bodies using Seismology"

13. UC Santa Cruz Department of Earth and Planetary Sciences Seminar, 4th February 2022. “Planetary Seismology on Icy Ocean Worlds”
14. Texas A&M Geology and Geophysics Dept. Seminar 24th January 2022. “Seismic Investigations for Planetary Investigations”
15. Network for Ocean Worlds (NOW) Lecture Series, Season 2, Episode 2, Geophysics and Habitability. 21st June 2021. “Geophysical Exploration of Potentially Habitable Worlds”
16. Jet Propulsion Laboratory, Postdoc Seminar Series, May 27th 2021, “Preparing for Icy Ocean World Seismology: Event Detection and Internal Structures”
17. UCLA Geophysics, Seismology, and Tectonics Seminar, April 28th 2021. “Preparing for Icy Ocean World Seismology: Modeling and Field Methods”
18. Incorporated Research Institutions for Seismology (IRIS) webinar, September 25th 2019. “The InSight mission to Mars: Seismology in the Solar System”
19. Potomac Geophysical Society, September 12th, 2019. “The InSight mission to Mars: Seismology in the Solar System”
20. Geological Society of Washington, February 6th, 2019. "Investigating Icy Worlds: How Greenland can help us Understand Ocean Worlds"
21. Thule Air Force Base, August 19th 2018. "Investigating Icy Worlds: How Greenland can help us Understand Ice Covered Worlds"

PEER REVIEWED PUBLICATIONS

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1. Schurmeier, L. R., Brouwer, G. E., Kay, J. P., Fagents, S.A, **Marusiak, A.G.**, Vance, S. “Impact Crater Relaxation Caused by An Insulating Methane Clathrate Crust on Titan” (submitted, PSJ)
 2. DellaGiustina, D.N., Ballouz, R.L., Walsh, K.J, **Marusiak, A.G.**, Bray, V.J, and Bailey, S.H. (2024) “Seismology of Rubble-pile Asteroids in Binary Systems” MNRAS
 3. **Marusiak, A.G.**, Tharimena, S., Panning, M.P., Stähler, S, Vance, S.D, Boehm, C., Van Driel, M. (2023) “Estimating the 3D structure of the Enceladus ice shell from flexural and Cray waves” EPSL, 603, 117984, <https://doi.org/10.1016/j.epsl.2022.117984>
 4. Fernando, B., Daubar, I., Irving, J., Johnson, C., **Marusiak, A.**, Baker, M., Stanley, S. (2022) “Inclusion of early-career researchers in space missions” Nature Communications. 6, 1339–1341, <https://doi.org/10.1038/s41550-022-01861-2>
 5. **Marusiak, A.G.**, Vance, S.D., Panning, M.P., Bryant, A., Hesse, M., Carnahan, E., Journaux, B. (2022) "The effects of methane clathrates on the thermal and seismic profile of Titan’s icy lithosphere". The Planetary Science Journal, 3 167, <https://doi.org/10.3847/PSJ/ac787e>
 6. **Marusiak, A.G.**, Panning, M.P, Vance, S.D, Nunn, C., Stähler, S., Tharimena, S. (2022) “Seismic detection of euroquakes originating from Europa's silicate interior” Earth and Space Science, 9, e2021EA002041. <https://doi.org/10.1029/2021EA002041>
 7. **Marusiak, A.G.**, N. C. Schmerr, B. Avenson, D. DellaGiustina, S. H. Bailey, V. J. Bray, ..., R. Weber (2022) The Detection of Seismicity on Icy Ocean Worlds by Single

- Station and Small-Aperture Seismometer Arrays. *Earth and Space Sciences*, 9, e2021EA002065. <https://doi.org/10.1029/2021EA002065>
8. **Marusiak, A. G.**, Vance, S., Panning, M.P., Běhounková M. , Byrne, P. K., C.G., Daswani, M. M., et al. (2021). “Exploration of Icy Ocean Worlds Using Geophysical Approaches.” *The Planetary Science Journal* 2 (4): 150. <https://doi.org/10.3847/PSJ/ac127>
 9. Stähler, S., Khan, A., Banerdt, B., Lognonne, P., ... **Marusiak, A.G.** ...Smrekar,S., (2021) Seismic Detection of the Martian Core. *Science* 448 (July): 443–48. <https://doi.org/10.1126/science.abi7730>
 10. R. Maguire, N. Schmerr, E. Pettit, K. Riverman, ... **Marusiak, A.G.** ...H. Bailey (2021) Constraints on the properties of a subglacial lake in northwest Greenland. *The Cryosphere*, 15, 3269-3291, doi: 10.5194/tc-15-3279-2021
 11. **Marusiak, A.G.**, N. C. Schmerr, D. DellaGiustina, B. Avenson, S. H. Bailey, V. J. Bray, ..., R. Weber (2021) The Deployment of the Seismometer to Investigate Ice and Ocean Structure (SIIOS) in Northwest Greenland: An Analog Experiment for Icy Ocean World Seismic Deployments. *Seismol. Res. Lett.*, doi: 10.1785/0220200291
 12. Moore, K., Courville, S., Ferguson, S., Schoenfeld, A., Llera, K., Agrawal, R., ... **Marusiak, A.**, ... Budney, C. (2021) Bridge to the stars: A mission concept to an interstellar object. *Planetary and Space Sciences*. doi:10.1016/j.pss.2020.105137
 13. **Marusiak, A.G.**, N.C. Schmerr, D. DellaGiustina, S. H. Bailey, V.J. Bray, E. Pettit, ... R. Weber (2020) The Deployment of the Seismometer to Investigate Ice and Ocean Structure (SIIOS) on Gulkana Glacier, Alaska. *Seismol. Res. Lett.*, 1–11, doi: 10.1785/0220190328
 14. **Marusiak, A.G.**, Schmerr, N.C., Banks, M.E., Daubar, I.J., (2020). Terrestrial Single-Station Analog for Constraining the Martian Core and Deep Interior: Implications for InSight. *Icarus* 335, 113396. doi:10.1016/j.icarus.2019.113396
 15. Panning, M. P, Pike, T., Lognonne, P., Banerdt W., Murdoch, N., ... **Marusiak, A.**, ...Warren, T., (2020) On-deck seismology: Lessons from InSight for future planetary seismology. *J. Geophys. Res. Planets*. doi: 10.1029/2019JE006353
 16. Nunn, C., Garcia, R., Nakamura, Y., **Marusiak, A. G.**, Kawamura, T., Sun, D., ... Zhu, P. (2020) Lunar Seismology: A Data and Instrumentation Review. *Space Sciences Review*. 216, 89 <https://doi.org/10.1007/s11214-020-00709-3>
 17. Garcia, R.F., Khan, A., Drilleau, M., Margerin, L., Kawamura, T., Sun, D., Wiczorek, M.A., ..., **Marusiak, A. G.**, ...Zhu, P. (2019) Lunar Seismology: An Update on Interior Structure Models. *Space Science Reviews*. 215:50 doi:10.1007/s11214-019-0613-y
 18. Mendillo, M., **A. G. Marusiak**, P. Withers, D. Morgan, and D. Gurnett (2013), A new semiempirical model of the peak electron density of the Martian ionosphere, *Geophys. Res. Lett.*, 40, 5361–5365, doi:[10.1002/2013GL057631](https://doi.org/10.1002/2013GL057631).
 19. Mendillo, M., C. Narvaez, and **A. G. Marusiak** (2013), Are ionospheric storms the same during different solar cycles? *J. Geophys. Res. Space Physics*, 118, 6795–6805, doi:[10.1002/2013JA019102](https://doi.org/10.1002/2013JA019102).

WHITE PAPERS AND TECHNICAL REPORTS

1. *Seismology Across the Solar System*. Article for the Centennial of the Deutsche Geophysikalische Gesellschaft e.V. (DGG). (2022). M. Knapmeyer, **A.G. Marusiak**, A. Horleston, B. Knapmeyer-Endrun, C. Nunn
2. *Distributed Geophysical Exploration of Ocean Worlds*. A White Paper for the NRC Planetary Science and Astrobiology Decadal Survey. (2020) S. D. Vance, M. Behounkova, B. G. Bills, O. Cadec, J. Castillo-Rogez, ... **A. G. Marusiak**, ... S. Wang. DOI: 10.3847/25c2cfef.a07234f4
3. *Planetary Seismology: The Solar System's Ocean Worlds*. A White Paper for the NRC Planetary Science and Astrobiology Decadal Survey. (2020) S. D. Vance, B. G. Bills, K. Hughson, T. Hurford, ... **A. G. Marusiak**, ... G. Tobie. DOI: 10.3847/25c2cfef.ca102d2f
4. *The scientific rationale for deployment of a long-lived geophysical network on the Moon*. R. Weber, C. N. Neal, R. Grimm, ... **A.G Marusiak**, ... M. Zuber. DOI: 10.3847/25c2cfef.674dcfdf
5. *Seismology on Artemis III: Exploration and Science Goals*. A White Paper for Artemis Science (2020) P. Lognonné, N. Schmerr, D. Antonangeli, S.H. Bailey, B. Banerdt, M.E. Banks ... **A.G. Marusiak** R. Yamada.

CONFERENCE ABSTRACTS

(1st author only, see [Google Scholar](#) for complete list)

1. **Marusiak, A.G.**, (2024) Flight-Ready Seismometers for the Moon and Beyond. *UASI Symposium 2024*
2. **Marusiak, A .G**, DellaGiustina, D., Bailey, S.H, ... Ballouz, R. (2023) Seismic Technology for Artemis Geophysical Station (STAGS): sensors to advance Artemis science objectives. *AGU Fall Meeting*
3. **Marusiak, A.G.**, Hopp, C., Kaven, J. O., Nakata, Robertson, M. (2022). Induced Seismicity Template Matching and Location Determination at Geothermal Monitoring Sites in Nevada. *AGU Fall Meeting*
4. **Marusiak, A.G**, Panning, M.P., Vance, S.D., Stähler,S., Tharimena, S. (2022) Detection of Seismic Events Originating From Europa's Silicate Interior: Implications for Interior Dynamics *AbSciCon*
5. **Marusiak, A.G**, Panning, M.P., Vance, S.D., Stähler,S., Tharimena, S. (2022) Detection of Seismic Events Originating From Europa's Silicate Interior *SSA Meeting*
6. **Marusiak, A.G**, Panning, M.P., Vance, A. Bryant, S.D., Carnahan E., Hesse, M.A., Journaux, B.R. (2022) Methane Clathrate Effects on Seismic Propagation Within Titan *LPSC LIII*
7. **Marusiak, A.G**, M. Baker, I.J Dauber, J. Irving, B. Fernando, S. Stanley, InSight DIWG, InSight's Diversity and Inclusion Working Group (2022), *LPSC LIII*
8. **Marusiak, A.G**, Panning, M.P., Vance, S.D., Stähler,S., Tharimena, S. (2021) Can a Seismometer Detect Events from Europa's Silicate Interior? Yes, if ... *AGU Fall Meeting*. doi:10.1002/essoar.10508980.1

9. **Marusiak, A.G.**, Panning, M.P., Vance, S.D., Carnahan E., Hesse, M.A., Journaux, B.R. (2021) Effects of Methane Clathrates on Thermal and Seismic Profiles *LPSC LII*, abstract 1151.
10. **Marusiak, A.G.**, Panning, M.P., Vance, S.D. (2020) The Influence and Detectability of Methane Clathrates on Seismic Velocity Structure: Applications to Titan and Icy Ocean Worlds. *AGU Fall Meeting*.
11. **Marusiak, A.G.**, Schmerr N.C, Avenson, B., Bailey, S. H., Bray, V. J., DellaGiustina, D. N., ... Weber, R. C. (2020). Cluster Analysis of Thermal Icequakes Using using the Seismometer to Investigate Ice and Ocean Structure (SIIOS): Implications for Ocean World Seismology, *LPSC LI*, Abstract 1424.
12. **Marusiak, A.G.**, Schmerr, N. C., Bailey, H., DellaGiustina, D., Bray, V. J., Weber, R., ... Wagner N.(2019). Ambient Seismicity on European Analogs using the Seismometer to Investigate Ice and Ocean Structure (SIIOS). *AGU Fall Meeting*.
13. **Marusiak, A. G.**, Schmerr, N. C., Bailey, S. H., Dellagiustina, D. N., Bray, V. J., Dahl, P., ... Weber, R. C. (2019). Location of Seismicity with a Small Aperture Seismometer Array: Implications for Seismology with an Ocean World Lander. In *50th LPSC*. Woodlands, TX, Abstract 1546.
14. **Marusiak, A. G.**, Schmerr, N., DellaGiustina, D., Bailey, H., Bray, V., Broadbeck, J., ... Avenson, B. (2018). The Seismometer to Investigate Ice and Ocean Structure (SIIOS) in Greenland: Testing Instrument Performance on an Icy World Analog. *AGU Fall Meeting*. Washington D.C
15. **Marusiak, A.G.**, Schmerr, N.C., Weber, R.C., DellaGiustina, D.N., Bailey, S.H., Bray, V.J., ... Siegler, M., (2018). SIIOS In Alaska- Active Source Compartitive Test for an Europa Lander Seismometer, *LPSCXLVIX*, Houston. TX. Abstract 2478.
16. **Marusiak, A.G.**, Schmerr, N.C., Banks, M.E., Daubar, I.J., (2017). Terrestrial Single-Station Analog for Constraining the Martian Interior, *LPSCXLVIII*, Houston. TX. Abstract 2294.
17. **Marusiak, A.G.**, Schmerr, N.C., Banks, M.E., Daubar, I.J., (2016). Terrestrial Single-Station Analog for the Detection of the Martian Core, *LPSCXLVII*, Houston. TX. Abstract 2010.

Funding

Co-I of *LEMS* for Artemis 3 Deployed Instruments Program

- \$25 million total, approx. \$2,902,655 to UA with \$670,000 IDC
- April 2024-Dec 2026

REFERENCES

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Associate Professor, University of Maryland
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Mark Panning
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Postdoc Advisor
Phone: 818-354-1575
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