Melissa D. Cashion, PhD

curriculum vitae

Postdoctoral Research Scholar – advised by Prof. Sarah Stewart
School of Earth and Space Exploration, Arizona State University
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EDUCATION

Ph.D. Planetary Science, "Formation and evolution of outer solar system components"
Purdue University (2024) – Advised by Prof. Brandon Johnson

B.A. Physics (cum laude) with astrophysics and mathematics minors
Texas A&M University (2020)

RESEARCH AND TEACHING EXPERIENCE

Guest lecture, *Impact Cratering: Contact and Compression*, Purdue University (September 2023)

Undergraduate research mentor, Purdue University: Josuan Vega (Fall 2023 – Spring 2024), Eva Veeningen (Fall 2023), John Herring (Spring 2023)

Teaching Assistant, *Introduction to Oceanography,* Purdue University (Autumn 2021)

CIERA Research Experience for Undergraduates, *The Evolution of Planetary Systems in Dense Star Clusters*, Northwestern University (June 2019 – Aug. 2019)

Undergraduate Research Assistant, *Statistical modeling of galactic stellar kinematics*, Texas A&M University (Jan. 2018 – June 2019)

AWARDS

Outstanding Graduate Student (2024)

Wolfram technologies staff pick: Europa's Double Ridges Produced by Ice Wedging (2024)

O. Richard Norton Fund travel award (2022)

Best 3-minute talk runner-up (2022)

INVITED TALKS

New Mexico Tech University (2026). Impact vapor plumes and nebular shocks in the protoplanetary disk.
Brown University (2024). Chondrule formation indicates protracted growth of giant planet cores.
Southwest Research Institute (2022). Chondrules as byproducts of giant planet formation.

PUBLICATIONS

Cashion, M. D., Johnson, B. C., Walsh, K., Deienno R., Kretke, K., Krot, A. N. (2025) Chondrule formation indicates protracted growth of giant planet cores. *Icarus,* 429, 116400.

Cashion, M. D., Johnson, B. C., Gibson, H., Turtle, E. P., Sori, M. M. and Melosh, H. J. (2024) Europa's Double Ridges Produced by Ice Wedging. *Journal of Geophysical Research: Planets.*

Cashion, M. D., Johnson, B. C., Krot, A. N., Kretke, K. A., Wakita, S. and Davison, T. M. (2022) Chondrule formation via impact jetting in the icy outer solar system. *Icarus*, 384, p.115110.

Krot, A. N., Petaev, M. I., Nagashima, K., Dobrică, E., Johnson, B. C. and **Cashion, M. D**. (2022) Impact plume-formed and protoplanetary disk high-temperature components in CB and CH metal-rich carbonaceous chondrites. *Meteoritics & Planetary Science*, 57(2), pp.352-380.

ABSTRACTS

Cashion, M. D. and Stewart S. T. (2026), Development of the IVANS model for chondrule formation: modeling vaporization of ice-rock mixtures, 57th Lunar and Planetary Science Conference, The Woodlands, TX.

Cashion, M. D. and Stewart S. T. (2025), Thermal Processing of Material During Mutual Planetesimal Collisions, 56th Lunar and Planetary Science Conference, The Woodlands, TX.

Cashion, M. D., Johnson, B. C., Deienno, R., Kretke, K., Walsh, K., Krot, A. N., (2024) The protracted growth of giant planet cores as indicated by chondrule formation, 55th Lunar and Planetary Science Conference, The Woodlands, TX.

Cashion, M. D., Johnson, B. C., Deienno, R., Kretke, K., Walsh, K. (2023) Chondrules: A Consequence of Giant Planet Accretion (poster), Gordon Research Conference: Origins of Solar Systems, South Hadley, MA.

Cashion, M. D., Johnson, B. C., Sori, M. M., Gibson, H., Turtle, E. P. (2023) An Ice Wedging Origin for Europa's Double Ridges, 54th Lunar and Planetary Science Conference, The Woodlands, TX.

Cashion, M. D., Johnson, B. C., Deienno, R., Walsh, K. J., Krot, A. N. (2022) Chondrules as Byproducts of Giant Planet Formation, 85th Annual Meeting of The Meteoritical Society, Glasgow, Scotland.

Krot, A. N., Nagashima, K., Ivanova, M. A., Humayun, M., Libourel, G., Johnson, B. C., **Cashion, M. D**., Bizzarro, M. (2022) Oxygen Isotopic Compositions of Minerals in Chondritic and Achondritic Lithologies of the CB Carbonaceous Chondrite Sierra Gorda 013, 85th Annual Meeting of The Meteoritical Society, Glasgow, Scotland.

Krot, A. N., Nagashima, K., Ivanova, M. A., Lauretta, D. S., Libourel, G., Johnson, B. C., **Cashion, M. D.**, Bizzarro, M. (2022) Oxygen-Isotope Compositions of Chondrules in Metal-Rich Carbonaceous Chondrites Fountain Hills and Sierra Gorda 013, 53nd Lunar and Planetary Science Conference, The Woodlands, TX.

Cashion, M. D., Johnson, B. C., Wakita, S., Davison, T., Krot, A. N., Kretke, K., Walsh, K. (2021) Producing Chondrules in the Outer Solar System: The Effect of Ice on Impact Jetting, 52nd Lunar and Planetary Science Conference, remote.

Cashion, M. D., Kremer, K., Spera, M., Rasio, F. (2020), The Evolution of Planetary Systems in Dense Star Clusters, 235th American Astronomical Society Meeting, Honolulu, HI.

Sharp, H., **Cashion, M. D.,** Walsh, J., Barth, A. J., Shields, J., Sarzi, M. (2020) Stellar Kinematics of NGC 4203, 235th American Astronomical Society Meeting, Honolulu, HI.

Cashion, M. D. (2019) The History of Planets in Dense Star Clusters (poster), Adler Planetarium, Chicago, IL & Northwestern University, Evanston, IL.