

Emilie T. Dunham
etdunham@g.ucla.edu

51 Pegasi b Postdoctoral Fellow at UCLA
Earth, Planetary, and Space Science (EPSS)
<https://sites.google.com/asu.edu/etdunham/home>

UCLA EPSS
595 Charles E. Young Dr
LA, CA 90095

EDUCATION

Ph.D. Degree in Geosciences Aug. 2014 – May 2020
Arizona State University, School of Earth and Space Exploration, Tempe AZ

B.S. Degree in Astronomy, Minors: Physics and Geology Aug. 2010 – May 2014
Case Western Reserve University (CWRU), Cleveland OH

GRANTS AND AWARDS

51 Pegasi b Postdoctoral Fellowship	2020 – 2023
NASA Earth and Space Science Fellowship (\$30,000 per year)	2016 – 2019
O. Richard Norton Award, 82nd Meteoritical Society Meeting (\$1,700)	2019
ASU College of Liberal Arts and Sciences Graduate Excellence Award	2018
Brian Mason Award for conference abstract, IMCA (\$1,500)	2017

RESEARCH EXPERIENCE

UCLA: Earth, Planetary, and Space Sciences (LA, CA)

51 Pegasi b fellow (2020 – present)

- Discovered new Calcium- Aluminum- rich inclusions (CAIs) in meteorites by x-ray mapping of ordinary and enstatite chondrites.
- Performed petrographic and isotopic analyses on CAIs to constrain Solar System formation.

ASU: School of Earth and Space Exploration (Tempe, AZ)

NESSF graduate student with Dr. Meenakshi Wadhwa (2014 – 2020)

- Conducted REE geochemistry measurements using secondary ion mass spectrometry (SIMS) of martian meteorite shergottites LAR 12095, LAR 12240, and LAR 12011.
- Measured the Be-B, Al-Mg, and oxygen isotope systems in primitive meteorite CAIs from CV3, CR2, CO3, CR2, and CH/CB carbonaceous chondrites utilizing SIMS in order to better understand the astrophysical birth environment of our Solar System.

Research assistant with Dr. Steven Desch (2014 – 2019)

- Modeled the Kuiper Belt Object (KBO) Haumea using an algorithm by Hachisu (1986) in order to constrain its shape and predict its composition.

Classification of meteorites (2017 – 2019)

[NWA 10918](#) (CV3), [NWA 11970](#) (Lodranite), [NWA 12282](#) (Eucrite), [NWA 12281](#) (LL3)

- Conducted EPMA work to write Meteoritical Bulletin characterization.

TEACHING AND MENTORING EXPERIENCE

- *Fall 2020 - Science Research Mentoring Program:* Mentor (virtually) three Boston area high school students for 7 months to research meteorites and present their findings [SRMP](#)
- *Fall 2018 - Cosmochemistry and Meteorites class mentor:* Mentor graduate students through a class project classifying a meteorite (taught by Prof. Meenakshi Wadhwa).
- *2016-2019 - Sundial Project, ASU:* Mentor through research and provide career development advice to ASU physics/astronomy/geology undergraduates. Mentored ten individuals and created two semester-long research projects (one where four students are authors of the Meteoritical Bulletin publication [NWA 11970](#)).

- 2015-2016 - Teaching Assistant, ASU: Introductory geology lab class (3 labs per week, 120 total students), SESE.

ARTICLES and BLOGS

Meteorite Times Magazine article: [Understanding Solar System History: CAIs in Meteorites](#)

51 Pegasi b fellowship announcement: [2020 51 Pegasi b Emilie Dunham](#)

Graduate Student highlight: [ASU Spring 2020 graduates](#)

Led the Antarctic Search For Meteorites 2020 blog: [ANSMET blog](#)

PUBLIC SERVICE

-Collected meteorites in Antarctica as part of the 2020 Antarctica Search for Meteorites Team

-Invited Talks

- UCLA EPSS Geocheminar seminar presentation – “Meteoritic evidence for a molecular cloud origin of short-lived radionuclide ^{10}Be ” (February 2021).
- LPI Seminar presentation – “Meteoritic Implications for the Galactic Environment of Solar System Formation” (December 2020).
- ASU Center For Meteorite Studies seminar presentation – “ANSMET field season 2019-2020 recap” (May, 2020).
- UCLA EPSS cosmochemistry seminar presentation – “Meteoritic Implications for the Galactic Environment of Solar System Formation” (November, 2019)
- Phoenix Astronomy Society public lecture – “Events in the Solar System from the solar nebula to Mars to the Kuiper Belt” (February, 2018).
- Girls Rule Foundation, Wings to Fly Summer Camp – presentation focused on empowering girls to pursue science and activities with meteorites (June, 2017).

-ASU Center for Meteorite Studies Volunteer Outreach

- Organize the Center for Meteorite Studies outreach booth at SESE Monthly Open House (2014 – present)
- Earth and Space Exploration Day (October 2014 – 2017)
- Homecoming meteorite booth (November 2014, 2017, 2018)
- Night of the Open Door (April 2015, 2016, 2018)
- Events (PI day and Girl Scout day) at Arizona Natural History Museum, Mesa, AZ (2015, 2016)
- Phoenix Comi-Con (June 2015, 2016, 2017), member of two panels: meteorites and women in science (2017)
- Poston Jr. High School Astronomy Night, Mesa, AZ (December, 2015)

-Volunteering

- Cleveland Museum of Natural History, Cleveland, OH: presented planetarium shows, operated telescopes to show the night sky to the public, fixed the star dome (Fall 2012 – Spring 2014)

TECHNICAL SKILLS

- Sample preparation including cutting, mounting, polishing, and cleaning of meteorites
- Telescope observation
- 5 years experience of secondary ion mass spectrometry (SIMS)
- 5 years experience of scanning electron microscope (SEM) and electron microprobe (EMPA)
- Experience using a DeLtech high temperature furnace to make homogeneous glass standards
- Matlab (astrophysical modeling, data reduction), Microsoft products, Illustrator

PEER-REVIEWED PUBLICATIONS

Dunham E.T., Wadhwa M., Desch S.J., Hervig R.L. 2020. Best Practices for Determination of Initial $^{10}\text{Be}/^9\text{Be}$ in Early Solar System Materials by Secondary Ion Mass Spectrometry
Geostandards and Geoanalytical Research 12329.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/ggr.12329>

S. Jarmak, E. Leonard, L. Schurmeier, A. Akins, E. Dahl, D. R. Cremons, S. Cofield, A. Curtis, C. Dong, **E. T. Dunham**, B. Journaux, D. Murakami, W. Ng, M. Piquette, A. Pradeepkumar Girija, K. Rink, N. Stein, N. Tallarida, M. Telus, L. Lowes, C. Budney, K. L. Mitchell. 2019. QUEST: A New Frontiers Uranus Orbiter Mission Concept Study. *Acta Astronautica* submitted.

<https://www.sciencedirect.com/science/article/abs/pii/S0094576520300412>

- Dunham E.T.**, Desch S.J., Probst, L. 2019. Haumea's Shape, Composition, and Internal Structure. *The Astrophysical Journal* 877: 41. <https://iopscience.iop.org/article/10.3847/1538-4357/ab13b3/meta>
- Dunham E.**, Balta B., Wadhwa M., Sharp T.G., McSween H.Y. 2019. Petrology and geochemistry of olivine-phyric shergottites LAR 12095 and LAR 12240: Implications for their petrogenetic history on Mars. *Meteoritics and Planetary Science* 13262:1-25. <https://onlinelibrary.wiley.com/doi/10.1111/maps.13262>
- Dunham E.**, Kosiarek M., Markatou E.A., Wang A. 2014. Limits of astrometric and photometric precision on KBOs. *Publications of the Astronomical Society of the Pacific* 126: 863-867. https://www.jstor.org/stable/10.1086/678328?seq=3#metadata_info_tab_contents

SELECTED CONFERENCE ABSTRACTS

- Dunham E.T.**, Liu M.-C., Herwig A.T., Desch, S.J., Wadhwa M. 2019. CO3 and CH/CB CAIs suggest ^{10}Be was distributed uniformly in the solar nebula (abstract#6346). 82nd *Meteoritics & Planetary Science*.
- Dunham E.T.**, Wadhwa M., Liu M.-C., Herwig A.T., Kita N., Fukuda K., Schrader D.L., Davidson J. 2018. Pristine CR2 CAIs preserve initial abundances of short-lived radionuclides ^{10}Be and ^{26}Al (abstract#1928). 50th *Lunar and Planetary Science Conference*.
- Dunham E.T.**, Liu M.-C., Simon S.B., Krot A.N., Wadhwa M. 2018. Beryllium-Boron systematics of ^{26}Al -poor CAIs: Implications for the relationship between FUN and non-FUN CAIs (abstract#2402). 49th *Lunar and Planetary Science Conference*.
- Dunham E.**, Wadhwa M., Liu M.-C. 2017. The range of initial $^{10}\text{Be}/^{9}\text{Be}$ ratios in the early Solar System: a re-assessment based on analyses of new CAIs and melilite composition glass standards. (abstract #6381). 80th *Meteoritics & Planetary Science*.
- Dunham E.**, Desch S.J., Perera V., Schwartz S. 2017. Modeling the axis ratios of a differentiated Haumea to determine its internal structure (abstract#2438). 48th *Lunar and Planetary Science Conference*.
- Dunham E.**, Wadhwa M., Simon, S., Grossman, L. 2016. Beryllium-Boron Systematics of Refractory Inclusions in CR2 and CV3 Chondrites: Evidence for ^{10}Be Heterogeneity (abstract #6222). 79th *Meteoritics & Planetary Science*.