

Carolyn A. Crow

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Research Interests

Investigating the evolution of terrestrial planet crusts through analyses of planetary materials.
Understanding the influences of the space environment and impact bombardment on mineral structures and geochemical signatures recorded in samples from Moon, Mars, Earth, and other planetary bodies.

Education

Ph. D.	Geochemistry, University of California, Los Angeles Dissertation: “The Early Lunar Magmatic and Impact Histories Recorded in Apollo Zircons”	2015
M. S.	Geochemistry, University of California, Los Angeles	2012
B. S.	Astronomy, University of Maryland	2008

Professional Experience

Assistant Professor <i>University of Colorado Boulder</i>	2020 - Present
Research Associate <i>University of Colorado Boulder</i>	2018 - 2020
Postdoctoral Research Staff Member <i>Lawrence Livermore National Laboratory (Noble Gas Lab, NanoSIMS Laboratory)</i>	2015 - 2017
Graduate Research Assistant <i>University of California, Los Angeles (SIMS Laboratory)</i>	2011 - 2015
Research Assistant <i>Astronomy Department, University of Maryland</i>	2009 - 2010

Publications

Anderson F. S., **Crow C. A.**, Levine J., and Whitaker T. J. (*In Review*) Pb-Pb Dating of Terrestrial and Extraterrestrial Samples Using Resonance Ionization Mass Spectrometry. *Earth and Space Science*.

Crow C. A., Crowther S. A., McKeegan K. D., Turner G., Busemann H., and Gilmour J. D. (2020) Xenon systematics of individual lunar zircons, a new window on the history of the lunar surface. *Geochimica et Cosmochimica Acta*, 286, 103-118.

Crow C. A., Moser D. E., and McKeegan K. D. (2019). Shock Metamorphic History of >4Ga Apollo 14 and 15 Zircons. *Meteoritics and Planetary Science*, 54, 181-201.

Cassata W. S., Cohen B. E., Marks D. F., Trappitsch R., **Crow C. A.**, and Wimpenny J. (2018). The chronology of Martian breccia NWA 7034 and implications for the formation of the Martian crustal dichotomy. *Science Advances*, 4, eaap8306.

Crow C. A., McKeegan K. D. and Moser D. E. (2017) Coordinated U-Pb Geochronology, Trace Elements, Ti-in-Zircon Thermometry and Microstructural Analyses of Apollo Zircons. *Geochimica et Cosmochimica Acta*, 202, 264-284.

McFadden L. A., Bastien F. A., Mutchler M., **Crow C. A.**, Weir H., Li J.-L. and Hamilton D. P. (2012) Search for Satellites of Vesta: Upper Limits on Their Size. *Icarus*, 220, 305-310.

Crow C. A., McFadden L. A., Robinson T., Meadows V., Livengood T. A., Hewagama T., Barry R. K., Deming L. D., Lisse C. M. and Wellnitz, D. (2011). Views from EPOXI: Colors in our Solar System as an Analog for Extrasolar Planets. *Astrophys. J.*, 729, 130-140.

Selected Conference Abstracts:

Crow C. A., Han J., Keller L., and Moser D. E. (2018) TEM Analyses of Novel Lunar Zircon Shock Microstructures. Goldschmidt Abstract #500

Crow C. A., McKeegan K. D., and Moser D. E. (2017) Lunar Zircons: Probing the Moon's Early History. Goldschmidt Abstract #787

Crow C. A., Cassata W. S., Jolliff B. L., Zeigler R. A., Borg L. E. and Shearer C. K. (2017) Ar-Ar Thermochronology of Apollo 12 Impact-Melt Breccia 12033,638-1. Lunar and Planetary Sciences Conference #2823

Crow C. A., Jacobsen B., Moser D. E. and McKeegan K. D. (2016) U-Pb Dating of Zircon Shock Microstructures with NanoSIMS. Goldschmidt Abstract #566 [**Invited**]

Crow C. A., Crowther S. A., Gilmour J. D., Busemann H., Moser D. E. and McKeegan K. D. (2015) U-Xe Degassing Ages of Terrestrial and Lunar Impact Zircons. 78th Annual Meeting of the Meteoritical Society. # 5226 [McKay Award]

Crow C. A., Moser D. E., McKeegan K. D. and Barker I. (2014) Impact Shock Microstructures in Apollo 14 Zircons. 77th Meteoritical Society Meeting. #5366 [Wiley-Blackwell Award]

Current Grants

PI: Carolyn Crow

Co-PIs: Rebecca Flowers (CU Boulder), Rita Economos (SMU), Maryjo Brounce (UC Riverside), Jeremy Boyce (NASA-JSC), Timmons Erickson (NASA-JSC).

Collaborators: James Metcalf (CU Boulder), Kevin McKeegan (UCLA), Blair Schoene (Princeton), Edward Garboczi (NIST Boulder)

Title: *Building a Global Record of Lunar Magmatism and Impact Processes: A Consortium Study of Apollo Regolith Apatite.*

Funding Agency: NASA Solar System Workings.

Total Budget: \$899,561

PI: Carolyn Crow

Co-PIs: Richard Noble (Chemical Engineering, CU Boulder), Moises Carreon (Colorado School of Mines) Title: Investigating Noble Gas Adsorption Properties of Microporous Materials: Improving Systems for Detection of Underground Nuclear Explosions.

Funding Program: University of Colorado Seed Grant.

Total Budget: \$49,810

PI: Dr. Jessica Barnes.

Co-PIs: **Carolyn Crow** (CU Boulder), Jeremy Boyce (NASA-JSC), Maryjo Brounce (UC Riverside), Jed Mosenfelder (U of Minnesota), Thomas Zega (U of A)

Collaborators: Scott Messenger (NASA-JSC)

Title: *A Multifaceted Approach to Investigating the Magmatic and Post-Magmatic History of Volatiles in Basalts from the Rim of Steno Crater.*

Funding Program: NASA Apollo Next Generation Sample Analysis Program.

CU Subcontract: \$39,871

Awards

CU Boulder UROP Mentor of the Year (<i>Honorable Mention</i>)	2019
LLNL Postdoctoral Poster Award	2017
Meteoritical Society McKay Award	2015
Meteoritical Society Wiley-Blackwell Award	2014
NASA Earth and Space Sciences Fellowship	2012-2015
Lunar and Planetary Institute Career Development Award	2012
UCLA Departmental Teaching Award	2012

Recent Invited Talks

Southwest Research Institute - <i>Colloquium</i> <i>Boulder, CO</i>	<i>Oct. 9, 2018</i>
University of Toronto, Department of Earth Sciences – <i>Colloquium</i> <i>Toronto, Canada</i>	<i>March 14, 2019</i>
York University, ESSE Department – <i>Special Seminar</i> <i>Toronto, Canada</i>	<i>March 12, 2019</i>
Lunar and Planetary Institute – <i>LPI Seminar</i> <i>Houston, TX</i>	<i>April 4, 2019</i>
Colorado State University, Dept. of Geological Sciences – <i>Colloquium</i> <i>Fort Collins, CO</i>	<i>May 2, 2019</i>

Teaching Experience, Mentoring, and Outreach

GLEE (Great Lunar Expedition for Everyone) <i>Proposed mission by the Colorado Space Grant and CU Chair of Science Advisory Board</i>	<i>Fall 2019-Present</i>
GEOL4330/ASTR4330 Cosmochemistry (CU Boulder) <i>Instructor on Record</i>	<i>Fall 2019</i>

GEOL5835/ASTR5835 Planetary Seminar (CU Boulder) <i>Co-Taught with Prof. Brian Hynek</i> <i>Using Earth to Understand the Planets</i>	<i>Fall 2018</i>
GEOL5150 Planetary Field Geology (CU Boulder) <i>Co-Taught with Prof. Brian Hynek</i>	<i>Spring 2018</i>
CU UROP Grant Mentor <i>Evan Tucker (Geology Undergraduate)</i> <i>Cynthia Tong (Geology Undergraduate)</i>	<i>F2018-S2019</i> <i>Sum2019-Present</i>
Other Student Mentees <i>Anthony Green (Geology Undergraduate, Supported by Seed Grant)</i>	<i>F2019 - Present</i>
Program Director & Curriculum Lead <i>Ad Astra Academy (adastra.world)</i>	<i>2015 - Present</i>
Teaching Assistant (UCLA) <i>Earthquakes; Solar System and Planets</i>	<i>2010 & 2012</i>
NASA Dawn Mission EPO Team Member	<i>2009 - 2010</i>
Teaching Assistant (UMD) <i>Introduction to Astronomy</i>	<i>2008 - 2009</i>

Professional Service Activities

NASA Curation and Analysis Planning Team for Extraterrestrial Materials (CAPTEM) <i>Lunar Subcommittee</i>	<i>2018 -2021</i>
Manuscript Reviews <i>Geology, Geochimica et Cosmochimica Acta, Meteoritics and Planetary Science</i>	
NASA Review Panel Member	<i>2018</i>
Organizer of <i>Planetary Lunch</i> at CU Boulder	<i>F2018-S2019</i>