William S. Cassata, Ph.D.

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Education

2007–2012 **Ph.D.**, *The University of California at Berkeley*
Earth & Planetary Science

2003–2007 **B.S.**, *The University of Wisconsin at Madison*
Geology & Geophysics

Prior Appointments

2012–2013 **Post-doctoral Research Staff**, *Lawrence Livermore National Laboratory*, Nuclear & Chemical Sciences Division.

2012 **Post-doctoral Research Fellow**, *Berkeley Geochronology Center*

2009–2012 **Graduate Teaching Assistant**, *The University of California at Berkeley*

2007–2012 **Graduate Research Assistant**, *The University of California at Berkeley*

2004–2007 **Undergraduate Research Assistant**, *The University of Wisconsin at Madison*

Selected Honors

2014 **Defense Programs Award of Excellence** for Significant Contributions to the Stockpile Stewardship Program

2014 **LLNL Director's Science & Technology Award** for the Radiochemical Analysis of Gaseous Species for Diagnostics at the National Ignition Facility

2014 **LLNL Directorate Award for Scientific & Technical Achievement** for Noble Gas Analyses of Nuclear Fallout

2009–2012 **National Science Foundation Graduate Research Fellow**

Publications

Peer-reviewed articles

2016

[26] Gaffney, A., Marks, N., Knight, K.B., Kristo, M.J., Cassata, W.S., and Hutcheon, I.D., 2016, Analysis of nuclear material out of regulatory control, *Annual Reviews in Earth and Planetary Science*, in press.

[25] Cassata, W.S., Velsko, C.A., Stoeffl, W., Jedlovec, D.R., Golod, A.B., Shaughnessy, D.A., Yeamans, C.B., Edwards, E.R., and Schneider, D.H.G, 2016, Determination of gaseous fission product yields from 14 MeV neutron induced fission of ^{238}U at the National Ignition Facility, *Journal of Radioanalytical and Nuclear Chemistry* DOI 10.1007/s10967-015-4662-8.

2015

[24] Shuster, D.L., and Cassata, W.S., 2015, Paleotemperatures at the lunar surfaces from open system behavior of cosmogenic ^{38}Ar and radiogenic ^{40}Ar, *Geochimica et Cosmochimica Acta* 155, 154-171.

[23] Cassata, W.S., and Renne, P.R., 2015, Reply to the comment of Lovera et al. (2015) on "Systematic variations of argon diffusion in feldspars and implications for thermochronometry" by Cassata and Renne, *Geochimica et Cosmochimica Acta* 157, 228-232.

2014

[22] Cassata, W.S., Prussin, S., Knight, K.B., Isselhardt, B., Hutcheon, I.D., and Renne, P.R., 2014, When the dust settles: Applications of stable xenon isotopes to the formation of nuclear fallout, *Journal of Environmental Radioactivity* 137, 88-95.

[21] Tikoo, S.M., Weiss, B.P., Cassata, W.S., Shuster, D.L., Gattacceca, J., Lima, E.A., Suavet, C., Nimmo, F., and Fuller, M.D., 2014, Decline of the lunar core dynamo, *Earth and Planetary Science Letters* 404, 89-97.

[20] Cassata, W.S., 2014, *In situ* dating on Mars: A new approach to the K-Ar method utilizing cosmogenic argon, *Acta Astronautica* 94, 222-233.

[19] Iorio, M., Liddicoat, J., Budillon, F., Incoronato, A., Coe, R.S., Insinga, D.D., Cassata, W.S., Lubritto, C., Angelino, A., Tamburrino, S., 2014, Combined paleomagnetic secular variation and petrophysical records to time-constrain geological and hazardous events: An example from the eastern Tyrrehian Sea over the last 120 ka, *Global and Planetary Change* 113, 91-109.

[18] Negrini, R.M., McCuan, D., Horton, R., Lopez, J., Cassata, W.S., Channell, J.E., Verosub, K.L., Knott, J.R., Coe, R.S., Liddicoat, J.C., Lund, S., Benson, L.V., and Sarna-Wojcicki, A., 2014, Nongeocentric axial dipole field behavior during the Mono Lake Excursion, *Journal of Geophysical Research - Solid Earth* 119, doi:10.1002/2013JB010846.

2013

[17] Suavet, C., Weiss, B.P., Cassata, W.S., Shuster, D.L., Gattacceca, J., Chan, L., Garrick-Bethell, I., Head, J.W., Grove, T.L., and Fuller, M.D., 2013, Persistence and origin of the lunar core dynamo, *Proceedings of the National Academy of Sciences* 110, 8453-8458.

[16] Cassata, W.S., and Renne, P.R., 2013, Systematic variations of argon diffusion in feldspars and implications for thermochronometry, *Geochimica et Cosmochimica Acta* 112, 251-287.

[15] Cassata, W.S., and Renne, P.R., 2013, Kinetics of argon diffusion in calcite, *Chemie der Erde* 73, 113-115.

2012

[14] Cassata, W.S., Shuster, D.L., Renne, P.R., and Weiss, B.P., 2012, Trapped Ar isotopes in meteorite ALH 84001 indicate Mars did not have a thick ancient atmosphere, *Icarus* 221, 461-465.

[13] Shea, E.K., Weiss, B.P., Cassata, W.S., Shuster, D.L., Tikoo, S.M., Gattacceca, J., Grove, T.L., and Fuller, M., 2012, A long-lived lunar core dynamo, *Science* 335, 453-456.

[12] Gourbet, L., Shuster, D.L., Balco, G., Cassata, W.S., Rood, D., and Renne, P.R., 2012, Neon diffusion kinetics in olivine, pyroxene, and feldspar: Retentivity of cosmogenic and nucleogenic neon, *Geochimica et Cosmochimica Acta* 86, 21-36.

[11] Renne, P.R., Mulcahy, S.R., Cassata, W.S., and Morgan, L.E., 2012, Retention of inherited argon in alkali feldspar xenocrysts: Constraints from Ba diffusion profiles, *Geochimica et Cosmochimica Acta* 93, 129-142.

[10] Cassata, W.S., and Renne, P.R., 2012, Fossil raindrops and ancient air, *Nature* 484, 322-324.

2011

[9] Cassata, W.S., 2011, An isochron approach to ^{21}Ne cosmic ray exposure dating by activation with deuteron-deuteron fusion neutrons, *Chemical Geology* 284, 21-25.

[8] Cassata, W.S., Renne, P.R., and Shuster, D.L., 2011, Argon diffusion in pyroxenes: Implications for thermochronometry and mantle degassing, *Earth and Planetary Science Letters* 304, 407-416.

[7] Huber, C., Cassata, W.S., and Renne, P.R., 2011, A lattice Boltzmann model for noble gas diffusion in solids: The importance of domain shape and diffusive anisotropy and implications for thermochronometry, *Geochimica et Cosmochimica Acta* 75, 2170-2186.

2010

[6] Cassata, W.S., Shuster, D.L., Renne, P.R., and Weiss, B.P., 2010, Evidence for shock heating and constraints on Martian surface temperatures revealed by ^{40}Ar/^{39}Ar thermochronometry of Martian meteorites, *Geochimica et Cosmochimica Acta* 74, 6900-6920.

[5] Cassata, W.S., Singer, B.S., Liddicoat, J., and Coe, R., 2010, Reconciling discrepant chronologies for the geomagnetic excursion at Mono Lake: Insights from new $^{40}Ar/^{39}Ar$ dating experiments and a revised paleointensity correlation, *Quaternary Geochronology* 5, 533-543.

[4] Shuster, D.L., Balco, G., Cassata, W.S., Fernandes, V.A., Garrick-Bethell, I., and Weiss, B.P., 2010, A record of impacts preserved in the lunar regolith, *Earth & Planetary Science Letters* 290, 155-165.

2009

[3] Cassata, W.S., Renne, P.R., and Shuster, D.L., 2009, Argon diffusion in plagioclase and implications for thermochronometry: A case study from the Bushveld Complex, South Africa, *Geochimica et Cosmochimica Acta* 73, 6600-6612.

[2] Renne, P.R., Cassata, W.S., and Morgan, L., 2009, The isotopic composition of atmospheric argon and $^{40}Ar/^{39}Ar$ geochronology: Time for a change? *Quaternary Geochronology* 4, 288-298.

2008

[1] Cassata, W.S., Singer, B.S., and Cassidy, J., 2008, Laschamp and Mono Lake geomagnetic excursions recorded in New Zealand, *Earth and Planetary Science Letters* 268, 76-88.

Teaching and Mentorship

Post-doctoral Advisor (LLNL)

2015-present **Carolyn Crow** (UCLA Ph.D., cosmochemistry, nuclear forensics)

2013-present **Sean Gates** (Stanford Ph.D., nuclear forensics)

Courses and Field Trips (UC-Berkeley)

2012 **EPS100B: Genesis and interpretation of rocks** (TA)

2011 **EPS100B: Genesis and interpretation of rocks** (TA)

2011 **EPS119: Geologic Field Studies – Klamath Mountains** (Field Asst.)

2010 **EPS100B: Genesis and interpretation of rocks** (TA)

2011 **EPS119: Geologic Field Studies – Bishop, CA** (Field Asst.)

2009 **EPS150: Case studies in Earth systems** (Grader/Asst.)

Professional Service

Referee (1) *NASA LASER Program*, (2) *Nature*, (3) *Geochimica et Cosmochimica Acta*, (4) *Earth & Planetary Science Letters,* (5) *Quaternary Geochronology,* (6) *Proceedings of the Geological Society of London*, (7) *NSF Petrology and Geochemistry Program*, (8) *Geology*, and (9) *Tectonophysics*