

## Clark M. Johnson

Vilas Distinguished Professor

Department of Geoscience

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University of Wisconsin-Madison

Madison, WI 53706

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### Education:

6/86	Ph.D.	Stanford University, Geology
4/84	M.S.	Stanford University, Geology
8/81	B.S.	University of California at Davis, Geology with Honors
10/76-8/79		Foothill College, Los Altos, CA

### Professional Positions:

6/96-present	Professor, University of Wisconsin at Madison
6/91-5/96	Associate Professor, University of Wisconsin at Madison
10/94-5/95	Visiting Scholar, Carnegie Institution of Washington, Dept. Terrestrial Magnetism
1/87-5/91	Assistant Professor, University of Wisconsin at Madison
2/82-12/86	Research Geologist, U.S. Geological Survey, Menlo Park

### Education Summary:

Through Fall 2018, taught 46 introductory-level courses, 24 intermediate-level majors courses, 31 advanced majors/graduate courses, and 50 field/seminars/special study sections, involving ~8,500 students. Received five teaching awards. Teaching evaluations consistently ranked in top quartile. Advised 8 undergraduate research interns and theses (7 as primary advisor), 29 M.S. theses (13 as primary), 26 Ph.D. theses (10 as primary), and 23 Post-Doctoral Fellows. Twenty-four additional students, post-docs, and researchers pursued major projects in the lab.

### Research Summary:

- Interdisciplinary research in isotope geochemistry and astrobiology, as applied to three themes:
  - Environmental and experimental geochemistry, geomicrobiology.
  - Ancient Earth environments, evolution of life.
  - High-temperature geochemistry, geochronology.
- *Highlights:*
  - Development of “non-traditional” stable isotopes, including Mg, Si, and Fe, applied to the three themes above.
  - Application of new isotope systems to crust-mantle evolution, including Lu-Hf and Re-Os.
  - Use of short-lived U-series isotopes to trace evolution of active volcanic systems.
  - U-Th-Pb geochronology to redox proxies in Archean and Proterozoic marine sedimentary rocks.
  - Determining sedimentary provenance using isotope geochemistry.
  - Evolution of “supervolcano” (large caldera) systems.
- Thru mid-2018, Johnson published 181 peer-reviewed articles. Google Scholar reports a total citation of 13,433 for tracked journal articles and an *h-index* of 62. A total of 200 papers have been published from the ICP-TIMS lab. Thru mid-2018, funded on 53 external grants from NSF, NASA, ACS-PRF, DOD, DOE, and GRI, totaling \$ 28,552,526 (36 grants as PI, totaling \$ 20,133,492).

### Awards:

Excellence in Teaching Award, UW-Madison Geoscience Graduate Student Association (2014)  
 Vilas Distinguished Achievement Professorship (2013-present)  
 Honored Instructor (2012: G-111; 2011: G-375; 2010, 2017: G-160; UW-Madison)  
 Fellow of the Mineralogical Society of America (elected in 2005)  
 Fellow of the Geological Society of America (elected in 2004)  
 University of Wisconsin Vilas Fellowship (1997-1999)  
 NSF Graduate Fellowship (1982-1985)  
 California State Graduate Fellowship (1981-1982)

## Details

### 1) Professional Activities:

#### Administrative Positions:

##### ***Director, WARC: Wisconsin Astrobiology Research Consortium (2007-present)***

Oversee interdisciplinary research and education program in astrobiology across six institutions, involving 12 primary investigators, nine research scientists and staff, 16 post-docs, 16 graduate students, four undergraduate students, and 45 collaborators at other institutions. Astrobiology is an interdisciplinary field, bringing together astronomers, geologists, biologists, chemists, physicists, and engineers. WARC research projects have flown, or will fly, on missions with NASA and ESA (European Space Agency). WARC discoveries related to the geosciences include determining the habitability of Earth in the first b.y. of its history, development of iron-based metabolisms that predate oxygenic photosynthesis by >1 b.y., and determining the biological pathways of element cycling in terrestrial Mars-analog environments. WARC outreach efforts touch >25,000 K-12 students in Dane County, as well as interface with a national NASA education network that reaches nearly 100,000 people. WARC is supported by \$15M of funding from NASA over 10 years (PI: C. Johnson). Since 2007, WARC has published 213 peer-reviewed publications.

**Web site:** <http://geoscience.wisc.edu/astrobiology/>

##### ***Director, ICP-TIMS Isotope Laboratory (1988-present)***

Oversee research in stable (Mg, K, Si, and Fe) and radiogenic (Rb-Sr, Sm-Nd, Lu-Hf, U-Th-Pb, U-series) isotope geochemistry across a wide range of inter-disciplinary projects in anthropology, astrobiology, biology, and geology. To date, the lab has provided major support for 70 undergraduate and graduate theses and 27 post-docs; an additional 25 researchers have obtained data in the lab. The lab has supported research by 11 UW-Madison faculty. Equipment includes three magnetic-sector mass spectrometers (one TIMS, two MC-ICP-MS), a femtosecond laser-ablation system, and HEPA-filtered clean chemistry labs. To date, the lab has published 200 peer-reviewed papers. Total lab replacement cost: >\$6M.

**Web site:** <http://geoscience.wisc.edu/icp-tims/>

##### ***Department Chair (2002-2005)***

Directed administrative activities of the Department of Geoscience, which at the time included 21 Faculty, 15 Affiliated Faculty, 18 Administrative and Technical staff, ~30 post-Ph.D. researchers, ~70 graduate students, and ~40 undergraduate majors, with an annual operating budget of >\$7M. Directly supervised seven administrative staff on a daily basis. Worked extensively with Board of Visitors and UW Foundation on Alumni relations and fundraising.

##### Major accomplishments:

- Completed, under budget, a \$5M building addition that was originally \$1M over budget.
- Completed \$1M Alumni fundraising campaign.
- Re-organized and renovated six existing building spaces, which included \$4M in new laboratories.
- Expanded faculty hires, partially leveraged with Alumni funds, into new research directions in structural geology, mineralogy, and geomicrobiology.
- Expanded support staff positions, including an Assist. Director of Geology Museum.
- Created minority fellowship program for graduate students, in part funded by industry sponsors.

#### Professional Affiliations:

American Geophysical Union  
Geochemical Society  
Geological Society of America  
Mineralogical Society of America

**University and Professional Service:*****University Service Highlights:***

- Program Review, Depts. Botany & Zoology, UW-Madison [Committee Chair] (2013-2014)
- College of Letters and Science Academic Planning Council (2012-2015)
- College of Letters and Science Facilities Planning Committee (2010-2011)
- Graduate Committee (1987-1990; 2006-2008; 2010-2011)
- Curriculum Committee (1993-1994 [Chair]; 1999-2000; 2009-2010)
- Undergraduate Advisor in Geology (1989-1990; 2009-2010)
- Honorific Titles Committee (2006-2009)
- Department Chair, Geosciences @ UW-Madison (2002-2005)
- Physical Sciences Divisional Committee [tenure cases] (2000-2003)
- Search Committees: Sedimentology (2006-2007); Geophysics (2005-2006); Geomicrobiology [Chair] (2002-2004); Geophysics (2000-2001); Structure [Chair] (1996-1997); Petrology (1997-1998); Geochemistry (1999-2000); Mineralogy (1989); Petrology (1989-1990); Geophysics (1989-1990)
- Department Alumni Relations and Development Committee [Chair] (2011-2015)
- Department E-Newsletter Editor (2013-2015)
- Biology Program Review Committee (2011-2012)
- External Review Committee, Dept. Chemistry, UW Madison (2001)
- Finance Committee [Chair] (1995-2001)
- Department Council (1997-1999)
- Assistant Professor Mentor Committees: Tikoff (Chair); Singer (co-Chair); Sahai (Chair); Carroll; Carlson (Chair)
- L&S College Faculty Appeals Committee (1992-1997)
- Department Newsletter Editor (1991-1994)
- College Faculty Advisor (1988-1990)
- Personnel Committee (1988-1990; 1999-2001)

***Professional Service Highlights:***

- AbGradCon 2015 faculty liaison (2014-2015)
- AbSciCon Meeting Science Committee (2011-2012; 2014-2015)
- NASA-NSF workshop “Beyond Habitability: Life and the Early Earth” (2014)
- NSF workshop on future of research infrastructure (2014)
- NASA Astrobiology Roadmap panel of experts (2013-2014)
- Executive Committee, NASA Astrobiology Institute (2007-present)
- Associate Editor, *Geochimica et Cosmochimica Acta* (2005-2015)
- Associate Editor, *Astrobiology* (2008-2013)
- Senior Editor, *Astrobiology* (2014-2016)
- Panel Member: NSF-EAR (2004-2006; 2009-2012); NASA-Exobiology (2008)
- Organized NSF workshop on “Paleoenvironmental proxies” (2006)
- Special sessions organizer: AGU 2006; 2008; 2013, Goldschmidt 2008; 2014
- Member, Advisory Panel for isotope geochemistry, U.S. Geological Survey (2009-2010)
- External review, University of Georgia (2008)
- Editor, Rev. Min. Geochem. Volume 55, *Non-Traditional Stable Isotopes* (2003-2004)
- Organized short course for Geochemical Society on “Non-traditional stable isotopes” (2004)
- Associate Editor, *Geological Society of America Bulletin* (1995-2001)
- Journal reviewer for AGU, Amer. Mineralogist, Astrobiology, Canadian Jour. Earth Sci., Chem. Geol., Contrib. Min. Pet., Earth Planet. Sci. Lett., Environ. Sci. Tech., Geochim. Cosmochim. Acta, Geol. Soc. Amer., Int. Jour. Mass Spec., Jour. Volc. Geotherm. Res., Marine Geol., Nature, Nature Geosci., Precam. Res., Roy. Society, Science.
- Grant reviewer for ACS-PRF, NSF, DOE, NASA, USGS, NSERC, SNSF

**Invited Lectures, Talks, and Interviews (2014 to present):**

- University of Wisconsin (4/2018) “Stories in ancient rocks: Habitability and the Earliest Record of Life on Earth”, J.F. Crow Institute for the Study of Evolution
- University of Wisconsin (10/2017) “UW Documentary on Origins”, Wisconsin Science Festival
- University of Washington (10/2017) “Iron Formations: A lithology critical to understanding the biogeochemical evolution of the early Earth”
- University of Washington (10/2017) “‘New’ ways of looking at old rocks: Chronology of the redox evolution of the Earth in the Archean”
- University of Wisconsin (9/2017) “Precambrian Geology of the Lake Superior Region”
- University of Houston (9/2017) “‘New’ ways of looking at old rocks: Chronology of the redox evolution of the Earth in the Archean”
- University of Texas - Austin (4/2017) “‘New’ ways of looking at old rocks: Chronology of the redox evolution of the Earth in the Archean”
- University of Wisconsin - Madison (1/2017) “‘New’ ways of looking at old rocks: Chronology of the redox evolution of the Earth in the Archean”
- Monash University (7/2016) “Evolution of the Archean Biosphere as Seen through Isotope Geochemistry”
- University of Wisconsin - Institute for Discovery (4/2016) “The first billion years”
- Nanjing University (3/2016) “Astrobiology: Detecting life in deep time and deep space”
- Nanjing University (3/2016) “Short Course: Stable Isotope Geochemistry” (five 2-hour lectures).
- University of Auckland (2/2016) “Short Course: Stable Isotope Geochemistry” (five 1-hour lectures).
- NASA Astrobiology Institute web lecture (11/2015) “Ironing out life and the universe” (w/Loren Williams, Georgia Tech).
- University of Colorado - Boulder (10/2015) “Evolution of the Archean Biosphere as Seen through Isotope Geochemistry”
- University of Colorado - Boulder (10/2015) “Coupling Fe and Si in the Archean”
- Wisconsin Public Television - Wednesday Nite at the Lab (10/2015) “An Ancient Iron World: 3-Billion-Year-Old Rocks & Bugs”
- University of Utah (9/2015) “Evolution of the Archean Biosphere as Seen through Stable and Radiogenic Isotope Systems”
- Science News (9/2015) Interview for article on “Redox evolution of the early Earth”
- Daily Cardinal (8/2015) Interview on “Astrobiology”
- AbGradCon 2015 (7/2015) Invited talk for outreach workshop
- New Scientist (7/2015) Interview for article on “Evolution of the Continents”
- YouTube Channel “The Good Stuff” (1/2015) “Are we alone in the universe?” [https://www.youtube.com/watch?v=pKWcM5zNBfA&index=3&list=PLsRLUurFnnvWPis--UCIIzU\\_OvzAcM8Oo](https://www.youtube.com/watch?v=pKWcM5zNBfA&index=3&list=PLsRLUurFnnvWPis--UCIIzU_OvzAcM8Oo)
- University of Wisconsin - Madison (10/2014) “The Evolution of Life on Earth: A Perspective from a Rock-Based Astrobiologist”
- Telluride Workshop (8/2014) “Isotopic properties of iron oxides and hydroxides and their application to redox evolution of Earth's surface environments”
- The WhyFiles (7/2014) “Planet discoveries boost LifeSearch 2.0” <http://whyfiles.org/2014/planet-discoveries-boost-lifesearch-2-0/>
- University of Wisconsin - Madison (1/2014) “The Astrobiology Program: Where have we been and where are we going?”

**2) Education Activities:****Courses Taught:*****Undergraduate Courses:***

- G-100 “Introductory Geology” [3 cr] (Terms: F87,F88,S89,F89,S92,S93,F93,S94,S03,S07)
- G-101 “Introductory Geology” [5 cr] (Terms: S90,S91,F96)
- G-106 “Environmental Geology” (Terms: S96)
- G-109 “Geology of National Parks” (Terms: S92,S93,S94,S96,F97,F98,F00,F18)
- G-111 “Volcanoes & Civilization” (16 Terms: F97-S18)
- G-160 “Life in the Universe” (Terms: S10,S11,S12,S13,S14,S15,S17,S18)
- G-199/699 “Directed Study” (Terms: S00,F00,S01,F01,S02,F06)
- G-302 “Physics & Chemistry of the Earth’s Interior” (Terms: F05,F06)
- G-304 “Geobiology” (Terms: F12,F13,F14)
- G-370 “Introductory Petrology” (Terms: S92,S93,S94,S98)
- G-375 “Introductory Geochemistry” (Terms: F91,F92,F93,F95,F96,F98,S11,S12,S14,S15,S17,S18)
- G-376 “Geology of the WUSA” (Terms: S99,S00,S01)
- G-556 “Mountain Belts” (Terms: S00)
- G-692 “Senior Thesis” (Terms: F89,S96,F96,F01,S02,S14)

***Graduate Courses & Seminars:***

- G-770 “Magmatic Systems” (Terms: S88,S03)
- G-771 “Advanced Igneous Petrology” (Terms: S97,S99,S01,S06,F07)
- G-773 “Phase Equilibria” (Terms: F91)
- G-774 “Radiogenic Isotopes” (Terms: F89,F91,F95)
- G-875 “Stable Isotopes” (Terms: F90)
- G-875 “Trace Element Geochemistry” (Terms: F92)
- G-875 “Cordilleran Geology” (Terms: S92)
- G-875 “Crustal Cross Sections” (Terms: F98)
- G-875 “Active Volcanism” (Terms: F99)
- G-875 “Early Life on Earth” (Terms: F99)
- G-875 “Geomicrobiology” (Terms: F05)
- G-875 “Sedimentary Provenance” (Terms: S07)
- G-875 “Rates of Geologic Processes” (Terms: S07)
- G-875 “Astrobiology” (16 Terms: F07-F17)
- G-875 “Preparing Talks and Posters” (Term: S13,S15)
- G-916/971 “Field Trips” (Terms: S90,S91,S96,S97,F98)
- G-970 “Isotope Geochemistry” (Terms: S87,S98,S01,S04,S06,S08,S10,F15)
- G-991 “Geophysics Seminar” (Terms: F88,S89,F89,F90,S91,F92,F96,S97)
- G-999 “Advanced Independent Reading” (Terms: S88,F88,F89,S93,F93,S96,F96)

**Student and Post-Doctoral Advisees:**

Primary advisees noted in **bold**; advisees listed as “secondary” had major projects in my laboratory;  
\* marks current advisee.

**Undergraduate Theses & Research****Interns:**

**Anna Bradshaw (primary)**  
Ashley Hubbard (Carroll primary)  
**Victoria Khoo (primary)**  
**Mason Neuman (primary)**

**M.S. Students:**

**Meagan Bosket (primary)**  
Ben Bymers (Carroll primary)  
Lisa Colville (Carroll primary)  
**Heidi Crosby (primary)**  
Nathan Fortney (Roden primary)  
Sarah Green (Singer primary)  
Melissa Harper (Singer primary)  
**Breana Hashman (primary)**  
**Morgan Herrick (primary)**  
Brian Jicha (Singer primary)  
**Jim Ludois (primary)**  
**Nancy Mahlen (primary)**  
Shelly McGavern (Clark primary)  
**Marcus Milling, Jr (primary)**  
Liz Percak-Dennett (Roden primary)  
**Rebecca Poulson (primary)**  
**Thiruchelvi Reddy (primary)**  
**Ronald Schott (primary)**  
**Aaron Shultis (primary)**  
Eric Skarman (Carroll primary)  
Kate Smith (Singer primary)  
Kellen Springer (Lapen primary)  
Brooke Swanson (Carroll primary)  
**Eva Szilvagy (primary)**  
George Tangalos (Roden primary)  
Robert Ward (Walker primary)  
**Allison Wende (primary)**  
M. Ross Vandrey (Simo primary)  
Jane Van Heteren (Baumgartner primary)  
**Timothy Zeichert (primary)**

**Post-Doctoral Fellows:**

**Jeff Amato**  
**Meagan Ankney**  
**Karin Barovich**  
**Jennifer Cappel-Cousins**  
**Piyali Chanda \***  
**Andy Czaja**  
**Francois-Xavier D'abzac**  
**Joseph Ezzo**  
**Andrew Friederich**  
**Adrianna Heimann**  
**Brian Jicha**

**Julie O'Leary (primary)**  
**Rebecca Poulson (primary)**  
**Thiruchelvi Reddy (primary)**  
**Giovani Sella (primary)**

**Ph.D. Students:**

Nathan Anderson (Singer primary)  
M'Bark Baddouh (Carroll primary)  
**Brian Beard (primary)**  
**Meagan Ankney (primary)**  
Caroline De Meyer (Baumgartner primary)  
Lauren Chetel (Carroll primary)  
Nan-Chin Chu (German primary)  
Laura Croal (Newman primary)  
Amalia Doebbert (Carroll primary)  
Cathy Evans (Clark primary)  
Robert Handler (Scherer primary)  
Haroldson, Erik (Brown primary)  
**Garret Hart (primary)**  
John Hora (Singer primary)  
Brian Jicha (Singer primary)  
Andrew Kylander-Clark (Hacker primary)  
**Tom Lapen (primary)**  
**Nicholas Levitt (primary) \***  
**Nancy Mahlen (primary)**  
Jeff Pietris (Carroll primary)  
**Lee Riciputi (primary)**  
Merideth Rhodes (Carroll primary)  
Erik Scherer (Cameron primary)  
**Ronald Schott (primary)**  
Susanne Skora (Baumgartner primary)  
**Nicholas Van Wyck (primary)**

**Chris Kennedy**  
**Weiqliang Li**  
**Kent Ratajeski**  
**Aaron Satoski**  
**Silke Severmann**  
**Joe Skulan**  
**Sue Welch**  
**Rene Wiesli**  
**Bryce Winter**  
**Lingling Wu**  
**Kosei Yamaguchi**  
**Xinyuan Zheng \***

**Additional students, post-docs, and researchers who worked in the lab:**

Marcia Blanco	Elizabeth King
Jan Boyer	Kai Liu
Joan Bruggink	Dave Malone
Heather Cunningham	Bill Middleton
Caroline deMeyer	Nathalia Migueles
Cathy Evans	Sakiko Olsen
Mike Gerdenich	Benita Putliz
Martha Gerdes	Alberto Reyes
Hilary Gittings	Kyle Rybacki
Mihaela Glamoclija	Bernie Saini-Eidukat
Ashley Hubbard	Henry Sun
Elliot Jackson	Randy Williams

**3) Research Activities:****External Grants:****Pending:**

NASA, Reductive Dissolution of Iron Sulfides by Primitive Archaea (PI: Eric Boyd, Co-PI's: **Clark Johnson**, Brian Beard, Piyali Chanda), \$ 564,529, 12/2018-11/2021.

**Funded:****\* *Administrative/Education/Student Support Grants:***

NASA, NNX13AP40H, Clumped isotopes in carbonates as a potential biosignature, NASA Earth and Space Science Fellowship (NESSF) Program (science PI: Nick Levitt; **Inst. PI: Clark Johnson**), \$ 60,000, 9/2014-8/2015.

NSF, 0609120, Funding for Workshop on Paleoenvironmental Proxies (**PI: Clark Johnson**), \$ 26,289, 2/2006-1/2007.

NSF, 9653146, Three Dimensional Visualization in Introductory Earth Science Courses (**PI: Clark Johnson**; Co-PI: Phil Brown), \$ 86,617, 12/1996-5/1999.

**\* *Equipment & Facilities Grants:***

NSF, 1347056, Analytical method development: Comparison of elemental and isotopic fractionation during femtosecond and nanosecond laser ablation (PI: Brian Beard, **Co-PI: Clark Johnson**), \$ 141,021, 6/2014-5/2016.

NSF, 1242728/1028462, Acquisition of a multi-collector, inductively coupled plasma mass spectrometer (MC-ICP-MS) (**PI: Clark Johnson**, Co-PI: Brian Beard), \$ 429,429, plus \$10,000 supplement, 10/2011-9/2013.

NSF, 0939981/0901938, Acquisition of a femtosecond laser ablation system (**PI: Clark Johnson**), \$ 72,000, 1/2009-12/2009.

NSF, 0824890, Acquisition of an X-ray diffraction unit for earth science research and education at the University of Wisconsin, Madison (PI: Huifang Xu, **Co-PI's:** Nita Sahai, Joseph Mason, Eric Roden, **Clark Johnson**), \$ 148,346, 9/2008-8/2009.

NSF, 0516725, Technician support for a stable isotope ion microprobe (PI: John Valley, **Co-PI: Clark Johnson**, Noriko Kita), \$ 224,930, 7/2005-6/2008.

NSF, 0318213, Technician Support: Request for Phase 1 for MC-ICP-MS Laboratory (**PI: Clark Johnson**), \$ 194,559, 4/2004-4/2007.

NSF, 0319230, Acquisition of an ion microprobe for stable isotope analysis (PI: John Valley, **Co-PI's:** **Clark Johnson**, Daniel Kelly, Dale Schoeller, and Brad Singer), \$ 2,000,000, 8/2003-7/2005.

NSF, 9871095, Acquisition of the next-generation magnetic-sector inductively coupled plasma mass spectrometer (**PI: Clark Johnson**, Co-PI: Brian Beard), \$ 250,000, 6/1999-5/2001.

NSF, 9406684, Technician support for MC-ICP-MS laboratory – Phase II (**PI: Clark Johnson**), \$ 85,450, 8/1994-5/1998.

- NSF, 9206456, Acquisition of an electron microprobe (PI: John Valley; **Co-PI's:** Gordon Medaris, Lukas Baumgartner, Phil Brown and **Clark Johnson**), \$ 331,998, 1/1992-12/1993.
- NSF, 9105966, Technician support for MC-ICP-MS laboratory – Phase I (**PI: Clark Johnson**), \$ 89,821, 6/1991-5/1994.
- NSF, 8618366, Acquisition of a solid-source mass spectrometer (**PI: Clark Johnson**; Co-PI's: John Valley, Gordon Medaris, and Phil Brown), \$ 131,000, 6/1987-5/1989.

**\* Research Grants:**

- NSF, 170320, Developing a new proxy for silicate weathering: an investigation of K isotope fractionation during clay formation (PI: Brian Beard; Co-PI's: **Clark Johnson**, Xinyuan Zheng), \$ 335,846, 7/2018-6/2020.
- PRF/ACS, The origin of illite in sedimentary basins as determined by K, Si, Fe, and Mg isotope analysis: New tools for basin analysis (**PI: Clark Johnson**), \$ 110,000, 7/2018-6/2020.
- NSF, 1523697, Archean continental weathering: Revisiting the Sr isotope seawater curve (**PI: Clark Johnson**, Co-I's: Brian Beard, Aaron Satkoski), \$ 218,697, 8/2015-7/2018.
- NSF, 1451176, SusChEM: Collaborative Research: Influence of Fe<sup>2+</sup>- catalyzed recrystallization on Fe oxide reactivity and C stabilization (PI: Brian Beard, **Co-PI: Clark Johnson**), \$ 98,172, 6/2015-5/2019.
- NASA, NNA13AA94A, Astrobiology Institute Cycle 6, Habitability, life detection, and the signatures of life on the terrestrial planets (**PI: Clark Johnson**, UW Co-I's: Brian Beard, John Valley, Huifang Xu, Eric Roden, Brooke Norsted; Other Co-I's: Pascale Ehrenfreund [George Wash. Univ], Chris Romanek [Univ. KY], Eric Boyd [MSU], Aaron Cavosei [Univ. Puerto Rico], Max Coleman [JPL], Kay Ferrari [JPL], Bill Schopf [UCLA]), \$ 7,632,303, plus \$ 67,800 supplement, 1/2013-12/2018.
- NSF, 1144937, Timescales of deep and shallow magmatic evolution of Mt. Mazama (Crater Lake) (**PI: Clark Johnson**, Co-PI's: Brian Beard and Brian Jicha), \$ 249,215, 4/2012-4/2016.
- NSF, 1122855, Collaborative Research: Stable isotope investigation of Fe oxide reactivity and natural isotope fractionation (**PI: Clark Johnson**, Co-PI's: Brian Beard and Michelle Scherer), \$ 259,887, plus \$ 39,949 supplement, 10/2011-9/2015.
- DOE, DE-SC0006692, Electron transfer and atom exchange between aqueous FeII and structural FeIII in clays: Role in U and Hg(II) Transformations (PI: Michelle Scherer; **Co-PI's: Clark Johnson**, Kevin Rosso, Ken Kemner, Max Boyanov, and Ed O'Loughlin), \$ 650,000 (UW portion: \$ 264,010), 9/2011-8/2014.
- NASA, NNA08CN86A, Astrobiology Institute Cycle 4, Detection of the signatures of life on Earth and other planetary bodies from its organic and mineralogical record (**PI: Clark Johnson**, UW Co-I's: Brian Beard, John Valley, Nita Sahai, Huifang Xu, Eric Roden, Brooke Norsted; Other Co-I's: Pascale Ehrenfreund [George Wash. Univ], Chris Romanek [Univ. KY], Max Coleman [JPL], Kay Ferrari [JPL], Mahadeva Sinha [JPL]) \$ 6,513,429, plus \$ 788,398 in supplemental funding, 11/2007-12/2013.
- NSF, 0635593, Collaborative Research: Experimental determination of iron (Fe) isotope fractionations in sulfide minerals (**PI: Clark Johnson**, Co-PI's: Brian Beard, Greg Druschel, Martin Schoonen), \$ 149,834 1/2007-12/2009.
- NSF, 0506679, NIRT: Nanoparticle Fe as a Reactive Constituent in Air, Water, and Soil (PI: Michelle Scherer, **Co-PI's:** John Coates, Vicki Grassian, **Clark Johnson**, Martin St. Clair), \$ 1,991,852 (UW portion: \$ 370,583), 8/2005-7/2009.
- NSF, 0525417, Mechanisms of Fe isotope fractionation during biological Fe(III) reduction (**PI: Clark Johnson**, Co-PI's: Brian Beard and Eric Roden), \$ 336,225, 7/2005-6/2008.
- NSF, 0337667, A new generation of timescales for arc magmatic processes (PI: Brad Singer, **Co-PI's: Clark Johnson** and Brian Beard), \$ 427,036, 1/2004-12/2007.
- NSF, 0309853, How long does it take to make and preserve a HP/UHP terrane? Petrologic and geochronologic studies of the Zermatt-Saas and Monte Rosa units of the Western Alps (**PI: Clark Johnson**, Co-PI: Brian Beard), \$ 348,628, 6/2003-5/2007.
- NASA, Exobiology program, Biogeochemistry of iron in a near-neutral pH iron-depositing hot spring with phototrophic microbial mats (PI: Beverley Pierson, **Co-PI's:** Brian Beard and **Clark Johnson**), \$ 336,558 (UW portion: \$ 84,718), 5/2002-4/2005.



- NASA, ASTID program, Measurement of the isotopic composition of iron oxides as a biosignature on Mars (PI: Mahadeva P. Sinha (JPL); **Co-PI's:** Brian Beard and **Clark Johnson**), \$ 101,687 (UW part), 8/2002-7/2004.
- NASA, NCC2-5449, Fe isotope studies of microbial ecology (**PI: Clark Johnson**, Co-PI: Brian Beard), \$ 187,664, 8/2001-7/2004.
- NSF, 0106614, Collaborative Research: Experimental determination of abiological and inorganic Fe and O isotope fractionation (**PI: Clark Johnson**, Co-PI: Brian Beard), \$ 225,156, 8/2001-7/2004.
- NSF, 0073692, Collaborative Research: Integrated isotopic, geochronologic, and paleomagnetic investigations of Cretaceous coastal basins: Assessment of northward translation of the 'Baja-BC' (**PI: Clark Johnson**; Co-PI: Basil Tikoff), \$ 150,000, 6/2000-5/2004.
- NSF, 9903252, Fe isotopes and biological processing of Fe in the pre-oxygenated Earth: Archean to mid-Proterozoic Banded Iron Formations (**PI: Clark Johnson**, Co-PI: Brian Beard), \$ 170,000, 6/1999-5/2001.
- NSF, 9980512, The role of mafic crust in orogenic magmatism - New perspectives from Re-Os isotopes (**PI: Clark Johnson**), \$ 141,756, 12/99-4/03.
- NASA-JPL, 1213550, Detection of biological signatures in minerals by isotopic measurements (**PI: Clark Johnson**, Co-PI: Brian Beard), \$ 21,000, 12/1999-11/2000.
- NASA Astrobiology Institute, Coevolution of planets and biospheres: Lessons from Earth and Mars (**PI: Clark Johnson**, Co-PI: Brian Beard; member of JPL [Ken Nealson] consortium), \$ 517,676 (amt. to Johnson), 7/1998-2/2004.
- NASA/NSF, 9713968, The isotopic composition of iron: A chemical fingerprint for ancient life (PI: Brian Beard; **Co-PI's:** **Clark Johnson** and Ken Nealson), \$ 126,000. 9/1997-8/1999.
- NSF, 9706363, Collaborative Research: Contrasting evolution of the Indian Peak and Central-Nevada calderas (**PI: Clark Johnson**), \$ 12,023, 7/97-6/99.
- NSF, 9628549, Chemical and isotopic compositions of late-Cretaceous and early Tertiary conglomerates, Western California: Constraints on paleogeography (**PI: Clark Johnson**), \$ 58,044, 6/1997-1/1999.
- NSF, 9506612, Thermo-mechanical and isotopic evolution of the Death Valley Volcanic Field (**PI: Clark Johnson**), \$ 40,000, 6/1995-8/1997.
- DOD, Preliminary study of Sr isotopes in Viet Nam War casualties (**PI: Clark Johnson**), \$ 12,750, 6/1995-5/1997.
- NSF, 9316277, Deep crustal xenoliths (**PI: Clark Johnson**; Co-PI: Karen Barovich), \$ 23,901, 1/1994-12/1995.
- NSF, 9304455, Hafnium isotopes and crust-mantle evolution (**PI: Clark Johnson**, Co-PI: Karin Barovich), \$ 150,000, 6/1993-5/1995.
- ACS-PRF, 25677-AC8, U/Pb ages in carbonates (**PI: Clark Johnson**; Co-PI: Bryce Winter), \$ 40,000, 1/1992-12/1993.
- NSF, 9122741, Sr and Nd isotopes in the Arctic Ocean (PI: Dave Clark; **Co-PI: Clark Johnson**), \$ 130,337, 6/1991-5/1993.
- NSF, 9106271, Hafnium isotope studies of crust-mantle evolution (**PI: Clark Johnson**; Co-PI: Jennifer Cousins), \$ 135,692, 6/1991-5/1993.
- NSF, 9111680, Sr isotopes in Archaeology (PI: Doug Price; **Co-PI's:** Jim Burton and **Clark Johnson**), \$ 76,738, 6/1991-5/1993.
- NSF, 9004795, Evolution of the Bohemian Massif, (PI: Gordon Medaris; **Co-PI's:** **Clark Johnson** and Herb Wang) \$ 68,700, 6/1990-5/1992.
- GRI, 89-0744-014, Gas Research Institute: The Michigan Basin, (PI: Bob Dott; **Clark Johnson** 1 of 7 **Co-PI's**), \$ 1,229,813 (amt. to Johnson: \$ 189,000), 6/1989-5/1992.
- ACS-PRF, 21311-G8, Evolution of the Rio Grande Rift (**PI: Clark Johnson**), \$ 18,000, 6/1989-5/1991.
- NSF, 8803892, Evolution of the San Juan volcanic field, (**PI: Clark Johnson**), \$80,300, 6/1988-5/1990.

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**Publications:**

Underlined authors below note student or post-doc advisee.

***In Preparation, submitted, or in revision:***

- Chanda, P, Zhou, Z, Latta, D, Scherer, MM, Beard, BL, and **Johnson, CM**. Effect of organic C on stable Fe isotope fractionation and isotope exchange kinetics between aqueous Fe(II) and ferrihydrite at neutral pH. Environ. Sci. Technol., to be submitted.
- Djokic, T, Van Kranendonk, MJ, Satkoski, AM, **Johnson, CM**, Stellar, L, and Garber, U. A Paleoproterozoic hydrogen-based ecosystem: Evidence from terrestrial microdigitate stromatolites of the 3.5 Ga Dresser Formation, Pilbara Craton, Australia. Geobiology, revision returned to journal.
- Friedrich, AJ, Beard, BL, Reddy, T, Scherer, MM, Spicuzza, MJ, Valley, JM, and **Johnson, CM**. Iron and oxygen isotope exchange and fractionation between hematite ( $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>), aqueous Fe(II), and water. Geochim. Cosmochim. Acta, to be submitted.
- Levitt, NP, Romanek, CS, Beard, BL, Li, W, Chakraborty, S, and **Johnson, CM**. Factors influencing the Mg isotope composition of magnesian calcite. Geochim. Cosmochim. Acta, to be submitted.
- Rybacki, KS, Li, W, Kump, LR, Beard, BL, Roden, EE, and **Johnson, CM**. A Pb isotope fingerprint of oxidative weathering and Uranium mobility at the end of Lomagundi-Jatuli event. Earth Planet. Sci. Lett., to be submitted.
- Zheng, X-Y, Beard, BL, and Johnson, CM. Constraining silicon isotope exchange kinetics and fractionation between aqueous and amorphous Si at room temperature. Geochim. Cosmochim. Acta, to be submitted.

***Published Articles (peer-reviewed; grouped into three research areas below):*****A) Environmental and experimental geochemistry, geomicrobiology, astrobiology**

- Friedrich, AJ, Nebel, Oliver, Beard, BL, and **Johnson, CM** (2018) Iron isotope exchange and fractionation between hematite ( $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>) and aqueous Fe(II): A combined three-isotope and reversal-approach to equilibrium study. Geochim. Cosmochim. Acta, in press.
- Williams, RT, Beard, BL, Goodwin, LB, Sharp, WD, **Johnson, CM**, and Mozley, PS (2018) Radiogenic isotopes record a 'drop in a bucket' – a fingerprint of multi-kilometer-scale fluid pathways inferred to drive fault-valve behavior. Jour. Struct. Geol., in press.
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- Zheng, X-Y, Beard, BL, Lee, S, Reddy, T, Xu, H, and **Johnson, CM** (2017) Contrasting particle size distributions and Fe isotope fractionations during nanosecond and femtosecond laser ablation of Fe minerals: implications for LA-MC-ICP-MS analysis of stable isotopes. Chem. Geol. 450:235-247.
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