

## ***JENNIFER L. MACALADY***

Department of Geosciences, The Pennsylvania State University  
211 Deike Building, University Park, PA 16802 U.S.A.  
tel: (814) 865-6330, email: [jlm80@psu.edu](mailto:jlm80@psu.edu)

### ***Appointments***

2011- Pennsylvania State University, Associate Professor of Geosciences  
2005- Pennsylvania State University, Ecology Interdepartmental Degree Graduate Faculty  
2004-2011 Pennsylvania State University, Assistant Professor of Geosciences  
2003-2004 Carleton College, Visiting Assistant Professor  
2002 University of California-Berkeley, Visiting Postdoctoral Researcher  
2001-2002 University of Wisconsin-Madison, Postdoctoral Research Associate

### ***Education***

2000 University of California at Davis, Ph.D. in Soil Science, “Microbial ecology and stable isotope biogeochemistry of methane oxidation.” Advisor: Kate M. Scow  
1998 University of California at Davis, M.S. in Soil Science, “Effects of widely used agricultural chemicals on soil microbial activity and community structure.” Advisor: Kate M. Scow  
1991 Carleton College, B.A. in Geology *cum laude*, “Evidence for one or more bolide impacts at the Triassic-Jurassic boundary” (thesis awarded distinction).

### ***Professional Training***

2000 University of Utah, Stable Isotopes in Ecology and Geology Course  
1990 Dartmouth College Moscow State University Ecology Exchange Program

### ***Honors and Awards***

2019 Penn State Center for Global Studies Career Development Award  
2016 Penn State College of EMS Wilson Travel Award  
2015 Extraordinary Women Leaders in Speleology  
2013 Hanse Fellow  
2012 Kavli Fellow of the National Academy of Sciences  
2009 Penn State College of EMS Faculty Mentoring Award  
1999 UC Davis Graduate Studies International Travel Award  
1999 Jastro-Shields Fellow  
1998 U.S. Environmental Protection Agency STAR Graduate Fellow  
1998 Jastro-Shields Fellow  
1991 Lawrence McKinley Gould Prize in Natural Science  
1990 Duncan Stewart Fellow  
1990 Richter Fellow  
1990 Sigma Xi Research Society

## ***Grants and Other Funding Awards***

pending	<b>National Science Foundation</b> (\$497,642) “Acidic pit lakes: Novel biogeochemical reactors evaluated via multi-omics approaches” (co-PI)
2017	<b>Penn State Institutes for Energy and the Environment</b> (\$25,000), “Karst and Coastal Ecosystems” (PI)
2017	<b>Butler Cave Conservation Society</b> (\$400) Sinking Creek Grant Award (PI)
2016	<b>Penn State EMS College</b> (\$1500) Wilson Travel Award
2015	<b>National Science Foundation Gulf Research Initiative</b> (\$396,000) “The Center the for Integrated Modeling and Analysis of Gulf Ecosystems II” (co-PI)
2013	<b>National Science Foundation</b> (\$300,000) “Chemoautotrophic production of extracellular S in a Proterozoic analog ecosystem (PI)
2013	<b>National Science Foundation</b> (\$340,000) “Oxygen production in a model Proterozoic environment (PI)
2012	<b>National Science Foundation Deep Carbon Observatory</b> (nucleic acid sequencing) “Census of Deep Life: Sulfidic Deep Terrestrial Subsurface Field Study” (PI)
2011	<b>National Science Foundation</b> (\$179,001) “Functional diversity of microbial trophic guilds defined using stable isotope ratios of proteins” (PI)
2011	<b>National Science Foundation Gulf Research Initiative</b> (\$389,366) “The Center the for Integrated Modeling and Analysis of Gulf Ecosystems (C-IMAGE) (co-PI)
2011	<b>U.S. Dept. of the Interior Office of Surface Mining</b> (\$200,000) “Low-pH iron oxidation for passive treatment of coal mine drainage (co-PI)
2011	<b>U.S. Army ERDC</b> (\$178,000) “Multichannel microbial fuel cell station for simultaneous electrochemical and biochemical monitoring and control” (co-PI)
2010	<b>U.S. Department of Energy Joint Genome Institute</b> (nucleic acid sequencing) “Uncultivated and novel microbial lineages in terrestrial subsurface biofilms from a sulfuric aquifer” (PI)
2009	<b>NASA</b> (\$8,728,908) “Signatures of life on Earth and beyond” (co-PI)
2009	<b>ConocoPhillips</b> (\$150,000) “Microbial population structure of oil reservoir subsurface environments” (PI)
2009	<b>American Chemical Society Petroleum Research Fund</b> (\$100,000) “Microbial biogeochemistry of isoprenoid hydrocarbon cycling” (PI)
2006	<b>National Science Foundation</b> (\$458,107) “The molecular signature of sulfide: biomarkers of sulfur-oxidizing autotrophs” (PI)
2006	<b>NASA</b> (\$49,774) “Genomics of subsurface extremophiles” (PI)
2006	<b>NASA</b> (\$37,000) “Astrobiological drilling of the Chesapeake Bay impact structure (PI)
2004	<b>National Science Foundation</b> (\$22,778) REU Supplement (PI)
2003	<b>National Science Foundation</b> (\$179,000) “Microbial community controls on sulfide oxidation rates and cave formation in a subsurface biogeochemical system” (PI)

## ***Teaching***

2004-	GEOSC 21 Origin & Evolution of Earth & the Biosphere GEOSC 409W Geomicrobiology
-------	--

GEOSC497 Undergraduate Astrobiology Seminar  
 EMSC100S Deep History of Everyday Objects  
 GEOSC/SOILS/CE536 Biogeochemistry  
 GEOSC 597 Microbial Biogeochemistry/Biominerals  
 ECLGY597 Microbial Biogeography  
 ABIOL590 Astrobiology Field Course/Graduate Seminar

## ***Mentoring***

### *Postdoctoral Advisees*

1. Brandi Cron Kamermans, Geosciences Distinguished Postdoctoral Fellow
2. Trinity L. Hamilton, currently Asst. Prof. at University of Minnesota
3. Sharmishtha Dattagupta, currently Tenured Professor at University of Göttingen
4. Dominique J. Tobler, currently Assoc. Prof. at University of Copenhagen

### *Graduate Students -- Advisees*

1. Claire Webster (Ph.D. Geosciences)
2. Diana Ayala (Ph.D. Civil & Environmental Engineering)
3. Christian Clark (M.S. Geosciences 2017) *Fate of elemental sulfur in a sulfuric cave aquifer mixing zone*
4. Zena Cardman (Ph.D. Geosciences)
5. Kristine Richter (Ph.D. Biology 2013) *DNA preservation under extreme conditions*
6. Uyen Nugyen (Ph.D. Geosciences, 2018) *Geochemical and metagenomic investigation of marine hydrocarbon biodegradation*
7. Muammar Mansor (Ph.D. Geosciences 2017) *Isotopic and trace metal geochemistry of calcite, gypsum, and pyrite as proxies for ancient life and environments*
8. Amanda Labrado (M.S. Geosciences 2017) *Evidence for dissimilatory nitrate reduction to ammonium by aqueous biofilms in the sulfuric caves of Frasassi, Italy*
9. Leah Tsao (M.S. Geosciences 2014) *Culture-dependent and independent studies of sulfur oxidizing bacteria from the Frasassi Caves*
10. Christen Grettenberger (Ph.D. Ecology 2015) *Microbial Communities In Acid Mine Drainage Ecosystems*
11. Lance Larson (Ph.D. Civil & Environmental Engineering 2013) *Integrated Hydro-biogeochemistry – Iron Dynamics In Acid Mine Drainage Environments*
12. Rebecca McCauley (Ph.D. Geosciences 2016) *Metabolic Potential and Diversity of the Microbial Communities in a Sulfidic Cave System*
13. Heidi Albrecht (Ph.D. Geosciences 2011) *Bacteriohopanepolyols Across Environmental Gradients*
14. Daniel Jones (Ph.D. Geosciences 2012) *Microbial ecology and biogeochemistry of sulfuric karst ecosystems*
15. Katherine Dawson (Ph.D. Geosciences 2012) *Biogeochemistry of Isoprenoid Production and Anaerobic Hydrocarbon Biodegradation*
16. Beth Baumann (M.S. Geosciences 2008)
17. Joel Moore (Ph.D. Geosciences 2008) *Biogeochemistry of granitic weathering*
18. Bryn Kimball (Ph.D. Geosciences 2009) *Biogeochemical Cycling of Copper in Acid Mine Drainage*

### *Graduate Students – Committee Member*

19. Esther Muñoz (Geosciences)
20. Hillary Smith, Ph.D. (Geosciences)
21. Aoshuang Ji, Ph.D. (Geosciences)
22. Heidi Aronson, Ph.D. (University of Southern California)
23. Andrew Hyde, Ph.D. (Geosciences)
24. Clarissa Crist, M.S. (Geosciences)
25. Jennifer Thweatt, Ph.D. (Biochemistry, Microbiology & Molecular Biology 2019)
26. Edelio Rivera Bazan, M.S. (Plant Pathology & Environmental Microbiology 2018)
27. Regina Wilpezeski, Ph.D. (Geosciences 2017)
28. Fei Gan, Ph.D. (Biochemistry, Microbiology & Molecular Biology 2014)
29. Arpita Roy, Ph.D. (Astronomy & Astrophysics 2017)
30. Kimberly Star Cartier, Ph.D. (Astronomy & Astrophysics 2017)
31. Bishoy Samir Kamel, Ph.D. (Biology 2017)
32. Jose Luis Gonzalez-Pimentel (Institute of Natural Resources and Agrobiology, Seville, Spain)
33. Fernando Puente Sanchez, Ph.D. (Centro de Astrobiologia, Spain)
34. Colin Closek, Ph.D. (Biology 2016)
35. Laurence Bird, Ph.D. (Geosciences 2016)
36. Amanda Martino, Ph.D. (Geosciences 2014)
37. Leah Brandt, Ph.D. (Geosciences 2016)
38. Judith Klatt, Ph.D. (MPI for Marine Microbiology, Bremen, Germany 2017)
39. Sebastian Haas, M.S. (Marine Microbiology, Bremen, Germany 2016)
40. Matthew Gonzalez, M.S. (Geosciences 2015)
41. Khadouja Harouaka, Ph.D. (Geosciences 2016)
42. Jan Bauermeister, Ph.D. (Georg-August University of Goettingen, Germany 2014)
43. Heath Watts, Ph.D. (Geosciences)
44. Matthew Pagel, Ph.D. (Biochemistry, Microbiology & Molecular Biology)
45. Lev Horodynski, Ph.D. (Geosciences)
46. Rachel Wagner, Ph.D. (Environmental Engineering)
47. Wei Xiong, M.S. (Biochemistry, Microbiology & Molecular Biology)
48. Stamatina Hunter, M.S. (Geosciences)
49. Fei Gan, Ph.D. (Biochemistry, Microbiology & Molecular Biology)
50. Grace Darabor, Ph.D. (Energy & Mineral Engineering)
51. Beth Herndon, Ph.D. (Geosciences)
52. Moshe Rhodes, Ph.D. (Geosciences)
53. Burt Thomas, Ph.D. (Geosciences)
54. Lisa Steinberg, Ph.D. (Environmental Engineering)
55. Fabia Battistuzzi, Ph.D. (Biology)
56. Joe McIntyre, M.S. (Environmental Engineering)
57. Katja Meyer, Ph.D. (Geosciences)
58. Irene Schneider, M.S. (Geosciences)
59. Kate Luley, M.S. (Biology)
60. Aaron Diefendorf, Ph.D. (Geosciences)
61. Alexis Navarre, Ph.D. (Geosciences)
62. Jessica Moon, Ph.D. (Ecology)
63. Amaya Garcia Costas, Ph.D. (Biochemistry, Microbiology & Molecular Biology)

*Undergraduate Students – Thesis Advisees*

1. Louisa Lytle (Geosciences 2018, co-advisor with Dr. Rose)
2. Kyle Sherbine (Geobiology 2018, co-advisor with Dr. Wardrop)
3. Nathan Pennypacker (Geosciences 2018)

4. William Sampson (Geosciences 2017)
5. Emma Babcock (Geosciences 2016)
6. Will Rosenow (Geobiology 2016)
7. Zoe Todd (with Honors in Astrobiology 2015)
8. Alexandra Pearce (Geobiology 2014)
9. Arsh Chopra (Life Sciences with Honors 2012)
10. Courtney Kolesar (Geobiology 2012)
11. Richard Dabundo (Geobiology 2011)
12. Daniel Mills (Geobiology with Honors 2010)
13. Daniel Bloom (Biology with Honors in Astrobiology 2008)
14. Rob Hegemann (Geosciences 2007)
15. Martin Hoban (Learning Factory Capstone Project, Mech. & Electrical Eng 2005)
16. Dan Milliken (Learning Factory Capstone Project, Mech. & Electrical Eng. 2005)
17. Mathew Keefer (Learning Factory Capstone Project, Mech. & Electrical Eng. 2005)
18. Kyle Labowski (Learning Factory Capstone Project, Mech. & Electrical Eng. 2005)

*Undergraduate Students – Independent Research Supervisor*

19. Sierra Astle (2020), Honors Astrobiology literature research project
20. Brandon Hasty (2019-2020), PSU Astronomy (independent research)
21. Alec Matheus (2019-2020), PSU Biochemistry (independent research)
22. Cory Lestochi (2018-2019), PSU Biochemistry, Enrichment culturing of phototrophs and their viruses from Fayetteville Green Lake, NY (independent research)
23. Jessica Briggs (2018), PSU WISER/MURE (independent research, co-advised by Dr. Cosmidis)
24. Rumya Ravi (2017), Carleton College Geology, Characteristics of zero-valent sulfur at the surface of a sulfide-rich aquifer (thesis research)
25. Alexis Golestani (2016-2017), PSU Earth Sciences, Geochemical Tracing of a Persistent Microbial Biofilm in Wishing Well Cave, VA (independent research)
26. Spencer Lovrinic (2015-2017), PSU Biology, Geochemistry and microbiology of carbon-rich cave wall formations (independent research)
27. Alexandra Pearce (2013-2014), PSU Geobiology, Microbiology and geochemistry of an iron-depositing AMD spring, PA (post-graduate independent research)
28. Muammar Mansor (2011), PSU Biotechnology (independent research in Astrobiology)
29. Justine McCann (2011-2012), PSU undeclared, Winogradsky model ecosystems for iron cycling in PA acid mine drainage (WISER research scholar)
30. Masaru Nobu (2011), Carleton College Geology/Biology, Factors controlling competition among anoxygenic phototroph populations in meromictic Fayetteville Green Lake, NY (thesis research)
31. Janna Lambson (2009), Wash. Univ. St. Louis, Environmental Studies Kinetics of biotic and abiotic iron oxidation in Pennsylvania acid mine drainage (NSF Geomicrobiology REU)
32. Victoria Marone (2008), PSU undeclared, Mathematical model that reproduces the self-organizing structure of sulfur-oxidizing bacterial biofilms (WISER research scholar)
33. Stephanie Spielman (2008), Brown Univ. Biology, Diversity of archaea inhabiting extremely acidic cave wall biofilms (NSF Astrobiology REU)
34. Lorianne Bermudez (2008), U. Puerto Rico Mayaguez, Archaeal membrane modification in response to pH changes (SROP scholar)
35. Esther Yang (2008), Emory University Biology, Initial characterization of deep vent biofilms in sulfidic Little Salt Spring, FL (NSF Geomicrobiology REU)
36. Jignasha Patel (2007-2009), PSU Biochemistry, Culture of extremely acidophilic organic matter degrading microorganisms from sulfidic caves (independent research)
37. Shanna Dunn (2006), PSU Earth Science, Lipid biomarkers analysis of cycloalkane-containing bacterial cultures (independent research)

38. Briana Schmeidekamp (2006), PSU Biochemistry & Molecular Biology, Phylogeny of benthic sulfur-oxidizing biofilms from Green Lake, NY (independent research)
39. Rob Hegemann (2005), PSU Geosciences, Geochemistry and geomicrobiology of sulfidic lakes (thesis research)
40. Tess Stoffer (2005), Carleton College Biology, Cultivation of sulfur oxidizing microorganisms (post-graduate research internship)
41. Lindsey Albertson (2005), Brown Univ. Geology/Biology, Geomicrobiology of veil-like cave biofilms (NSF Astrobiology REU)
42. Dan Jones (2005), Carleton College Geology, Diversity of extremely acidic cave biofilms (thesis research)

### ***Public Outreach (selected)***

- 2019            **Christian Science Monitor**, 27-28 Oct 2019, story [here](#)
- 2019            **New Scientist** (London), 26 Sept 2019, story [here](#) [Crane, Leah. *New Scientist*. 1/27/2019, Vol. xxx Issue xxxx, pxx. xxp. DOI: x.]
- 2019            **New Scientist** (London), story [here](#) [Lu, Donna. *New Scientist*. 11/16/2019, Vol. xxx Issue xxxx, pxx. xxp. DOI: x.]
- 2019            **PBS/NOVA**, 19 April 2019, quoted [here](#).
- 2019            **Italian National Museum of Science and Technology** (Milan, Italy), Panel discussion at public screening of “The Most Unknown” documentary film, 18 Jan 2019
- 2018            Panel discussion, Kavli Conversations on Science Communication at **NYU**, 15 Nov 2018
- 2018            **Motherboard (Vice Media)**, 20 July 2018, story [here](#)
- 2018            Award-winning **Netflix** documentary film “[The Most Unknown](#)” funded by NASEM Science Sandbox (Ian Cheney director/producer, Werner Herzog consulting producer)
- 2017            **Christian Science Monitor**, 1 Dec 2017, quoted [here](#):
- 2017            **New Scientist** quoted me in [Beall, Abigail. *New Scientist*. 7/29/2017, Vol. 235 Issue 3136, p7-7. 1p. 1 Color Photograph. DOI: 10.1016/S0262-4079(17)31447-1.]
- 2016            **EU Parliament** [Arctic research film](#) (password “Polar01”) played in museums throughout the EU including Brussels, Berlin and Paris.
- 2013            **BBC** (Europe) and **Science Channel** (N. America) documentary film [Richard Hammond's How to Build a Universe](#) featured my astrobiology research
- 2013            **PBS International** NASA-funded documentary film profiled 4 scientists engaged in [The Search for the Origin of Life](#)

2010 **National Geographic Magazine** [cover story](http://www.nationalgeographic.com/explorers/projects/blue-holes/) August 2010 featured my research on the microbiology of sinkholes. Published online at <http://www.nationalgeographic.com/explorers/projects/blue-holes/>.

## ***Service (selected)***

**Peer reviews for:** National Academy of Sciences, Engineering, and Medicine (NASEM), Science, Proceedings National Academy of Sciences, ISME Journal (NPG), Geology, Geobiology, Geochimica et Cosmochimica Acta, Environmental Microbiology, Frontiers in Microbiology, Astrobiology, Chemical Geology, GSA Special Papers, Reviews in Environmental Science and Biotechnology, Journal of Geophysical Research, Journal of Cave and Karst Studies, FEMS Microbiology Ecology, National Speleological Society Publications, Extremophiles, Hydrobiologia, International Journal of Speleology, Blackwell Publishing

**Proposal reviews for:** Department of Energy, NASA ASTEP, NSF EAR (PF), NSF BIO (Biocomplexity), NSF/USDA Genomics, NSF EAR (Biogeosciences), NSF BIO (Microbial Observatories), NSF EAR (Earthscape), NASA (Exobiology), NSF EAR (Geology and Paleontology), NSF EAR (Geobiology and Low-Temp Geochemistry), NASA (Astrobiology Institute), NSF BIO (Molecular and Cellular Biology), NSF BIO (Emerging Frontiers), NSF EAR (Instrumentation & Facilities), NSF EPSCOR, U.S. Geological Survey

**Steering committee,** NSF Carbonate Critical Zone Research Coordination Network

**Co-Director,** Karst Waters Institute

### **Conference Organizer:**

- Karst Waters Institute Frontiers in Karst Conference and Field Trip on Sulfuric Acid Weathering, San Vittore, Italy, 2-7 June, 2020
- NSF Research Coordination Network Virtual Workshop on Karst in the Critical Zone, Aug. 3-6, 2020
- EMBO Workshop on Microbial Sulfur Metabolism, Vienna 2018
- Anaerobic Phototrophic Ecosystems: Ancient & Modern, Conference and Field Workshop at Fayetteville Green Lake, NY, Oct. 12-14, 2010
- Sulfidic Karst Ecosystems Field Workshop, Sept. 13-16, 2009, Genga, Italy

### **Session Convener:**

- Critical Zone Dynamics through Space and Time: Linkages with Weathering Rates and Global Biogeochemical, Goldschmidt Conference, Boston, MA, 2018
- From Genes to Geochemistry: Integrating Environmental and Biological Datasets to Unearth Novel Microbial Metabolisms and Chemical Processes, Goldschmidt Conference, Sacramento, CA, 11 June 2014
- Phototrophic Life and Earth's Redox Evolution, Goldschmidt Conference, Florence, Italy, 26 Aug 2013
- Microbial Sulfur Transformations: Past, Present, and Away, Goldschmidt Meeting, Knoxville, TN, June 13-18, 2010
- Geomicrobiology of Redox Stratified Ecosystems, Goldschmidt Meeting, Knoxville, TN, June 13-18, 2010

- Biogeochemistry at the Limits of Habitability, American Chemical Society (ACS) Annual Meeting, Spring 2005.

## ***Publications (60)***

Citations: >3350 h-index: 29

\*publications by mentees

Ayala-Muñoz, D.\*, W. D. Burgos, J. Sánchez-España, E. Couradeau, C. Falagán, and J. L. Macalady. 2020. Metagenomic and metatranscriptomic study of microbial metal resistance in an acidic pit lake, *in press at Microorganisms*.

Ayala-Muñoz, D.\*, Simister, R., Crowe, S., Macalady, J. L., and W. Burgos. 2020. Metagenomics reveal functional redundancy and hysteresis in community assembly, *in press at Environmental Microbiology*.

Klatt, Judith M., Gonzalo V. Gomez-Saez, Steffi Meyer, Petra Pop Ristova, Pelin Yilmaz, Michael Granitsiotis, Jennifer L. Macalady, Gaute Lavik, Lubos Polerecky, Solveig I. Bühring. 2020. Versatile cyanobacteria control the timing and extent of sulfide production in a Proterozoic analog microbial mat, *in press at ISME Journal*.

Nguyen, U.T.\*, S. Lincoln, A. G. Valladares Juárez, M. Schedler, J. L. Macalady, R. Müller, and K. H. Freeman. 2018. Influence of pressure on hydrocarbon biodegradation in the shallow and deep Gulf of Mexico sediments. *PLOS One 13 (7), e0199784*.

Haas, S.\*, de Beer, D., Fink, A., Klatt, J. M., McCauley Rench, R. L.\*, Hamilton, T.L.\*, Kakuk, B., and Macalady, J. L. 2018. Low-light Anoxygenic Photosynthesis and Fe-S-Biogeochemistry in a Microbial Mat. *Frontiers in Microbiology 9:858-873*.

Hamilton, T.L.\*, Klatt, J. M., de Beer, D., and Macalady, J. L. 2018. Cyanobacterial photosynthesis under sulfidic conditions: insights from the isolate *Leptolyngbya* sp. strain hensonii. *ISME Journal 12: 568-584*.

Sheng, Y., K. J. Bibby, C. L. Grettenberger\*, B. Kaley, J. L. Macalady, G. Wang, and W. D. Burgos. 2017. Bioreactors for low-pH iron(II) oxidation remove considerable amounts of total iron. *RSC Advances 7:35962–35972*.

Hamilton, T. L.\*, P. V. Welander, H. L. Albrecht\*, J. M. Fulton, I. Schaperdoth\*, L. Bird, R.E. Summons, K. H. Freeman, and J. L. Macalady. 2017. Microbial communities and organic biomarkers in a Proterozoic-analog sinkhole, *Geobiology 15(6): 784-797, DOI:10.1111/gbi.12252*.

Mansor, M.\* K. Harouaka, U. Nguyen\*, J. L. Macalady, M. S. Fantle. 2017. Sulfur isotopic fractionation on sulfidic cave walls, Frasassi caves, Italy. *Astrobiology 18 (1): 59-72*.

De Beer, D., Weber, M., Klatt, J., Hamilton, T.L.\*, Lott, C., Chennu, A. and J.L. Macalady. 2016. Oxygenic and anoxygenic photosynthesis in a microbial mat from an anoxic and sulfidic spring. *Environmental Microbiology 19 (3):1251-1265, doi:10.1111/1462-2920.13654*.

Grettenberger, C. L.\*, Pearce, A. R.\*, Bibby, K.J., Jones, D.S.\*, Burgos, W. D., and Macalady, J. L. 2017. Efficient low-pH iron removal by a microbial iron oxide mound ecosystem at Scalp Level Run. *Applied and Environmental Microbiology 83 (7), doi:10.1128/AEM.00015-17*.



Sheng, Y., B. Kaley, K. Bibby, C.L. Grettenberger\*, J. L. Macalady, G. Wang, and W. Burgos. 2016. Geochemical and temporal influences on the enrichment of acidophilic iron-oxidizing bacterial communities. *Applied and Environmental Microbiology* 82(12): 3611-3621.

Jones, D.S.\* , Schaperdoth, I.\* and Macalady, J. L. 2016. Biogeography of *Acidithiobacillus* populations in extremely acidic subaerial cave biofilms. *ISME Journal* 10(12):2879-2891, doi: 10.1038/ismej.2016.74.

Mansor, M.\* , Schaperdoth, I.\* and Macalady, J. L. 2016. Draft Genome of Lampenflora *Chlorobium limicola* strain Frasassi in a Sulfidic Cave System. *Genome Announcements* 4(3): e00357-16.

Harouaka, K., Mansor, M.\* , Macalady, J. L. and Fantle, M.S. 2016. Calcium isotopic fractionation in microbially mediated gypsum precipitates, *Geochimica Cosmochimica Acta* 184:114-131, doi:10.1016/j.gca.2016.03.003.

Hamilton, T. L.\* , Bovee, R. J., Sattin, S.R., Mohr, W., Schaperdoth, I.\* , Gilhooly, W. P. III, Lyons, T. W., Pearson, A., and Macalady, J. L. 2016. Carbon and sulfur cycling below the chemocline in a meromictic lake and the identification of a novel taxonomic lineage in the FCB superphylum, Candidatus Aegiribacteria, *Frontiers in Microbiology* 7 : 598.

Zerkle, A. L., Jones, D.S.\* , Farquhar, J. and Macalady, J.L. 2016. Sulfur isotope values in the sulfidic Frasassi cave system, central Italy: A case study of a chemolithotrophic S-based ecosystem, *Geochimica et Cosmochimica Acta* 173 (15): 373–386, doi:10.1016/j.gca.2015.10.028.

Hamilton, T.L.\* , Bryant, D. A. and Macalady, J. L. 2016. The role of biology in planetary evolution: cyanobacterial primary production in low oxygen Proterozoic oceans [invited review], *Environmental Microbiology* 18(2): 325–340. doi:10.1111/1462-2920.13118.

Klatt, J. M., Meyer, S., Haeusler, S., Macalady, J. L., de Beer, D., and Polerecky, L. 2015. Structure and function of natural sulphide oxidizing microbial mats under dynamic input of light and chemical energy, *ISME Journal* 10(4): 921–933, doi:10.1038/ismej.2015.167.

Mansor, M.\* , Hamilton, T.L.\* , Fantle, M.S. and Macalady, J. L. 2015. Metabolic diversity and ecological niche of *Achromatium* populations revealed with single-cell genomic sequencing, *Frontiers in Microbiology* 6: 822, Published online 2015 Aug 10. doi:10.3389/fmicb.2015.00822

Jones, D.S.\* , Polerecky, L., Galdenzi, S., Dempsey, B. and Macalady, J. L. 2015. Fate of sulfide in the Frasassi cave system and implications for sulfuric acid speleogenesis (SAS), *Chemical Geology* 410: 21-27, <http://dx.doi.org/10.1016/j.chemgeo.2015.06.002>.

Lincoln, S.A.\* , Hamilton, T.L.\* , Valladares Juárez, A.G., Schedlerb, M., Macalady, J. L., Müller, R., and Freeman, K.H. 2015. Draft genome sequence of the piezotolerant, crude oil-degrading bacterium *Rhodococcus qingshengii* strain TUHH-12, *Genome Announcements* March/April 2015; 3: doi:10.1128/genomeA.00268-15.

Jones, D. S.\* , Kohl, C., Grettenberger, C.\* , Larson, L. N.\* , Burgos, W. D. and Macalady, J.L. 2015. Geochemical niches of Fe-oxidizing acidophiles in an acidic coal mine drainage, *Applied and Environmental Microbiology* 81(4): 1242-1250, doi: 10.1128/AEM.02919-14.  
[journal cover](#)

Hamilton, T.L.\*, Jones, D.S.\*, Schaperdoth, I.\*, and Macalady, J. L. 2015. Metagenomic insights into S(0) precipitation in a terrestrial subsurface lithoautotrophic ecosystem, Frontiers in Microbiology 5 (756): 16 pp., doi: 10.3389/fmicb.2014.00756.

Hamilton, T. L. \*, Bovee, R. J., Thiel, V., Sattin, S.R., Mohr, W., Schaperdoth, I.\*, Vogl, K., Gilhooly, W. P. III, Lyons, T. W., Tomsho, L. P., Schuster, S. C., Overmann, J., Bryant, D.A., Pearson, A., and Macalady, J. L. 2014. Coupled reductive and oxidative sulfur cycling in the phototrophic plate of a meromictic lake. Geobiology 12(5): 451-468, DOI: 10.1111/gbi.12092.

Jones, D. S.\*, Schaperdoth, I.\* and Macalady, J. L. 2014. Metagenomic evidence for sulfide oxidation in extremely acidic cave biofilms. Geomicrobiology Journal 31: 194-204.

Dawson, K. S.\*, Schaperdoth, I.\*, Freeman, K. H., and Macalady, J. L. 2013. Anaerobic biodegradation of the isoprenoid biomarker analogues pristane and phytane. Organic Geochemistry 65: 118-126.

Larson, L. N., Fitzgerald, M., Singha, K., Gooseff, M. N., Macalady, J. L. and Burgos, W. D. 2013. Hydrogeochemical niches associated with hyporheic exchange beneath an acid mine drainage-contaminated stream. Journal of Hydrology 501: 163-174.

Macalady, J. L., Hamilton, T. L.\*, Grettenberger, C. L.\*, Jones, D. S.\*, Tsao, L. E.\* and Burgos, W. D. 2013. Energy, ecology, and the distribution of microbial life. Philosophical Transactions Royal Society B 368: 20120383.

Maresca, J., Crowe, S. and Macalady, J. L. 2012. Guest Editorial: [Special Issue](#) on Anaerobic Photosynthetic Ecosystems. Geobiology 10 (3): 193-195 .

Dawson, K. S.\*, Freeman, K. H., and Macalady, J. L. 2012. Molecular characterization of core lipids from halophilic archaea grown under different salinity conditions. Organic Geochemistry 48:1-8.

Dawson, K. S.\*, Strapoc, D., Huizinga, B., Lidstrom, U., Ashby, M. and Macalady, J. L. 2012. Quantitative FISH analysis of microbial consortia from a biogenic gas field in the Cook Inlet Basin, Alaska. Applied & Environmental Microbiology 78 (10): 3599-3610.

Jones, D. S.\*, I. Schaperdoth\*, T. S. Stoffer\*, K.S. Dawson\*, K. H. Freeman, H.A. Albrecht\*, and Macalady, J. L. 2012. Community genomic analysis of an extremely acidophilic sulfur-oxidizing biofilm. ISME Journal 6: 158-170, doi:10.1038/ismej.2011.75

Gonzalez, B. C., Iliffe, T. M., Macalady, J. L., Schaperdoth, I.\*, and Kakuk, B. 2011. Microbial hotspots in anchialine blue holes: initial discoveries from the Bahamas. Hydrobiologia 677: 149-156.

Meyer, K., Freeman, K. H. , Macalady, J. L. , Fulton, J., Schaperdoth, I.\*, and Kump, L. 2011. Carotenoid biomarkers as an imperfect reflection of the anaerobic phototrophic community in meromictic Fayetteville Green Lake. Geobiology 9: 321-329.

Strapoc, D., Mastalerz, M., Dawson, K.S.\*, Macalady, J. L., Callaghan, A., Wawrik, B., and Ashby, M. 2011. Biogeochemistry of Coal Bed Methane [*invited*]. Annual Review of Earth and Planetary Science 39: 617-656.

Brown, J. F., Jones, D. S.\*, I. Schaperdoth\*, Macalady, J. L. and Burgos, W. 2011. Role of environmental gradients and depositional facies in controlling acid mine drainage microbiology and precipitation kinetics. Applied and Environmental Microbiology 77: 545-554.

Jones, D. S.\*, Tobler, D.\*, Schaperdoth, I.\*, Mainiero, M., and Macalady, J. L. 2010. Community structure of subsurface biofilms from the thermal sulfidic caves of Acquasanta Terme, Italy. Applied and Environmental Microbiology 76 (17): 5902-5910.

Moore, J., Macalady, J. L., Schulz, M. S., White, A. F., and Brantley, S. L. 2010. Shifting microbial community structure across a marine terrace grassland chronosequence, Santa Cruz, California. Soil Biology and Biochemistry 42(1): 21-31.

Dattagupta, S.\*, Schaperdoth, I.\*, Montanari, A., Mariani, S., Kita, N., Valley, J. W. and Macalady, J. L. 2009. A recently evolved symbiosis between chemoautotrophic bacteria and a cave-dwelling amphipod. ISME Journal 3: 935-943.

Macalady, J. L., S. Dattagupta\*, I. Schaperdoth\*, G. K. Druschel, D. Eastman. 2008. Niche differentiation among sulfur-oxidizing bacterial populations in cave waters. ISME Journal 2: 590-601, doi:10.1038/ismej.2008.25.

Strapoć, D., F. Picardal, C. Turich, I. Schaperdoth\*, J. L. Macalady, J. Lipp, Y.-S. Lin, T. Mohr, F. Schuboltz, K.-U. Hinrichs, M. Mastalerz, A. Schimmelmann. 2008. Coal bed methane-producing microbial community in the Illinois Basin. Applied and Environmental Microbiology 74(8): 2424-2432.

Ewing, S. A., McKay, C. P., Warren-Rhodes, K., Macalady, J. L., and Amundson, R. 2008. Changes in the soil C cycle at the arid-hyperarid transition in the Atacama Desert. Journal of Geophysical Research 113: G02S90, doi:10.1029/2007JG000495.

Jones, D. S.\*, Lyon, E. H.\*, and Macalady, J. L. 2008. Geomicrobiology of sulfidic cave biovermiculations. Journal of Cave and Karst Studies 70 (2): 78-93.

Ewing, S. A., Michalski, G., Thiemens, M. H., Quinn, R. C. , Macalady, J. L., Kohl, S., Wankel, S. D. , Kendall, C., McKay, C. P., and Amundson, R. 2007. The Rainfall Limit of the Nitrogen Cycle on Earth. Global Biogeochemical Cycles 21: GB3010, doi:10.1029/2006GB002734.

Macalady, J. L., D. S. Jones and E. H. Lyon. 2007. Extremely acidic, pendulous microbial biofilms from the Frasassi cave system, Italy. Environmental Microbiology 9(6): 1402-1414.

Ewing, S. A., R. J. Southard, J. L. Macalady, A. S. Hartshorn and M. J. Johnson. 2007. Localization of soil microbial community fingerprints, carbon, and nitrogen in a Mojave Desert creosote bush ecosystem. Soil Science Society of America Journal 71 (2): 469-475.

Macalady, J. L., E. H. Lyon, B. Koffman, L. K. Albertson, K. Meyer, S. Galdenzi and S. Mariani. 2006. Dominant microbial populations in limestone-corroding stream biofilms, Frasassi cave system, Italy. Applied and Environmental Microbiology 72 (8): 5596-5609.

Macalady, J. L., M. M. Vestling, D. Baumler, N. Boekelheide, C.W. Kaspar, and J. F. Banfield. 2004. Membrane monolayers in *Ferroplasma* spp.: a key to survival in acid. Extremophiles 8(5): 411-419.

Macalady, J. L., and J. F. Banfield. 2003. Molecular geomicrobiology: genes and geochemical cycling [*invited Frontiers review*]. Earth and Planetary Science Letters 209 (1-2): 1-17.

Costello, A.M., A. J. Auman, J. L. Macalady, K. M. Scow, and M. E. Lidstrom. 2002. Estimation of Methanotroph Abundance in a Freshwater Lake Sediment. Environmental Microbiology 4(8): 443-450.

Macalady, J. L., A. M. S. McMillan, A. F. Dickens, S. C. Tyler and K. M. Scow. 2002. Population dynamics of Type I and II methanotrophic bacteria in rice soils. Environmental Microbiology 4(3): 148-157.

Macalady, J. L., E.E. Mack, D.C. Nelson and K.M. Scow. 2000. Sediment microbial community structure and mercury methylation in mercury-polluted Clear Lake, CA. Applied and Environmental Microbiology 66 (4):1479-1488.

Hanson, J.R., J. L. Macalady, D. Harris and K.M. Scow. 1999. Linking toluene degradation with specific microbial populations in soil. Applied and Environmental Microbiology 65 (12):5403-5408.

Macalady, J. L., M.E. Fuller and K.M. Scow. 1998. Effects of metam sodium fumigation on soil microbial activity and community structure. Journal of Environmental Quality 27:54-63.

### ***Books or Parts of Books (8)***

Macalady, J.L. 2018. The Frasassi Gorge Caves. 2018. *Encyclopedia of Caves*, 3rd ed., pp. xxx-xxx (in press), eds. W. White, D. Culver, and T. Pipan, Elsevier Academic Press.

Macalady, J.L. 2018. Do Microbes Make Caves? Fifteen Years at Frasassi. 2018. *Memorie dell'Istituto Italiano di Speleologia*, S. 2, XXXIII, pp. 163-172.

Jones, D.S.\* and Macalady, J. L. 2016. The snotty and the stringy: energy for subsurface life in caves, Ch. 5 in Advances in Environmental Microbiology, "Their World: a Diversity of Microbial Environments", ed. by C.J. Hurst, Springer DE, Heidelberg, Germany.

Galdenzi, S., Jones, D. S.\*, and Macalady, J. L. 2014. Condensation corrosion: measurements and geomorphic evidence in the Frasassi Caves, Karst Waters Institute Special Publication 18 (Hypogene Cave Morphologies): 44-46.

Summers Engel, A., Northup, D., Gary, M. Gonzalez, B., Gonzalez, J. Hutchens, E., Jones, D., Macalady, J., Spear, J. and Spilde, M. 2008. Caves and Karst as Model Systems in Geomicrobiology, *In* Martin, J.B. and White, W.B. (eds.), 2008, *Frontiers of Karst Research*. Special Publication 13, Karst Waters Institute, Leesburg, Virginia.

Hose, L. D. and Macalady, J. L. 2006. Observations from active sulfidic karst systems: Is the present the key to understanding Guadalupe Mountain speleogenesis? 57<sup>th</sup> annual Field Conference Guidebook: New Mexico Geological Society, Socorro, NM.

Lyon E.\*, Koffman B.\*, Meyer K.\*, Cleaveland L., Mariani S., Galdenzi S., and J. L. Macalady. 2004. Geomicrobiology of the Frasassi Caves. *In* Frasassi 1989-2004: Gli sviluppi nella ricerca (S. Galdenzi, ed.), pp. 152-157.

Scow, K. M., E. Schwartz, M.J. Johnson and J.L. Macalady. 2000. Measurement of microbial biodiversity, *In* Encyclopedia of Biodiversity, Levin, S. A. (Sr. ed.), Academic Press, Inc.

## ***Selected Conference Abstracts (out of 147)***

Cosmidis, J.\*, Kamermans, B., **Macalady, J.L.** 2020. The role of extracellular organics in microbial sulfur formation, American Chemical Society, Philadelphia, USA.

Aronson, H. S., **J. L. Macalady** and J.P. Amend. 2019. A novel sulfur catabolism ‘missing in nature’, American Geophysical Union Annual Meeting, xxx, San Francisco, CA

Aronson, H. S., **J. L. Macalady** and J.P. Amend. 2019. Sulfur Comproportionation and Sulfur Disproportionation in the Frasassi karst, Italy, American Geophysical Union Annual Meeting, xxx, San Francisco, CA

Jones, D. S.\* **J. L. Macalady**. 2019. Global biogeography and diversity of extremely acidic cave-dwelling communities, Geological Society of America Annual Meeting, Phoenix, AZ 23-28 September 2019.

Cosmidis, J.\* [*invited*], C. Nims, J. Lafond, B. Cron, **J.L. Macalady**, and A. Templeton. 2019. How to fabricate a microfossil: new insights on the formation and preservation of false microbial biosignatures in the rock record, Geological Society of America Annual Meeting, Phoenix, AZ 23-28 September 2019.

Chan, C. S.\* [*invited*], S. M McAllister, R. Vandzura P.A. Henri, M. Pavia, S. W. Polson, and **J.L. Macalady**. 2019. How do microbes make minerals in the environment? Tracking iron and sulfur biomineralization using comics and microscopy, Goldschmidt Abstracts 2019, Goldschmidt Conference, Barcelona, Spain

Ayala, D.\*, J. Sánchez-España, S. Crowe, **J.L. Macalady**, and W. Burgos. 2019. Comparative genomic and transcriptomic investigation of an acidic pit lake in the Iberian Pyrite Belt, Goldschmidt Abstracts 2019, Goldschmidt Conference, Barcelona, Spain

**Macalady, J.L.\*** [*keynote*]. 2019. Biofilms in caves are calling your name, Goldschmidt Abstracts 2019, Goldschmidt Conference, Barcelona, Spain

**Macalady, J.L.\*** [*keynote*]. 2019. Sulfuric acid weathering underground, Goldschmidt Abstracts gold2019:abs:2019005628, Goldschmidt Conference, Barcelona, Spain.

Amend, J. P.\* [*invited*], Aronson, H. S. , LaRowe, D. E. and **Macalady, J.L.**. 2019. Is sulfur comproportionation a catabolism ‘missing in nature’?, Goldschmidt Abstracts 2019, Goldschmidt Conference, Barcelona, Spain

Amend, J. P.\* [*invited*], Aronson, H. S., LaRowe, D. E. and **Macalady, J.L.**. 2019. Catabolisms ‘Missing in Nature’, Astrobiology Science Conference, Seattle, WA, USA

**Macalady, J.L.\*** & Jones D.S. 2018. Mapping the composition of subsurface acidophile biofilms, 12th International Congress of Extremophiles, Naples, Italy, 16-20 Sept.

**Macalady, J.L.\*** [*invited*], Mansor M, Cosmidis J, Jones D, McCauley Rench R & Fantle M. 2018. Minerals and Microbes in a Euxinic Ecosystem, Goldschmidt Abstracts 2018, Goldschmidt Conference, Boston, USA, 13-18 Aug.

Kamermans, B.\* , Cosmidis, J., **Macalady, J.L.**, and Templeton, A. 2018. Evaluation of S(0) as a biosignature in laboratory and field experiments, Goldschmidt Abstracts 2018, Goldschmidt Conference, Boston, USA, 13-18 Aug.

Cosmidis, J.\* , Nims, C., Kamermans, B., **Macalady, J.L.**, and Templeton, A. 2018. S(0) formation mechanisms in the Proterozoic ocean – potential signatures in the rock record, Goldschmidt Abstracts 2018, Goldschmidt Conference, Boston, USA, 13-18 Aug.

Nguyen, U.T., Sara A. Lincoln, Ana Gabriela Valladares Juárez, Martina Schedler, **Jennifer L. Macalady**, Rudolf Muller, and Katherine H. Freeman. 2018. The influence of pressure on hydrocarbon-degrading bacteria in shallow and deep Gulf of Mexico sediments, Gulf of Mexico Oil Spill & Ecosystem Science Conference, New Orleans, Feb. 5-8.

**Macalady, J.L.\*** [*invited*], Mansor, M., Kamermans, B., Fantle, M., and Cosmidis, J. 2018. Biogeochemical rates in a dark sulfuretum, American Chemical Society Meeting, New Orleans, 13 March.

**Macalady, J.L.\*** 2017. Vadose Drip Slimes at Wishing Well Cave, Burnsville Cove, VA, Friends of Karst Mini-symposium, Morgantown, WV, Nov. 10

**Macalady, J.L.\*** [*keynote*] 2017. Microbes Never Die — Lessons in Geochemistry and Astrobiology from 15 Years at Frasassi, Geological Society of America Penrose Conference, Aipiro, Italy, September 25-29.

**Macalady, J.L.\***, K. Mankoff, S. Lutz, and L.G. Benning. 2017. Novel microbial communities in subglacial (dark) permafrost. Goldschmidt Conference, Paris, France, 13-18 Aug.

Mansor, M., **J.L. Macalady**, M.S. Fantle\*. 2017. Isotopic spatial patterns as biosignatures. Goldschmidt Conference, Paris, France, 13-18 Aug.

Henri, P.A.\* , C.S. Chan, **J.L. Macalady**, S.M. Webb, and A. Steele. 2017. Elucidating the role of chemolithotrophic sulphide-oxidizers in the formation of S(0) deposits. Goldschmidt Conference, Paris, France, 13-18 Aug.

Cardman, Z., S. Lovrinic, I. Schaperdoth, M. Mainiero, S. Mariani, and **J. Macalady\***. 2017. Microbial architects of anastomosing cave wall patterns in Frasassi, Italy. Goldschmidt Conference, Paris, France, 13-18 Aug.

Nguyen, U.T.\* , **J. Macalady**. 2017. Co-metabolic stimulation of anaerobic coal bioconversion using a phenanthrene-degrading enrichment. Goldschmidt Conference, Paris, France, 13-18 Aug.

Cosmidis, J.\* [*keynote*], Alexis Templeton, Karim Benzerara, Ferial Skouri-Panet, Elodie Duprat, and **J. Macalady**. 2017. Chemistry versus biology – “true” and “false” biosignatures formed through biomineralization and organomineralization processes, Goldschmidt Conference, Paris, France, 13-18 Aug.

Clark, C.E.\* , Polerecky, L., and **Macalady, J.L.** 2017. Interactions among S, Fe, and C cycles in the turbulently mixed surface zone of a micro-oxic and sulfidic aquifer, Goldschmidt Conference, Paris, France, 13-18 Aug.

Nguyen, U.T.\*, Sara Lincoln, Ana Gabriela Valladares Juárez, Martina Schedler, **J.L. Macalady**, Rudolf Müller, and Katherine Freeman. 2017. Influence of pressure on hydrocarbon biodegradation in the shallow and deep Gulf of Mexico sediments, GoM Oil Spill and Ecosystem Conference, February

Chan, C.S.\* [*invited*], Henri, P.A., Marnocha, C.L., Levy, A.T., Hanson, T.E., Steele, A., and **Macalady, J.L.** 2016. Elemental sulfur biomineralization by phototrophs and chemolithotrophs: model isolates and field studies, American Geophysical Union Fall Conference, San Francisco

Hamilton, T. L.\* [*invited*], de Beer, D., Klatt, J., **Macalady, J. L.**, Weber, M., Lott, C. and Chennu, A. 2016. Model photoautotrophs isolated from a Proterozoic ocean analog - aerobic life under anoxic conditions. American Geophysical Union Fall Conference, San Francisco

Clark, C.E.\*, Polerecky, L., and **Macalady, J.L.**. 2016. Fate of zero-valent sulfur in shallow sediments below cave *Beggiatoa* mats, International Society for Microbial Ecology Conference, Montreal, Canada, 22-26 Aug.

**Macalady, J.L.\***, T.L. Hamilton, I. Schaperdoth, J.-L. Gonzalez Pimentel, and M. Mainiero. 2016. Sulfur Cycling Community in a thermal aquifer, Acquasanta karst complex, International Society for Microbial Ecology Conference, Montreal, Canada, 22-26 Aug.

Nguyen, U.T.\*, Sara Lincoln, Ana Gabriela Valladares Juarez, Martina Schedler, **Jennifer Macalady**, Rudolf Müller, and Katherine Freeman. 2016. Biodegradation of crude oil in shallow and deep Gulf of Mexico sediments, Organic Geochemistry Gordon Conference, Holderness, NH, 24-29 July.

Labrado, A.\* , Tsao, L., Hamilton, T. L. and **Macalady J. L.** 2016. Coupled microbial nitrate reduction and sulfur oxidation in a sulfidic cave system, Astrobiology Graduate Conference, Boulder, CO, 24-27 July

Mansor, M.\* , K. Harouaka, **J.L. Macalady**, and M.S. Fantle. 2016. Oxidative sulfur isotope fractionation on sulfidic cave walls. Goldschmidt Conference, Yokohama, Japan, 26 Jun - 1 July.

Grettenberger, C. L., Rebecca L. McCauley Rench, Daniel Mills, Danielle Gruen, Colin Carney, Jamie Brainard, Hiroshi Hamasaki, Yumiko Watanabe, Hiroshi Ohmoto, and **J.L. Macalady\***. 2016. Geomicrobiology of a stratified, acidic pit lake in the Iberian Pyrite Belt. Goldschmidt Conference, Yokohama, Japan, 26 Jun - 1 July.

Beatty, D. W.\* , Niles, P. B., Bass, D. S., Bell, M. S., Bleacher, J. E., Cabrol, N. A., Conrad, P. G., Eppler, D. B., Hamilton, V. E., Hays, L. E., Head, J. W., Kahre, M. A., Levy, J. S., Lyons, T. W., **Macalady, J. L.**, Rafkin, S. C. R., Rice, J. W. and Rice, M. S. (2015) Planning Ahead for Mars Sample Science in the Human Exploration Era. *Meteoritics and Planetary Science* 50 (S1). Art. No. 5335.

Grettenberger, C. L.\* , Pearce, A. R., Jones, D. S., Burgos, W. D., Bibby, K. J. and **Macalady, J.L.** 2015. Dominance of *Ferritrophicum* populations at an AMD site with rapid iron oxidation. American Geophysical Union Annual Meeting, San Francisco, CA, 14-17 Dec.

Labrado, A.\* , Tsao, L., Hamilton, T. L. and **Macalady J. L.** 2015. Microbial influence on elemental sulfur production and consumption in a sulfidic cave system. Geological Society of America Annual Meeting, Baltimore, MD, 1-4 Nov.

**Macalady, J.L.\* [invited]**, Lovrinic, S., Cardman, Z., Schaperdoth, I., Mainiero, M. and Mariani, S. 2015. Origin and geomicrobiology of maze-like cave wall formations, Geological Society of America Annual Meeting, Baltimore, MD, 1-4 Nov.

Cardman, Z., **Macalady, J.L.\* [invited]**, Schaperdoth, I., Broad, K., and Kakuk, B. 2015. Fast-growing slime curtains reveal a dynamic nitrogen (and iron?) world in the shallow subsurface, Geological Society of America Annual Meeting, Baltimore, MD, 1-4 Nov.

Mansor, M.\* , M.S. Fantle, **J.L. Macalady**. 2015. Biogenic pyrite formation in euxinic subsurface lakes of the Frasassi caves, Italy. Goldschmidt Conference, Prague, 16-21 Aug.

Hamilton T.L.\* , Jones, D.S., Tsao, L., Schaperdoth, I. and **Macalady, J.L.** 2014. Metagenomic insights into S(0) precipitation in a terrestrial subsurface lithoautotrophic ecosystem, American Geophysical Union Annual Meeting, San Francisco, CA, 15-19 Dec.

Mansor, M.\* , C. Grettenberger, M.S. Fantle, **J.L. Macalady**. 2014. Characterization of phases and Fe isotopes of iron sulfide minerals in a microbial gradient culture. Goldschmidt Conference, Sacramento, CA, June 8-13.

Hamilton T.L.\* , Klatt, J. M., Bird, L.M., Freeman, K.H., de Beer, D., **Macalady, J.L.** 2014. A Metabolically Versatile Cyanobacterium and the Low-Oxygen Proterozoic World, Goldschmidt Conference, Sacramento, CA, 8-13 Jun.

Grettenberger, C.L\*., Pearce, A., **Macalady, J.L.**, Burgos, W., Bibby, K. 2014. Microbial Communities at a Highly Efficient Acid Mine Drainage Site. Goldschmidt Conference, Sacramento, CA, June 8-13.

Lincoln, S.A.\* , Valladares Juárez, A.G., Schedler, M., Kadimesetty, H.S., Müller, R., **Macalady, J.**, and Freeman, K.H. 2014. Hydrocarbon biodegradation and bacterial succession in surface and seafloor pressure incubations. Goldschmidt Conference, Sacramento, CA, June 8-13.

## ***Other Invited Lectures***

2020

University of California San Diego, Scripps Oceanographic Institution Seminar, Nov 2020  
University of Minnesota, Geology Department Colloquium, April 2020  
University of Pennsylvania Geoscience Colloquium, 24 Jan 2020

2019

Barry Blumberg Memorial Astrobiology Workshop, Green Bank Observatory, Green Bank, WV, 20-23 July 2019  
National Academy of Sciences and Engineering (NASEM) Science Documentary Filmmakers Workshop  
New Mexico Tech/National Center for Cave and Karst Research Seminar, 19 Sept 2019  
Montana State University, Center for Biofilm Engineering Seminar, 5 March 2019

2018

Michigan State University, Department of Earth and Environmental Sciences Distinguished Speaker, 7 Sep 2018



2017

Penrose Conference keynote, 25 Sep 2017, Apiro, Italy  
Princeton University, EGGS, 6 Apr 2017, Princeton, NJ  
University of Georgia, Department of Marine Sciences, 3 Apr 2017  
Penn State University, Geosciences Department Geochemistry Forum, 17 Mar 2017  
International Symposium of Speleology, Varenna, Italy, April 29-May 1, 2017  
Southeastern Biogeochemistry Symposium [Keynote], Athens, GA, March 31- April 2, 2017

2016

Ohio State University, Department of Microbiology, 30 Nov 2016  
Penn State University, Department of Astronomy & Astrophysics, 21 Sep 2016  
Penn State University, Center for Infectious Disease Dynamics (CIDD), 8 Sep 2016

2015

International Workshop on Microbial Life under Extreme Energy Limitation, Sandbjerg,  
Denmark, 21-25 September 2015  
Deep Carbon Observatory Data Visualization and Modeling Workshop, May 2015

2014

Centro de Astrobiologia (CAB), Madrid, Spain, 11 Feb 2014  
Spanish National Museum of Natural Science, Biogeography and Global Change group, 7  
Feb 2014  
Penn State Center for Exoplanets and Habitable Worlds, 25 Aug 2014

2013

Harvard University, Microbial Sciences Initiative, 14 Nov 2013  
HYDRA Institute, Fetovaia, Italy, 29 Aug 2013  
University of Miami, Abess Center for Ecosystem Science and Policy, 11 Feb 2013

2012

Royal Society Discussion Meeting on Energy Transduction and Genome Function, London,  
England, 11-14 November 2012  
Lehigh University, Sigma Xi Annual Award Lecture, 9 Apr 2012,  
Rensselaer Polytechnic Institute, New York Center for Astrobiology, 13 Feb 2012  
National Academy of Science, Engineering, & Medicine Kavli Frontiers of Science  
Symposium, Newport Beach, CA, Nov. 1-4.

2011

Arizona State University, School of Earth and Space Exploration, 20 Apr 2011  
Arizona State University, Astrobiology Center, 20 Apr 2011  
University of Washington, Astrobiology Seminar, 29 Mar 2011

2010

NASA Astrobiology Institute, Director's Seminar, 29 Nov 2010

2009

- Cornell University, Biogeochemistry and Environmental Biocomplexity Program, Spring 2009
- 2008  
University of Maine, Earth Sciences Department, Fall 2008
- 2007  
Karst Waters Institute Workshop, Spring 2007, San Antonio, TX
- 2005  
University of Delaware, Biotechnology Institute, Fall 2005
- 2004  
University of Minnesota Twin Cities, Department of Geology, Spring 2004  
University of Wisconsin Madison, Department of Geology and Geophysics, Spring 2004
- 2003  
University of Minnesota Twin Cities, Soil, Water and Climate Department, Spring 2003
- 2001  
University of Wisconsin Madison, Department of Geology and Geophysics, Fall 2001  
Rensselaer Polytechnic Institute, Department of Earth and Environmental Sciences, Fall 2001  
Colorado State University, Department of Soil and Crop Sciences, Spring 2001  
Columbia University Biosphere 2 Center, Spring 2001
- 2000  
University of California Irvine, Department of Earth System Science, Spring 2000