

Dawn Y. Sumner

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Academic Employment

2006-present Professor of Earth and Planetary Sciences, University of California, Davis
2008-present Complexity Sciences Center Faculty, University of California, Davis
2012-present Microbiology Graduate Group Faculty, University of California, Davis
2018-present Data Sciences Faculty, University of California, Davis
2014-2016 Chair of the Department of Earth and Planetary Sciences
2013-2014 Visiting Associate, California Institute of Technology (1 year)
2002-2006 Associate Professor of Geology, University of California, Davis
2004 Visiting Associate, California Institute of Technology (3 months)
1996-2002 Assistant Professor of Geology, University of California, Davis

Academic Training

1995-1996 O.K. Earl Postdoctoral Scholar in Geology, California Institute of Technology
1989-1995 Massachusetts Institute of Technology: Ph.D. 9/1995, Geology
1985-1989 California Institute of Technology: B.S. with Honor 6/1989, Geology

Research Summary

Modern Microbialite Growth: Field evaluation, experimental manipulation, and morphological, genomic and geochemical characterization of microbial communities. I study processes of self-organization and implications for interpreting ancient microbialite morphology. My research includes fieldwork in ice-covered lakes, Antarctica, focused on:

Growth processes influencing pinnacle and stromatolite formation, including the effects of mud and sand deposition, carbonate precipitation, biogeochemistry, and variations in community composition on mat morphology

Geochemical gradients created by microbial metabolism, including formation of O₂ oases, and their preservation potential

Effects of environmental change on Antarctic microbial ecosystems

Genomics of Melainabacteria and Cyanobacteria: Metagenomic characterization of a new Cyanobacterial genus, *Aurora*, and close relatives of *Cyanobacteria*, specifically *Melainabacteria* from Antarctic mats, to elucidate the evolution of oxygenic photosynthesis

Ancient Microbial Communities: Evaluation of the morphology and geochemistry of Archean to recent fossil microbial communities to constrain the evolution of microbial life and the preservation of biosignatures

Neoproterozoic Depositional Environments and Geochemistry: Characterization of Neoproterozoic ocean chemistry, elemental cycling, and microbial processes to understand microbial ecology prior to the Great Oxidation Event

Mars Sedimentology and Stratigraphy: Using rover, remote sensing images, terrestrial analog sites, and modeling to evaluate the distribution of habitable environments on early Mars. My research focuses on constraining sedimentary processes on Mars and interpreting the geological history of Gale Crater. I am a Co-I on the NASA Mars Science Laboratory (Curiosity) with the following specific responsibilities:

Long Term Planner for operations (2012-present)

Gale Mapping Working Group, chair (2012-2015)

Rock Classification Working Group, member (2014)

Landing Location Working Group, member (2012)

Gale Imaging Working Group, member (2011-2012)

Gale Ascent Team Working Group, member (2011)

Landing Site Working Group, co-chair (2010-2011)

Scientific Data Visualization: Development of techniques to create and interpret 3D data, including collaborative development of software tools through the UCD Keck Center for Active Visualization in Earth Sciences.

Honors and Awards

2018 Djerassi Resident Artists Alumni Program, week-long residency fellowship
2016 Career Award for Outstanding Contributions in Geobiosciences, Geobiology and Microbiology Division, Geological Society of America
various NASA Group Achievement Awards, for the Mars Science Laboratory Mission

	MastCamera and MAHLI Team (2013)
	Prime Mission Science and Operations Team (2015)
	Extended Mission-1 Science and Operations Team (2017)
2014	Carl Sagan Lecturer, American Geophysical Union
2014	Fellow of the Geological Society of America
2014	Djerassi Resident Artists Program and Leonardo/The International Society for the Arts, Sciences and Technology month-long residency fellowship
2014	NASA Ames Honor Award for Excellent Group/Team for the Pavilion Lake Research Project
2010	National Science Foundation Antarctica Service Medal
2003-2008	Chancellor's Fellow, University of California, Davis
1989-1992	National Science Foundation Graduate Fellowship
1991	Gretchen L. Blechschmidt Research Grant, Geological Society of America
1988-1989	Chevron Undergraduate Scholarship, California Institute of Technology
1987-1988	Carnation Scholarship Merit Award, California Institute of Technology

Professional Service: Mars Exploration and Astrobiology

National Research Council & NASA Service for the Mars Exploration Program:

- Mars 2020 Mission Standing Review Board (8/2014-present) with special focus on:
 - Surface Operability Planning
 - Landing Site Evaluation and Selection
 - Planetary Protection
- Beyond Habitability: Life and the Early Earth Workshop, invited participant (8/2014), sponsored by NASA, NSF, and the Smithsonian Institution
- Mars 2020 Mission Concept Review Board (2013)
- Planetary Science Subcommittee, Advisory Committee to NASA, member (2009-2012)
- Committee on Planetary and Lunar Exploration, National Research Council, member (2007-2008)
- Colloquium on Astrobiology and Mars Exploration, invited participant (2007)
- Reviewer for three Mars-related National Research Council reports

Mars Exploration Program Analysis Group (MEPAG) Committees:

- Mars Sample Return Desirable Analogs Working Group (2013)
- NASA Mars Science Laboratory Landing Site Science Steering Group (2005-2011)
- Next Decade Science Analysis Group (2007-2008)
- Mars Sample Return Science Steering Groups (2002, 2004-2005)
- Committee to Revise the Scientific Goals, Objectives, Investigations and Priorities document for the Mars Exploration Program (2002-2004)
- Life Detection Workshop Participant and Break-out Group Leader (2003)
- Astrobiology Science Steering Group (2002)

Community Development:

- Goldschmidt Theme Session Co-organizer "The Mineralogy of Mars" (6/2014)
- American Association of Petroleum Geologists Special Session Co-chair "Similar Processes, Different Planets: Siliciclastic Stratigraphy, Sedimentology and Diagenesis in the Search for Hydrocarbons at Gale Crater, Mars" (4/2014)
- Astrobiology Science Conference student poster judge (2006, 2010, 2012)
- First Mars Sedimentology and Stratigraphy Conference Organizing Committee (2009-2010)
- Astrobiology Science Conference 2008 Organizing Committee (2007-2008)
- NASA Astrobiology Institute Biomarkers in Archean Rocks Workshop Participant and Instructor (2007)

Professional Service: Promoting Equity in Science

- The Vortex*** – a performance project that explores exclusion and difference in STEM fields and their roles in discovery. See description below under "Arts Collaborations."
- Building a Professional Community and Anti-harassment Statements (2016-present) – Distributed to my department as Chair and Graduate Advisor, shared broadly with other department chairs: <https://dysumner.faculty.ucdavis.edu/equity/>
- Association of Polar Early Career Scientists International Polar Week webinar: "Harassment in the Field", panel member (3/23/2018; [video](#))
- 500 Women Scientists – Northern California, Noon Webinar (2018) – Presenter for "Harassment and Bias"
- Heads and Chairs of Earth and Space Science Departments, AGU Annual Meeting (2016) – Presenter for "Addressing harassment and improving workplace climate" (<http://serc.carleton.edu/departments/heads-chairs16/program.html>)
- SEA Change Workshop department chair representative for UC Davis. NSF-funded workshop sponsored by the American Association for the Advancement of Science to start a US pilot STEM Equality Achievement (SEA)

rating program for institutions of higher education using the model of the United Kingdom's Athena SWAN program. (4/6-7/2016)

Twitter (2008-present) - @Sumnerd: strong presence supporting equity and inclusion in STEM. My goals for Twitter are 1) to promote equity, particularly in STEM; 2) support others working toward similar goals; and 3) share exciting science.

Example Tweets with Impact:

Tweeted for @GeoSciTweeps the week of March 20, 2017 ([Storify summary](#))

#BlackLivesMatter (for science): <https://twitter.com/sumnerd/status/545403687829381120>

#GirlsWithToys: <https://twitter.com/sumnerd/status/599768589076303872>

The Takeaway on NPR: Audio interview on the viral Twitter #GirlsWithToys showing women doing science and engineering (5/19/2015 [audio](#); [print](#))

Sexual Harassment Statement: <https://twitter.com/sumnerd/status/707729738060537857>

Breaking Stereotypes: <https://twitter.com/sumnerd/status/753966167627223044>

Issues for Hiring Faculty of Color: <https://twitter.com/sumnerd/status/1068334512059215872>

#ActualLivingScientist: <https://twitter.com/sumnerd/status/831339680935276544>

Professional Service: Other

Reviews:

Editorial Board Member, Geobiology (2011-present)

Editorial Board Member, Astrobiology (2001-present)

Associate Editor, Palaios (1998-2004)

Reviewer for various journals, including African Journal of Earth Science, Astrobiology, Geobiology, Geochimica et Cosmochimica Acta, Geology, GSA Bulletin, Icarus, Journal of Geophysical Research, Journal of Sedimentary Research, Nature, Palaios, Precambrian Research, Science, Sedimentology, and Terra Nova.

Reviewer for various funding agencies, including NSF under both Earth and Biological sciences directorates, NASA programs representing Astrobiology and Solar System exploration, Geological Society of America, National Geographic, and the American Chemical Society Petroleum Research Fund.

NASA Astrobiology: Exobiology Proposal Review Panel (member two years; Sub-panel leader one year)

NASA Astrobiology Institute Proposal Review Panel (one year)

NASA Mars Fundamental Research Review Panel (one year)

NASA Mission and/or Mission Instrument Proposal Review Panels (2 panels)

University Service

Advisory Board Chair, Feminist Research Institute (Member: 4/1/2017-6/30/2017; Chair: 7/1/2017-present)

College of Letters and Sciences Faculty Personnel Committees for Mathematical and Physical Sciences and for Social Sciences (2018-2019, chair for MPS 2019-present)

Strength Through Equity and Diversity (STEAD) committee (2019-present)

Executive Committee, W.M. Keck Center for Active Visualization in the Earth Sciences (2004-present)

Executive Committee, Complexity Sciences Center (2008-present)

Mathematical and Physical Sciences Faculty Advisory Committee (2000-2003 member, 2017-2018 alternate, 2018-2019 member, 2019-present, alternate)

Microbiome Special Research Program, Faculty Advisory Committee (2017-present)

Soils and Biogeochemistry Graduate Group Review (Chair, 2019)

External Search Committee Member, Physics and Mathematics of the Universe multi-position hiring investment (2014-2015)

UC Davis Foundation Trustees Board Meeting, Faculty Panel Member (2013)

Ernest E. Hill Fellowship Committee (2009-2012)

E-access Faculty Hub (2009-2010)

NSF ADVANCE proposal coordinator (2009)

Arboretum Waterway Task Force (2009)

Campus Council for Information Technology (CCFIT), Steering Committee (2008-2009)

Educational Technology Subcommittee, CCFIT, Co-Chair (2008-2009)

Geology Garden Design Committee (2009)

New Building Design Focus Group and Building Committee - Geology Representative (2003-2009)

Faculty Ideas Committee for Provost Hinshaw (2006-2007)

Academic Senate Undergraduate Instruction & Program Review Committee (2004-2006; chair 2005-2006)

Academic Senate Program Review Task Force (2005-2006)

Academic Senate Undergraduate Council (2005-2006)

Academic Senate Representative Assembly (2005-2006)

Faculty FTE Advisory Group for Provost Hinshaw (2005)

Mathematical and Physical Sciences Summer Research Fellowship Selection Committee (2001-2003, chair in 2003)

Letters and Sciences Faculty Assembly, Geology Representative or Alternate (1998-2003, 2005-2009)

Academic Senate Second Alternate Geology Representative (2002-2003)
 Ad Hoc Review Panel, Consortium for Women and Research (2001)
 Ad Hoc Review Panel, Academic Senate Faculty Research Grants, one year
 Library Representative, Geology Department (1997-1998)

Department Service

Geology Graduate Program Advisor (2017-present)
 Space Committee (2002-2014; chair 2010-2013, 2017-2019)
 Faculty Search Committee Member (2017-2018)
 Chair (7/2013-11/2016; on leave July 2013 to September 2014)
 Geology Club Faculty Advisor (2001-2003, 2004-2010)
 Geology Major Undergraduate Advisor (2004-2010)
 American Association of Petroleum Geologists, Geology Department Contact (1997-2006)
 Earth and Planetary Sciences Faculty Search Committees (5) and Ad Hoc Committee to Review Bodega Marine
 Laboratory Applicants (2001-2003)

University Community Service

“Significance of Sense of Belonging in STEM Disciplines” Gendering STEM Education Lunch Panel Discussion
 sponsored by UC Davis Arab Region Consortium, Global Affairs, Empowered Arab Sisterhood, MGA Kapatid,
 and the Muslim Student Association (2/8/2019)
 “The Campus Conversation: #MeToo, Consent, and Campus Culture” Panel Discussion sponsored by UC Davis
 Humanities Institute (1/22/2019)
 Letters and Sciences Fall Welcome presentation to the Chancellor, Dean, and others (10/31/2017)
 Microbiology Graduate Group MicroBOOme presentation on Antarctic research (10/27/2017)
 Panel Member, “Feminist Research: A Conversation between Scientists and Humanists” for the Feminist Research
 Institute (5/17/2017)
 Communicating Science Through Social Media Presentation (4/22/2015)
 UCD Welcome Center Video segment (6/3/2013)
 UCD College of Letters and Sciences Dean’s Distinguished Lecture - Curiosity on Mars (5/31/2013)
 Capstone Lectures in Honor of Winston Ko - Curiosity on Mars Presentation (5/11/2013)
 UCD First Year Quarterly Seminar - Curiosity on Mars Presentation (5/9/2013)
 College of Letters and Sciences private alumni reception - Curiosity on Mars Presentation (3/16/2013)
 New student welcome video presentation from the Jet Propulsion Laboratory (9/2012)
 Donors to the Geology Department - Missions to Mars and Antarctica Presentation (2012)
 MNRC Workshop - Presentation (2011)
 UCD Young Scholars Program - Exploring Mars Presentation (2011)
 Mathematical and Physical Sciences Dean’s Advisory Committee - Presentation (2009)
 Teaching Resources Center - Presentations on YouTube and del.icio.us in teaching (3 presentations 2007-2008)
 University Writing Program - Writing samples and interview on techniques for scientific writing (2008)
 UC Davis Chancellor’s Club - Presentation (2004)
 Participation in numerous campus events and groups, including those promoting participation and retention of
 women in science and improving faculty-student interactions.

Public Outreach: Mars Science Laboratory

Public/School/Undergraduate (not at UCD) Presentations on Mars

Campus-wide presentation, astronomy/physics majors presentation, and geology majors presentation,
 Macalester College (9/19-20/2019)
 Geology of the Solar System, Dennison University, remote interview with class (5/1/2018)
 Davis Girl Scouts Career Evening Panel Member (3/19/2018)
 Sacramento Petroleum Association: Exploring Mars with Curiosity lunch seminar (2/21/2018)
 Twelve Bridges Middle School, Sacramento Area: Mars science presentation to STEM students (2/21/2018)
 Twelve Bridges Middle School, Sacramento Area: Mars science presentation to 2 classes (11/16/2016)
 Vacaville High School, Mars science presentation to 2 classes (12/7/2016)
 Davis Sunrise Rotary Club presentation, 50 community members; 20 minute presentation on “Exploring Mars
 with Curiosity” (11/6/2015)
 Dinner with a Scientist for underserved high school students, Sacramento area (11/5/2015)
 Sierra College Museum public lecture; hour-long presentation on “Exploring Mars with Curiosity” (10/16/2015
[announcement](#))
 UCD COSMOS, ~250 high school students in STEM; hour-long presentation on “Exploring Mars with
 Curiosity” (7/8/2015)
 The City School, Los Angeles: Mars Exploration Presentation to 22 6th graders (5/30/2014)

FIRST Robotics Team “Citrus Circuits Women in STEM” presentation titled “Roving Mars with Curiosity: Outstanding Women on NASA’s Mars Science Laboratory Mission” to ~50 high school students (10/25/2014)
 Mars Exploration Presentations to 1) 150 2nd and 3rd graders and 2) 175 4th and 5th graders at Emilia Earhard Grade School (5/21/2013)
 Mars Exploration Presentations to 1) the sophomore English class and 2) 75 junior and senior science students at Golden Sierra High School; dinner with science teachers (4/29/2013)
 Mars Science Laboratory Blog: <http://DawnOnMars.blogspot.com> (2012-2013)
 JPL Museum Alliance Lecture
 Martinez Rotary Club Lecture
 News Day video at Armando’s, Martinez

Media Interviews on the Mars Science Laboratory:

- 2020 Astrobiology Magazine, Starre Vartan (2/4/20)
- 2018 Science News, Joshua Sokol (11/29/18; [Article](#))
- 2017 National Public Radio, Joe Palca (6/7/18; [Article](#))
 Popular Science (6/7/18; [Article](#))
- 2015 Capitol Public Radio Insight (9/29/15 [Audio](#))
 Capitol Public Radio web article on Mars One (2/23/15; [Article](#))
 RT TV International on the color of Mars (3/2/2015)
 Sacramento Bee on Mars One (2/21/2015; [Article](#))
 “Mars Needs This Woman,” Sacramento News and Reviews feature article and cover (6/4/2015 [Article](#))
 Placer Herald on upcoming talk on Mars Curiosity rover (10/13/15 [Article](#))
 The Western Front on a recent Mars Science Laboratory publication (10/23/15 [Article](#))
- 2014 Capitol Public Radio Insight (12/17/2014 [Audio](#))
 Capitol Weekly, documentary on water in California (10/24/2014)
 “Ancient Earth, Alien Earths” panel discussion, 1 hour, NASA TV (8/20/2014 [Video](#), [News Brief](#))
 Nature News on ExoMars landing site selection (3/27/2014)
 Nature News on Mars 2020 landing site selection (various dates, spring 2014; [Article](#))
 UC Office of the President on Curiosity activities (4/25/2014; [Article](#))
 Wired Magazine on Mars habitability (2/24/2014)
- 2013 Australian Broadcasting Corporation (5/29/2013)
 Capitol Public Radio Insight (2/7/2013 [Audio](#), 6/3/2013 [Audio](#); 9/27/2013 [Audio](#))
 CBS 13 Television, Sacramento (5/30/2013)
 Davis Access Media, In the Studio (1/24/13 [Video](#))
 National Geographic and PBS documentary on maps and mapping (upcoming mini-series, filmed 8/7 & 8/14/2013)
 Universidad Internacional Menéndez Pelayo Summer School Press Briefing, Spain (6/27/2013 [Written Press Release](#))
 Voice of America’s Science World (5/30/2013 picked up globally [Blog](#))
 Astrobiology Magazine ([Article](#))
 BBC News ([Article](#))
 Nature News ([Article](#), 2nd interview)
 News at Princeton ([Article](#))
 Sacramento Bee ([Article](#))
 Science News (8/20/2013)
 US News and World Report ([Article](#))
 Astrobiology Magazine ([Article 1](#), [Article 2](#))
 Australian Broadcasting Corporation
 Discovery Channel Magazine ([Article](#))
 Martinez Gazette
 National Geographic
 Nature News ([Article](#))
 New Yorker
 Sacramento Bee ([Article](#))
 Science News
 Washington Post
- 2012 Capitol Public Radio Insight ([Audio](#))
 NASA Mars Science Laboratory Press Conference ([Video](#))
 BBC News ([Audio 1](#), [Audio 2](#))
 BBC World Service Discovery Radio Program ([Audio 1](#))
 Capitol Public Radio News Interviews ([Audio 1](#), [Audio 2](#))

- Charolotte Talks, NPR and GSA ([Video](#))
 Fox 11 Television, Los Angeles
 KCRW Radio, Which Way L.A.? ([Audio](#))
 KFBK Radio, Clear Channel ([Audio](#))
 Radio New Zealand
 University of California, Davis, News ([Video](#))
- 2011 Capitol Public Radio Insight ([Audio](#))
 NASA Mars Science Laboratory Press Conference - Landing Site Selection ([Video](#))

Public Outreach: Other

Audio and Print Media on Antarctic Research:

- Astrobiology Magazine (2015)
 Live Science (2015 [Article](#))
 Insight on Capitol Public Radio NPR (2009, 2011, 10/14/2013 [Audio](#); 10/6/2014 [Audio](#))
 Davis Enterprise newspaper interview on US government shutdown of Antarctic field season (10/11/2013)
 Take Two on KPCC NPR (10/10/2013 [Audio](#))
 Nature News interview on US government shutdown of Antarctic field season (10/8/2013)
 Radio Parallax on KDVS and KZFR (2011)
 Soundings on KMVR (2011)
 Antarctica Adventure Science Blog: <http://DawnInAntarctica.blogspot.com> (2009-2013)

Other Presentations, Discussions and Materials:

- Interview with Carolyn Gramling, Science News, on ancient stromatolites (11/14/2019; [Article](#))
 Guest lectures to microbiology, ecology, and climate science classes at Macalester College (9/20/2019)
 Sedimentology and Stratigraphy Videos on YouTube: <http://youtube.com/sumnerd> (>250,000 views, 875 subscribers; 2007-present)
 Dinner with a Scientist for underserved high school students, Sacramento area (5/2/2013, 11/5/2015)
 The Takeaway on NPR: Audio interview on the viral Twitter #GirlsWithToys showing women doing science and engineering; I received ~150k “Tweet impressions” in a week (5/19/2015 [audio](#); [print](#))
 Co-ordinated Women in Science Wikipedia Edit-a-thon at UC Davis (3/4/2014 [web page](#))
[Macroscope](#) at Maker Faire, Bay Area, Co-coordinator and booth presenter (5/18-19/2012 & 5/18-19/2013)
 Onward California Videos, University of California, Office of the President (3/2013: [Video 1](#), [Video 2](#))
 Sedimentology and Stratigraphy Blog: <http://DawnsSedStrat.blogspot.com> (2010-2013)
 UCD Picnic Day Public Lectures (1999, 2002-2007, 2009-2012, 4/20/2013)
 McMurdo Station, Antarctica, community science presentations (2009, 2010)
 3D Video Recording and Narration for the UC Davis Pavilion, California State Fair (2008)
 Modesto Area Partners in Science, Monthly Lecture (2006)
 ExplorIt Science Museum, Science Lecture and Expert Scientist for Corporate Challenge fundraiser (2004)
 Davis Rotary Club Lecture (2004)

K-12 Teacher Development

- “Let the *Curiosity Rover* Empower Your Students’ Interest in Math and Science!” Keynote presentation to Empower Students’ Curiosity in Math & Science, a STEM Educator’s Conference, sponsored by Math Educators of Solano County, UC Davis CalTeach/MAST, and California Mathematics.
- PolarTREC – Introduction to Antarctic Research webinar for teachers (3/26/2018).
- Science in the River City Guest Lecture. SIRC provides professional development for area teachers (2017).
- PolarTREC 2014 Researcher - Hosted Natomas Charter School middle school teacher Lucy Coleman for a 7 week field season in the McMurdo Dry Valleys, Antarctica. Associated activities include consultations on science aspects of curricular projects as well as numerous exchanges between the Sumner lab group and Coleman (2014-present).
- Training of high school teacher Chesshuwa Beckett in use of KeckCAVES software on a 3D TV system for teaching geological concepts (2011, 2014).
- Science in the River City Guest Lecture and Workshop on Edible Missions to Mars for teachers. SIRC provides professional development for area teachers (2009).

Arts Collaborations

- “**The Vortex**” – a performance project that explores exclusion and difference in STEM fields and their roles in discovery. It is based on the lived experience of scientists who are women, people of color, and/or gender nonconforming, conducting research within a traditionally cis white male work culture. This project is in collaboration with Prof. Meredith Tromble (San Francisco Art Institute) and choreographer Donna Sternberg.
- Chosen as a UCD SHAPE project for fall 2020. (<https://shape.ucdavis.edu/>)

- Vortex Workshop – Leonardo – The Convening. Two presentations of the concepts behind and process for developing The Vortex (11/3/2018; https://www.leonardo.info/convening_program)
- **“The Vortex”** – Performances with Donna Sternberg and Dancers, Odyssey Theater, Los Angeles (4/20-21/2018; [video](#))
- Djerassi Resident Alumni Program – Winter Residency fellowship with Tromble and Sternberg to continue development of **“The Vortex”** (1/4-11/2018)
- **“Outside the Vortex”** – Initial dance-music-projection workshop performances, Diavolo Studio, Los Angeles (6/24-25/2016)

Dream Vortex – A collaboration with Tromble and Complexity Sciences Center (UC Davis) members to interactively and immersively explore 3D networks of dreams; <http://vimeo.com/44626359>. Sumner is the main scientific contributor. (2012-present; 3/4/2013: [Art, Technology, and Culture Presentation](#), UC Berkeley; 4/25/2013: Art Practice Seminar, UC Davis; 10/2018: Gallery show, Charlottesville, VA; 11/2019 – 3/2020: Gallery show, [BioBAT Art Space](#), Brooklyn, NY; [review](#))

Alliance for the Arts in Research Universities 2015 National Meeting “Ground Works: Improving and Supporting Practice in the Third Space”. **Dream Vortex** was selected as one of 6 Transdisciplinary Exemplars for presentation, critique, and review. ([Exemplar Description](#))

Scientific Delirium Madness, Djerassi Resident Artist Program and Leonardo/The Society for the Arts, Sciences, and Technology - Fellowship to participate in the July 2014 four-week residency to continue development of the **Dream Vortex** with Tromble. ([Blog](#); [Leonardo Gallery](#))

Expressing the CAVES - An art-science collaboration focused on exploring new modes of experiencing 3D immersive environments with a focus on creative interactions among artists, scientists, and virtual objects. Sumner was Co-PI, coordinator, and participant. (2010-2012)

Presentation to TWEAK! Modding disciplines through inventive tools; a workshop at UC Davis. ([2011](#))

COLLAPSE (suddenly falling down) – Performance by the Sideshow Physical Theater with choreographer Prof. Della Davidson, Mondavi Center for Performing Arts; Sumner was facilitator and collaborator for integration of 3D visualization of earth science data in performance; <http://youtube.com/CollapseUCD> The project won the Isadora Duncan Award in Dance for Visual Design. ([2007](#))

Teaching Experience

Undergraduate:

Sediments and Strata (Winter 2000-2003, 2005-2013, 2016; Spring 2017-2020)
 Introduction to Geobiology (Fall 2017-2019)
 Understanding Climate Science Denial (Spring 2017)
 First Year Seminar – Mars Exploration (Spring 2003, 2013; Fall 2004, 2007; Winter 2011, 2013)
 The Oceans (Fall 1997, 1998, 2000, Spring 2011, 2012)
 Basin Analysis (Fall 1999, 2001, 2003, 2005; Spring 2007, 2010)
 3 Day Field Excursions (Fall 2003, Winter 2002, 2003, 2008, Spring 2002, 2007, 2009)
 Field Exercises (Spring, Summer 2008)
 Geology of Campus Waterways (Fall 2005 to Winter 2008, every quarter)
 Virtual Field Trip to Mars (Winter 2004)
 Davis Honors Challenge Seminar – Mars Exploration (Spring 2003)
 Sedimentary Petrography (Fall 1997)

Graduate:

Understanding Climate Science Denial (Spring 2017, 2018)
 Geobiology (Fall 2017; Winter 1997, 2015; Spring 2001, 2003, 2012)
 Sedimentology and Stratigraphy of Mars (Spring 2013, 2018)
 Sequence Stratigraphy (Fall 2008, Winter 2011)
 Sequence Stratigraphy of Tectonically Active Basins (Winter 2019)
 Carbonate Platforms Through Time (Winter 2005)
 3D Imaging and Computed Tomography (Fall 2004)
 6 Day Field Excursion (Spring 2002)
 Advanced Field Stratigraphy (Spring 1998, 1999, 2000, Winter 2019)
 Carbonate Geochemistry and Precipitation Kinetics (Winter 1999)
 Neoproterozoic Environmental Change (Winter 1998)
 Geochemistry (Spring 1997)

Undergraduate Theses Supervised

Hoffman-Davies, Emma, 2019. Causes for the Formation of Ordovician Thrombolites in the Hueco Mountains, Texas, USA

Sramek, Natasha, 2018. Quantifying pinnacle morphology using 3-dimensional reconstructions of microbial mats in Lake Vanda, Antarctica.

- Liedman, Sasha, 2014. GIS Analysis of the Water Balance of Lake Vanda, Antarctica. Currently a graduate student at Rutgers University.
- Juarez Rivera, Marisol, 2013. Unraveling the three dimensional morphology of Archean microbialites. Completed a M.S. at UC Davis. Currently a graduate student at Arizona State University.
- Dolezal, Lauren, 2009. 2D and 3D Analysis of Thrombolites: Stromatolite Diagenesis or Originally Clotted Texture.
- Stevens, Eric, 2009. Microbialites in 2D and 3D. Completed a M.S. at University of Minnesota.
- Stork, Natalie, 2008. CaCO₃ Precipitation in Freshwater Biofilms Dominated by *Oscillatoria* sp. Completed a M.S. at University of Connecticut. Currently working in the environmental consulting industry.
- Senge, Patrick, B. S. 2006. Development of the Late Archean Microbialite Support and Drape Structures of the Gamohaana Formation, Transvaal Supergroup, South Africa. Currently working in the mining industry.
- Chavdarian, Gregory V., B.S. 2005. Cracks and Razorbacks: Pieces of Mars at White Sands National Monument, New Mexico. Completed a M.S. in Geology with Sumner in 2008. Currently working as an environmental tour guide.
- Alexander, Kathryn, B.S. 2005. "MISS" in a Laboratory Setting: Observations and Mechanisms of Formation. Completed a M.S. in Geobiology at Arizona State University.
- Huerta, Nicolas, B.S. 2003. Neutron Computed Tomography: A Characterization of the System at McClellan Nuclear Radiation Center and Presentation of Groundwork Research for Use by Sedimentary Geologists. Completed a M.S. in Geology with Sumner in 2007, a M.S.E. in petroleum engineering and Ph.D. in geology at the University of Texas, Austin, and is now working as a geologist at the DOE National Energy Technology Laboratory.
- Lee, Gina, B.S. 2003. Thirty-nine Years of Cache Creek Migration and Embankment Erosion. Completed a M.S. at San Francisco State University after working as an environmental consultant.
- Snyder, Jason, B.S. 2002. Isotope Geochemistry of Egyptian Cave Deposits. Completed a M.S. in Atmospheric Sciences and a Ph.D. in Geography at UC Davis.
- Fenger, Tracy L., B.S. 2000. Glacial Interpretation for the Rainstorm Member of the Johnnie Formation, Eastern California. Completed a M.S. in Paleoclimatology at University of North Carolina, Chapel Hill, after working as an environmental consultant.

Graduate Theses Supervised

- Wall, Kate, Ph.D., 2018. Microbes of the Pinnacled Mats of Lake Vanda, Antarctica.
- Almatar, Mohammed R., M.S., 2018. Origin of Thrombolite Fabrics: Documentation of Cambrian Metazoans Influence on Great Basin Carbonates, California and Nevada. Currently working for Saudi-ARAMCO.
- Dillon, Megan, Ph.D., 2018. The Phylogenetic and Metabolic Structure of the Benthic Microbial Mats in Lake Fryxell, Antarctica: Effects of Photosynthetically Active Radiation and Oxygen Concentration. Currently a postdoctoral scholar at Lawrence Berkeley National Labs.
- Rivera-Hernandez, Frances, Ph.D. 2018. Establishing Diagnostic Criteria for Identifying Ancient Perennially Ice-Covered Lakes in the Sedimentary Record of Earth and Mars. Currently a post doctoral scholar at Dartmouth.
- Mackey, Tyler, Ph.D. 2016. Sand, Mud, and Calcite: Microbial Landscapes on Antarctic Lake Beds. Currently a postdoctoral scholar at MIT; Agouron Geobiology Fellowship recipient.
- Juarez Rivera, Marisol, M.S. 2016. Recreating Microbial Ecosystems at the Dawn of the Great Oxidation Event. Currently a Ph.D. student at ASU.
- Williams, Amy, Ph.D. 2014. Microbial Biosignature Preservation at Iron Mountain, California. Currently an Assistant Professor at University of Florida.
- Harwood, Cara, Ph.D. 2013. Microbial and Metazoan Influences on Microbialite Growth Structures: Insights from Recent Lacustrine Microbialites in Pavilion Lake, BC, and Cambrian Thrombolites from the Great Basin, CA and NV. Currently working as Director of Professional Development in Teaching and Learning at WISCIENCE, University of Wisconsin-Madison.
- Mackey, Tyler, M.S. 2012. Initiation of branched growth in coniform stromatolites as a response to microbial community and water depth changes in Lake Joyce, Antarctica. Currently a post doctoral scholar at MIT; Agouron Geobiology Fellowship recipient.
- Harwood (Theisen), Cara, M.S. 2009. Multiple Origins of Diverse Microbial Fabrics in Co-occurring Thrombolitic and Stromatolitic Structures from the Neoproterozoic Beck Spring Dolomite. Currently working as Director of Professional Development in Teaching and Learning at WISCIENCE, University of Wisconsin-Madison.
- Shepard, Rebekah N., Ph.D. 2009. The Significance of Cell Motility to Microbial Community Morphogenesis.
- Bishop, James, Ph.D. 2008. Sedimentation and Diagenesis During the Late Paleozoic Ice Age: Arrow Canyon, Nevada, and the Capitan Backreef, Slaughter Canyon, New Mexico. Currently working as a geologist at Chevron.
- Chavdarian, Gregory V., M.S. 2008. Polygonal Cracks and Mineral-Atmospheric Water Cycling in Hydrous Sulfate Sands: An Analog to Martian Outcrops. Worked in the petroleum industry for several years. Currently working as an environmental tour guide.
- Huerta, Nicolas, M.S. 2007. Neutron Computed Tomography and Porosity in Geologically Relevant Samples. Completed a M.S.E. in petroleum engineering and Ph.D. in geology at the University of Texas, Austin, and is now working as a geologist at the DOE National Energy Technology Laboratory.
- Murphy, Megan, Ph.D. 2006. Variations in Microbialite Morphology with Depositional Environment in a

- Precambrian Ramp Deposit, Hamersley Group, Western Australia. Worked as a geologist at Chevron for several years.
- Bishop, James, M.S. 2004. A New Model for Molar Tooth Structure, Facies, and Stratigraphy of the Neoproterozoic Monteville Formation, Transvaal Supergroup, South Africa. Currently working as a geologist at Chevron.
- Tabor, Maris, M.S. 2004. Applications of Neutron Computed Tomography for 3-D Imaging of Microbial Structures in Archean Carbonates.
- Perkins, Katherine, M.S. 2003. Sequence Stratigraphy of a Portion of the Lower Cambrian Grand Cycle C, Southwestern Nevada and Southeastern California. Currently working as an academic advisor at a community college.
- Stephens, Nat P., Ph.D. 2002. Late Devonian Stratigraphy, Stable Isotopic Analyses, and Paleoecology in the Napier, Oscar, and Emanuel Ranges, Canning Basin, Western Australia. Currently working as a Senior Geologist at ExxonMobil Exploration Company.
- Tourre, Sarah A., M.S. 2000. Cave-Filling Herringbone Calcite: Morphology and Geochemistry of an Unusual Carbonate Cement from Egypt. Currently working in environmental consulting.

Post Doctoral Researchers Supervised

- Grettenberger, Christen. Genomic studies of Antarctic microbial mats, including Melainabacteria. (12/2015-present)
- Nachon, Marion. Characterization of diagenetic and facies relationships from Mars Science Laboratory data. (3/2016-7/2018). Currently a post doctoral scholar at UT Austin.
- Shepard, Rebekah. Studies of microbialites in a temperate lake, BC, and in a perennially ice-covered lake, Antarctica. (2009)
- Shiraki, Ryoji. Experimental precipitation of calcite in the presence of reduced iron.

Publications

(*student advisee)

In Review:

- Nayfach, Stephen, Simon Roux, Rekha Seshadri, Daniel Udvary, Neha Varghese, Frederik Schulz, Dongying Wu, David Paez-Espino, I-Min Chen, Marcel Huntemann, Krishna Palaniappan, Joshua Ladau, Supratim Mukherjee, T.B.K. Reddy, Torben Nielsen, Edward Kirton, José P. Faria, Janaka N. Edirisinghe, Christopher S. Henry, Sean P. Jungbluth, Dylan Chivian, Paramvir Dehal, Elisha M. Wood-Charlson, Adam P. Arkin, Susannah Tringe, Axel Visel, **IMG/M Data Consortium**[^], Tanja Woyke, Nigel J. Mouncey, Natalia N. Ivanova, Nikos C. Kyrpides, Emiley A. Elze-Fadrosch, in review. A genomic catalogue of Earth's microbiomes. Nature Biotechnology [^]Sumner contributed metagenomic data to this publication.

Accepted and In Press:

- Dillon*, Megan L., Ian Hawes, Anne D. Jungblut, Tyler J. Mackey*, Jonathan A. Eisen, Peter T. Doran, and Dawn Y. **Sumner**, in review. Environmental control on the distribution of metabolic strategies of benthic microbial mats in Lake Fryxell, Antarctica. PLOS ONE
- Grettenberger, Christen L., Dawn Y. **Sumner**, Kate Wall*, C. Titus Brown, Jonathan Eisen, Tyler J. Mackey, Ian Hawes, and Anne Jungblut, in review. Insights into the evolution of oxygenic photosynthesis from a phylogenetically novel, low-light cyanobacterium. ISME Journal. (preprint: <https://doi.org/10.1101/334458>)

Peer Reviewed Publications:

2020

- Dillon* Megan L., Ian Hawes, Anne D. Jungblut, Tyler J. Mackey*, Jonathan A. Eisen, Peter T. Doran, and Dawn Y. **Sumner**, 2020. Energetic and environmental constraints on the community structure of benthic microbial mats in Lake Fryxell, Antarctica. FEMS Microbiology Ecology. DOI: [10.1093/femsec/fiz207](https://doi.org/10.1093/femsec/fiz207)
- Rivera-Hernandez*, Frances, Dawn Y. **Sumner**, Nicolas Mangold, Steven G. Banham, Kenneth S. Edgett, Christopher Fedo, Sanjeev Gupta Samantha Gwizd, Ezat Heydari, Sylvestre Maurice, Marion Nachon, Horton Newsom, Juergen Schieber, Katie Stack-Morgan, Nathan Stein, and Roger Wiens, 2020. Grain size variations in the Murray formation: Stratigraphic evidence for changing depositional environments in Gale Crater, Mars, Journal of Geophysical Research – Planets. DOI: [10.1029/2019JE006230](https://doi.org/10.1029/2019JE006230)
- Szopa, Cyril, Caroline Freissinet, Daniel P. Glavin, Maeva Millan, Arnaud Buch, Heather B. Franz, Roger E. Summons, Dawn Y. Sumner, Brad Sutter, Jennifer L. Eigenbrode, Ross H. Williams, Rafael Navarro-González, Melissa Guzman, Charles Malespin, Samuel Teinturier, Paul R. Mahaffy, and Michel Cabane, 2020. First detections of dichlorobenzene isomers and trichloromethylpropane from organic matter indigenous to Mars mudstone in Gale Crater, Mars: Results from the Sample Analysis at Mars instrument onboard the Curiosity Rover. Astrobiology. DOI: <https://www.liebertpub.com/doi/abs/10.1089/ast.2018.1908>

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- Matys, Emily D., Tyler Mackey, Christen Grettenberger, Dawn Y. **Sumner**, Ian Hawes, Elliott Mueller, and Roger E. Summons, 2019. Bacterioplanepolyols across environmental gradients in Lake Vanda, Antarctica. *Geobiology*. DOI: [10.1111/gbi.12335](https://doi.org/10.1111/gbi.12335)
- Matys, Emily D., Tyler Mackey, Christen Grettenberger, Elliott Mueller, Anne Jungblut, Dawn Y. **Sumner**, Ian Hawes, and Roger E. Summons, 2019. Environmental controls on bacterioplanepolyol profiles of benthic microbial mats from Lake Fryxell, Antarctica. *Geobiology*. DOI: [10.1111/gbi.12353](https://doi.org/10.1111/gbi.12353)
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