

Kennda L. Lynch

E-mail: klynch31@gatech.edu

Phone: 281.813.1385

<http://kenndalynch.com>

EDUCATION

PhD, Colorado School of Mines, 2015, Environmental Science & Engineering

Dissertation Title: A geobiological investigation of the hypersaline sediments of Pilot Valley, Utah: A potential terrestrial analogue to ancient lake basins on Mars

Advisors: Dr. Junko Munakata Marr & Dr. John Spear

M.S. University of Colorado at Boulder, 2008, Aerospace Engineering Sciences

Advisor: Dr. David Klaus

Dual B.S. University of Illinois, 1999, General Engineering and Biology

Engineering Concentration: Space Life Sciences & Advanced Life Support

AREAS OF PROFESSIONAL EXPERTISE AND INTEREST

- Astrobiology, planetary habitability, and Mars analog research
- Geomicrobiology of hypersaline sediments
- Microbial ecology and bioenergetics of extreme environments
- Environmental biotechnology & bio-resource engineering
- Development of *in situ* instrumentation for robotic exploration
- Teaching, mentoring, and STEM curriculum development (both collegiate and K-12)
- Science communication

PROFESSIONAL EXPERIENCE

Georgia Institute of Technology, Atlanta, GA Oct 2016 - Present

Postdoctoral Research Fellow, Rosenzweig Group

University of Montana, Missoula, MT

Postdoctoral Research Fellow, Rosenzweig Group Feb 2016- Oct 2016

Jacobs Sverdrup/ Lockheed Martin Space Operations, Houston, TX

Senior Research Engineer, JSC Astrobiology Group, ARES 2003-2006

Project Engineer, International Space Station Program 2001-2003

Abbott Laboratories, Engineering Professional Development Program, North Chicago, IL

Metrology Engineer, Corporate Engineering Division 2000-2001

The Boeing Company, International Space Station Program, Houston, TX

Cooperative Education Student, Hardware/Software Integration 1997-1999

Honeywell, Micro Switch Division, Freeport, IL

Intern through University of Illinois Imprint Program 1993

RESEARCH EXPERIENCE**Colorado School of Mines, Golden, CO**

Research Scholar, Geo & Environmental Microbiology Lab	2008-2015
--	-----------

University of Colorado, Boulder, CO

LASP Research Assistant w/Brian Hynek	Spring 2008
---------------------------------------	-------------

BioServe Space Technologies Research Assistant w/Alex Hoehn	2006-2008
---	-----------

University of Illinois, Urbana-Champaign, IL

Team Leader: Undergraduate Microgravity Research Team	1998-1999
---	-----------

NASA Kennedy Space Center, Cape Canaveral, FL

Space Life Science Training Program Participant	Summer 1995
---	-------------

Virginia Institute of Marine Science, Gloucester Point, VA

Howard Hughes REU Research Assistant w/ Mark R. Patterson	Summer 1994
---	-------------

TEACHING AND MENTORING EXPERIENCE**Georgia Institute of Technology, Atlanta, GA**

Embedded Scientist, First Year Composition Course	Fall 2017
---	-----------

Co-Mentor, GaTech Undergrad Lauren Kimbrough	2017-present
--	--------------

Co-Mentor, GaTech Summer REU student Tyia Pratt	Summer 2017
---	-------------

Colorado School of Mines, Golden, CO

Mentor, SAGANet Virtual Mentoring Program	2013-present
---	--------------

Mentor, CSM undergrads Chris Matthews & Nohemi Almaraz	2013-2014
--	-----------

Teaching Fellow for Bechtel K-5 Educational Initiative	2011-2013
--	-----------

Laboratory Instructor for BELS 311 (Gen. Bio. Laboratory 1)	2010-2011
---	-----------

University of Colorado, Boulder, CO

Graduate Mentor for SMART Summer Program	2007-2008
--	-----------

Teaching Assistant for ASTR/GEOL 3300 (Extraterrestrial Life)	Fall 2007
---	-----------

Co-Faculty Mentor for ASEN 4018/4028 Senior Project Design	2006-2007
--	-----------

NASA Johnson Space Center, Houston, TX

Mentor, JSC Co-ops: Madhurita Sengupta & Laura Sarmiento	2005
--	------

Mentor, HS Student Jennifer Hsu, NASA SHARP Program	Summer 2004
---	-------------

University of Illinois, College of Engineering, Urbana-Champaign, IL

Engineering 100 Program Director	1997-1999
----------------------------------	-----------

Engineering 100 Learning Assistant	1996
------------------------------------	------

Teaching Assistant for GE 221 (Intro. to Engineering Design)	Fall 1998
--	-----------

Teaching Assistant for GE 199 (Intro. to General Engineering)	1996-1997
---	-----------

REFEREED JOURNAL AND CONFERENCE PUBLICATIONS

1. **K. L. Lynch**, K. Rey, R. J. Bond, J. F. Biddle, J. R. Spear, and J. Munakata-Marr. Discrete community assembly within hypersaline paleolake sediments along a geochemical transect in the Great Salt Lake desert, Utah. (*In Preparation*)
2. **K. L. Lynch**, W. A. Jackson, J. R. Spear, R. F. Rosenzweig, J. Munakata-Marr. Evidence for biotic perchlorate reduction in naturally perchlorate-rich sediments of Pilot Valley Basin, Utah. (*Accepted October 2018; In Press - Astrobiology*)
3. Hays, L. E., H. V. Graham, D. J. Des Marais, E. M. Hausrath, B. Horgan, T. M. McCollom, M. N. Parenteau, S. L. Potter-McIntyre, A. J. Williams and **K. L. Lynch** (2017). Biosignature

Preservation and Detection in Mars Analog Environments. *Astrobiology*, 17(4): 363-400. (**10th most downloaded paper from Astrobiology in 2017**)

4. Domagal-Goldman SD, Wright KE, Adamala K, Arina de la Rubia L, Bond J, Dartnell LR, Goldman AD, **Lynch KL**, Naud M-E, Paulino-Lima IG and others. (2016) The Astrobiology Primer v2.0. *Astrobiology*, 16: 561-653.
5. **K. L. Lynch**, B. H. Horgan, J. Munakata-Marr, J. Hanley, R. J. Schneider, K. A. Rey, J. R. Spear, W.A. Jackson and S. M. Ritter (2015). Near-infrared spectroscopy of lacustrine sediments in the Great Salt Lake Desert: An analog study for Martian paleolake basins. *Journal of Geophysical Research: Planets* 120(3): 599-623.
6. B. A. Jones, M. F. Vogt, M. Chaffin, M. Choukroun, N. Ehsan, L. J. Gibbons, **K. L. Lynch**, K. N. Singer, D. G. Blackburn, G. A. DiBraccio, D. Gleeson, A. LeGall, T. McEnulty, E. Rampe, C. Schrader, L. Seward, I.B. Smith, C. C. C. Tsang, P. Williamson, J. Castillo, C. Budney. Concept for a New Frontiers Mission to Ganymede: A Planetary Science Summer School Study. *IEEE Aerospace Systems Conference*. March 5th-12th, 2011. Big Sky, Montana. Paper #1783

For a to-date status on publications, please see <http://KenndaLynch.com>

SELECTED CONFERENCE PAPERS AND PRESENTATIONS (of 29 total)

1. **K. L. Lynch**, J. J. Wray, K. A. Rey, and R. J. Bond. "Habitability and Preservation Potential of the Bottomset Deposits in Jezero Crater." *Fourth landing site workshop for the Mars 2020 rover mission*, October 16-19, 2018. Glendale, CA.
2. **K. L. Lynch**, W. A. Jackson, J. R. Spear, R. F. Rosenzweig, and J. Munakata Marr. "Investigating the Coexistence of Perchlorate Reducing Bacteria and Naturally Occurring Perchlorate-Rich Sediments in the Pilot Valley Paleolake Basin." *Astrobiology Science Conference (AbSciCon)*. April 24-28th, 2017. Mesa, AZ.
3. **K. L. Lynch** and J.J. Wray. "Exploring Habitability, Hydrology, and Climate Change on Mars at Columbus Crater." *First Landing Site/Exploration Zone Workshop for Human Missions to the Surface of Mars*, October 27-30, 2015. Houston, Texas. LPI Contribution No. 1879, p.1041.
4. **K. L. Lynch**, B. H. Horgan, J. Munakata-Marr, J. Hanley, R. J. Schneider, K. A. Rey, J. R. Spear, W.A. Jackson and S. M. Ritter. "Microbial Ecology of Hypersaline Paleolake Sediments Along a Geological Transect in the Great Salt Lake Desert, Utah: A Habitability Model for Early Mars." *Astrobiology Science Conference (AbSciCon)*. June 15-19th, 2015. Chicago, IL.
5. **K. L. Lynch**. "Investigating the Habitability of Paleolake Basins on Earth and Mars." *Society for Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS) Annual Conference*. October 16-18th, 2014. Los Angeles, CA. (Invited)
6. **K. L. Lynch**, B. H. Horgan, J. Hanley, K. A. Rey, R. J. Schneider, W.A. Jackson, Scott Ritter, J. R. Spear, J. Munakata Marr. "Near-Infrared Spectroscopy of sediments in the Great Salt Lake Desert, Utah: Analogs for Lacustrine Environments on Early Mars." *Society for Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS) Annual Conference*. October 16-18th, 2014. Los Angeles, CA.
7. **K. L. Lynch**, K. M. McGuire, S.M. Ritter, R.J. Schneider, J. Munakata Marr. The Great Salt Lake Desert: Exploring the Habitability of Paleolakes on Earth and Mars. *Third Conference on Early Mars: Geologic, Hydrologic, and Climatic Evolution and the Implications for Life*. #1680. May 21st -25th, 2012. Lake Tahoe, Nevada. (poster)
8. **K. L. Lynch**. Development of Automated Sample Extraction and Preparation System for Astrobiology in situ Research Applications. *62nd International Astronautical Congress. Space*

Life Sciences Symposium, Session: Astrobiology & Exploration. Paper #IAC-11-A1.5.8. October 3-7th, 2011. Cape Town, South Africa.

9. **K. Lynch**, C. Galindo, D. Garrison. Automated Sample Preparation for Life Detection Technologies. *Astrobiology Graduate Student Conference*. April 13-14th, 2008. Santa Clara, CA.

For a complete list, please see <http://KenndaLynch.com>

TRAVEL GRANTS, SCHOLARSHIPS, and FELLOWSHIPS

Ford Foundation Postdoctoral Fellowship	2018
Mars Student Travel Award (\$1K), NASA Mars Program Office	2006, 2009, 2012, 2015
"On To the Future" Meeting Registration Grant, GSA (\$115)	2013
Career Development Award (\$1K), Lunar & Planetary Institute	2013
Carl Storm Minority Fellowship (\$600), Gordon Conferences	2013
Bechtel K-5 Educational Initiative Fellowship (\$60K)	2011-2013
Edna Bailey Sussman Foundation Summer Internship Award (\$3K)	2009
NASA Harriet Jenkins Predoctoral Fellowship (\$90K)	2008-2011
AGEP Fellowship, Colorado Diversity Initiative (\$25K)	2006
NAI Travel Award (\$2K), NASA Astrobiology Institute	2004, 2010, 2011
The Boeing Company Scholarship (\$3K)	1999
Department of General Engineering Alumni Award (\$1K)	1997, 1998
University of Illinois President's Scholarship (full tuition & fees)	1993-1998

RESEARCH GRANTS (PAST, CURRENT, AND PENDING)

Status: Present
 Project: Investigating the Metabolic and Environmental Flexibility of Biological Perchlorate Reduction in a Mars analog environment.
 Source: Ford Foundation Fellowship Program, run by the National Academies – <http://nationalacademies.org/ford>
 PI: Dr. Kennda Lynch (Research Co-Mentors: Dr. Jennifer Glass and Dr. Frank Rosenzweig)
 Award: \$45,000
 Period: 06/01/2018 - 06/01/2019
 Person-Months/yr: 12 (calendar)

Status: Past
 Project: Investigating the Geobiology of Pilot Valley Basin, Utah: A Mars Analog Study of a Groundwater-dominated Paleolake Basin
 Source: NASA Astrobiology Institute, Center Director's Discretionary Fund (PI)
 PI: Dr. Kennda Lynch, Georgia Institute of Technology & Georgia Tech NAI Lead Team: Rediscovering the Past.
 Award: \$51,685
 Period: 2/1/2016 - 10/1/2016 (Extension & Additional funding granted through 05/28/2018)
 Person-Months/yr: 8.0 (calendar)

Status: Past
 Project: Perchlorate, Water, and Life: the geomicrobiology of Mars analog soils

Source: NASA Astrobiology Institute, Center Director's Discretionary Fund (Co-I)
 PI: Dr. Mark Claire, University of Washington
 Award: \$62,879
 Period: 11/23/2010 - 05/31/2012
 Person-Months/yr: 2.0 (calendar)

Status: Past

Project: Unambiguous Detection of Extraterrestrial Microbial Metabolic Activity Using Differential Electrochemical Detection

Source: NASA Astrobiology Science and Technology Instrument Development (Grad Student)
 PI: Dr. Samuel Kounaves, Tufts University
 Award: \$1,213,843
 Period: 10/01/2005 - 09/30/2008
 Person-Months/yr: 6.0 (calendar; year 2 & 3 only)

HONORS

Featured in Episode 9 of Netflix Series "Explained"	2018
Alumni Profile, Industrial and Enterprise Systems Engineering, UIUC	2017
Student Journal Paper Award, 2nd Place, Colorado School of Mines	2015
Outstanding Graduate Presentation, SACNAS National Conference	2014
FameLab USA, Season 2 - Wild Card	2013
Ford Foundation Dissertation Fellowship - Honorable Mention	2013
MS PHD's (http://www.msphds.org/) - Cohort IX Fellow	2012
NASA Student Ambassador - Cohort II	2010
Apex Award of Excellence - NSBE Magazine: Contributing Writer	2007
Profiled in <u>Women in Aerospace: Cool Careers on the Final Frontier</u>	2003
NASA Special Scientific Achievement Awards – (5 total awards)	2003
Knight of St. Patrick, University of Illinois (Engineering Highest Honor)	1999
Boeing Quality Pride Award for Outstanding Performance	1998, 1999
NSBE Technical Paper Contest, 1st Place Winner	1996

FIELD EXPERIENCE

Great Salt Lake Desert Mars Analog Field Project, Utah, USA	2010-Present
Mars Analog Research & Technology Experiment, Rio Tinto, Spain	2003-2005
Cashes Ledge Ecosystem Project, Gulf of Maine	Summer 1994, Summer 1995

CAREER DEVELOPMENT & TRAINING

EU-US Marine Bioinformatics Course	2013
NASA-JPL Planetary Science Summer School	2010
University of Denver Summer Institute	2009
NASA-Nordic Astrobiology Winter School	2005
NASA Astrobiology Institute Geology Insight Course	2003

PROFESSIONAL SERVICE

Advisor to the Organizing Committee, AbGradCon, Georgia Tech	June 2018
Organizing Committee, Astrobiology Colloquium, Georgia Tech	March 2018
Organizing Committee, Symposium on Space Innovations	October 2017
Session Chair, 4th International Conference on Early Mars	October 2017
Session Chair, Life in the Cosmos Symposium, Georgia Tech	September 2017
Session Convener, Astrobiology Science Conference	2015
ISE Alumni Board Member, University of Illinois	2012 - Present
New Perspectives Panel Member, Third Conference on Early Mars	2012
Organizing Committee, Astrobiology Graduate Conference	2011
Co-Coordinator, Astrobiology Research Focus Group (RFG)	2011
Mars Panel Rapporteur, NRC Planetary Science Decadal Survey	2010
President's Committee on Diversity, Colorado School of Mines	2008-2013
Proceedings Editor, NASA Next Generation Exploration Conference	2006

REFeree SERVICES**Journals**

JGR Planets - Manuscript Reviewer
 Geobiology - Manuscript Reviewer
 Astrobiology - Manuscript Reviewer
 Planetary and Space Science – Manuscript Reviewer

Grants Proposals

NASA Exobiology Program Peer Review Panel
 NASA Earth and Space Science Fellowship (NESSF) Review Panel

INVITED TALKS

Dept. Biological Sciences, University of Alberta	August 2018
Planetary Science Seminar, Georgia Institute of Technology	January 2017
Helena Engineers Club, Helena MT	November 2015
SACNAS Annual Conference, Los Angeles, CA	October 2015
Earth Science Seminar, Montana State University	February 2014
Astrobiology Coffee Hour, Arizona State University	January 2013
ISE Engineer in Residence, University of Illinois	October 2011, October 2013
Dr. John Coates Research Group, University of California-Berkeley	October 2008

EDUCATIONAL PUBLICATIONS

K. Lynch "WALL•E: Saving the Earth, Forecasting the Future" (Feature Story). NSBE Bridge Magazine. Summer 2008 Issue

K. Lynch "Learning Life on Mars". Magazine of the National Society of Black Engineers (NSBE). March/April, 2007. Vol. 18. #4:57-59.

PROFESSIONAL REFERENCES

Dr. Frank Rosenzweig (*Postdoctoral Co-Mentor*)

Professor

School of Biological Sciences, Georgia Institute of Technology

Email: frank.rosenzweig@biology.gatech.edu

Phone: 404.385.4458

Dr. James Wray (*Postdoctoral Co-Mentor*)

Associate Professor

School of Earth and Atmospheric Sciences, Georgia Institute of Technology

Email: jwray@gatech.edu

Phone: 404.894.1992

Dr. Jennifer Glass (*Postdoctoral Co-Mentor*)

Assistant Professor

School of Earth and Atmospheric Sciences, Georgia Institute of Technology

Email: jennifer.glass@eas.gatech.edu

Phone: 404.894.3942

Dr. Junko Munakata Marr (*PhD Advisor*)

Associate Professor

Civil & Environmental Engineering, Colorado School of Mines

Email: jmmarr@mines.edu

Phone: 303.273.3421

Dr. Briony Horgan (*Collaborator*)

Assistant Professor

Earth, Atmospheric, and Planetary Sciences, Purdue University

Email: briony@purdue.edu

Phone: 503.703.8473

Dr. Sam Kounaves (*Collaborator & Mentor*)

Professor

Department of Chemistry, Tufts University

Email: samuel.kounaves@tufts.edu

Phone: 617.627.3124

Kennda L. Lynch
Dr. Robin Bond (*Collaborator*)
Assistant Professor
Department of Chemistry, The Evergreen State College
Email: bondr@evergreen.edu
Phone: 720.369.4955

Curriculum Vitae