

# Lynn Justine Rothschild

Mail Stop 239-20 • NASA Ames Research Center • Moffett Field, CA 94035-1000  
mobile: (650) 283-3301

e-mail: [Lynn.J.Rothschild@nasa.gov](mailto:Lynn.J.Rothschild@nasa.gov); [lynnjrothschild@gmail.com](mailto:lynnjrothschild@gmail.com);  
<http://research.brown.edu/research/profile.php?id=1238526666>

ORCID number : 0000-0003-2970-8048

## education

- 1987-90 National Research Council Postdoctoral Fellow, NASA Ames Research Center
- 1985-87 Postdoctoral Fellow, Brown University
- 1985 Ph.D., Molecular and Cell Biology, Brown University  
Ph.D. Thesis title: Assessment of evolutionary relationships among protistan phyla and a blue-green prokaryote by comparison of the enzyme ribulose-1,5-bisphosphate carboxylase.
- 1981 M.A., Zoology, Indiana University, Bloomington
- 1979 Visiting Graduate Student, Department of Zoology, University of Maryland, College Park
- 1978 B.S., Biology, Yale University

## professional experience

- 2025 Adjunct Professor, Department of Earth and Planetary Sciences, Stanford University
- 2016-20 Bio and Bio-Inspired Technologies, Research and Technology Lead for NASA HQ STMD
- 2015-present Senior Scientist, Planetary Systems Branch, NASA Ames Research Center
- 2012-8 Adjunct Professor, Department of Microbiology and Toxicology, UC, Santa Cruz
- 2012-5 Senior Scientist, Biospheric Science Branch, Earth Science Division, NASA Ames
- 2011-9 Faculty Advisor, Stanford-Brown iGEM team (awards listed below)
- 2010-11; 13-5 Lead Scientist, Synthetic Biology Program, NASA Ames Research Center
- 2008-present Adjunct Professor, Molecular Biology, Cell Biology and Biochemistry, Brown University
- 2007-13 Consulting Professor, Program in Human Biology, Stanford University
- 2005-7 Director, Astrobiology Strategic Analysis and Support Office
- 2003-2007 Consulting Associate Professor, Program in Human Biology, Stanford University
- 1997-present Research Scientist, NASA Ames Research Center
- 1990-97 Research Scientist, Johnson Controls World Services
- 1977 Research Associate, Department of Zoology, University of Cambridge

## honors

- 2026 Inaugural Aurelia Institute Prize in Design for Space Urbanism, runnerup of >200 entries
- 2026 Yale University Gruber Lecture (April 2026)
- 2024 Member, EBRC (Engineering Biology Research Consortium)
- 2024 NIAC (NASA Innovative Advanced Concepts) Fellow, NASA
- 2021 Presidential lecture, Psychological Society of America
- 2020 NASA Group Achievement Award, PowerCell on EuCROPIS
- 2020 NASA Ames Group Achievement Award, PowerCell on EuCROPIS
- 2020 NIAC (NASA Innovative Advanced Concepts) Fellow, NASA
- 2019 NASA Ames Director's Award for EuCROPIS mission
- 2019 TEDx talk posted on TED global  
[https://www.ted.com/talks/lynn\\_rothschild\\_the\\_living\\_tech\\_we\\_need\\_to\\_support\\_human\\_life\\_on\\_other\\_planets?language=en](https://www.ted.com/talks/lynn_rothschild_the_living_tech_we_need_to_support_human_life_on_other_planets?language=en) (388 k views as of 4.26.2022)
- 2018 NIAC (NASA Innovative Advanced Concepts) Fellow, NASA
- 2018 VanZant Endowed Lectureship sponsored by Rice Bioscience Graduate students (March)

2016 2016 Gagliardi Family Distinguished Lecture, Roger Williams University, Bristol, RI (25 Oct)  
 2016 2016 Colston Symposium Public Lecture, Bristol, UK (7 September)  
 2016 NIAC (NASA Innovative Advanced Concepts) Fellow, NASA  
 2016 Vice-Chancellor Award Public Lecture, University of Southern Queensland, Australia (19 July)  
 2015 Horace Mann Medal, Brown University Graduate School (awarded at May graduation)  
 2015 American Humanist Association's Isaac Asimov award (awarded at Annual Meeting. citation: <http://conference.americanhumanist.org/awardees2015/> acceptance speech: <https://www.youtube.com/watch?v=nlCK7HO2Cyg>)  
 2014 TEDx talk, March 9, Life as we (now) know (<https://www.youtube.com/watch?v=nlCK7HO2Cyg>)  
 2013 NIAC (NASA Innovative Advanced Concepts) Fellow, NASA  
 2013 Lecture, Royal Swedish Academy of Sciences-Molecular Frontiers, May  
 2012 CEO Award, Gen9 G-Prize  
 2010 Distinguished Planetary Science Lecture, University of Western Ontario (Canada)  
 2009 Tim Mutch Memorial Lecturer, Brown University  
 2005 Elected Corresponding Member, International Academy of Astronautics (Life Sciences)  
 2004 Elected Fellow, California Academy of Sciences  
 2004 Elected Fellow, The Explorer's Club (FN'04)  
 2004 NASA Outstanding Achievement Award  
 2002 Keynote Speaker, Vatican, and Windsor Castle  
 2002-3 President, Society of Protozoologists  
 2001 Auger Fellow, Hotchkiss School  
 2000 NASA Group Achievement Award, Astrobiology Team  
 1999 Elected Fellow, Linnean Society of London  
 1990, 1998 Jack N. Nielson Award, NASA Ames Research Center  
 1987-90 National Academy of Sciences NRC Research Associate  
 1987 National Research Council Fellowship, Canada (declined to accept NAS NRC)  
 1979 University Fellowship, Indiana University

## professional activities

### Journals, Societies, Boards

2024- Advisory Board, Engineered Living Materials Institute @ Cornell  
 2024- Advisory Board, E-RISE RII: Maine Algal Research Infrastructure and Accelerator (MARIA), Bigelow Labs  
 2016-7 Editorial Board, LIFE  
 2001-2005 Founding co Editor-in-Chief, International Journal of Astrobiology; Editorial Board  
 2004-5 Executive Council, International Society of Protistology  
 2001-4 Executive Council, Society of Protozoologists  
 1998-2002 Editorial Board, Origins of Life and Evolution of the Biosphere  
 1995-1998 Grants and Fellowship Committee, Phycological Society of America  
 1995-2000 Board of Reviewers, Journal of Eukaryotic Microbiology  
 1994-2000 Elected Secretary (3 terms), International Society for Evolutionary Protistology  
 2000-2002 North American Councilor, International Society for Evolutionary Protistology  
 1994-5 Elected Chairman of Nominating Committee, Society of Protozoologists  
 1993 Member, Global Emiliania Modelling Initiative  
 1992; 2000 Elected to Nominating Committee, Society of Protozoologists  
 1990-4 Executive Council, International Society for Evolutionary Protistology

## Meetings Organized

- 2018, 2020 Build-A-Cell, Stanford 2018; NASA Ames Jan 2020
- 2015 SOC, COSPAR 2016 F3.1/3.5 Astrochemistry, Astrobiology, and The Formation of Life in the Universe, COSPAR Istanbul Scientific Assembly, summer 2016 (meeting cancelled)
- 2011 São Paulo Advanced School of Astrobiology, University of São Paulo, Brazil
- 2011 Evolution, Astrobiology, and Synthetic Biology: Defining the Common Foundations, National Evolutionary Synthesis Center, Duke University with Allen Rodrigo
- 2005 Geology and Habitability of Terrestrial Planets, International Space Studies Institute, Bern, Switzerland
- 2004 Third Astrobiology Science Conference, NASA Ames Research Center
- 2002 Second Astrobiology Science Conference, NASA Ames Research Center
- 2001 NASA Astrobiology Institute/NIH joint conference, NIH, Bethesda
- 2000 First Astrobiology Science Conference, NASA Ames Research Center
- 1999 Evolution on Planet Earth, The Impact of the Physical Environment, Linnean Society, London
- 1999 Evolution of the carbon cycle (International Botanical Congress)
- 1997 Responses of photosynthetic organisms to global changes in CO<sub>2</sub>, Silwood Park, UK
- 1988 Evolution of symbiosis (International Society for Evolutionary Protistology)

## Representative Keynote Lectures, Invited Seminars and Symposia Lectures since 1995

- 2026 Invited seminar, YTC America, Yazaki (February)
- 2025 Invited keynote, Engineered Living Materials Symposium, Rice University (October)
- 2025 Invited keynote, Hermès Innovation Day, Paris (September)
- 2025 Invited keynote, Inaugural ARIA summit, London (May), <https://vimeo.com/1087848226/1ac592a8d4>
- 2025 Invited plenary, "Biomaterials", California College of the Arts (Feb)
- 2024 Invited plenary, FI Europe Summit, Frankfurt (November)
- 2024 Invited Keynote, Materials Research Society Spring Meeting, Seattle (April)
- 2024 "Hello Tomorrow" keynote, Paris, France (March)
- 2024 Invited Keynote, 26th North American Mushroom Conference 2024/ 20th Congress International Society for Mushroom Science
- 2023 Annual Graduate Student Lecture, Ecology and Evolution, Rutgers University (November)
- 2023 Frontiers Symposium, Bigelow Labs, Maine (October)
- 2023 Interstellar Symposium, (July) Montréal
- 2023 BioFutures Symposium, Northumbria University, UK (July)
- 2023 BioManufacturing, Ohio State (March)
- 2022 Materials Research Society (November)
- 2022 Applied Synthetic Biology in Europe conference (Edinburgh, November)
- 2022 Life in the Universe, NSF & Bulgarian Academy of Sciences (November)
- 2022 DTU BIOSUSTAIN, Novo Nordisk Foundation Center for Biosustainability (May)
- 2022 Fungal Biomaterials and Biofabrication (Penn State, May)
- 2022 MIT Bioengineering (April)
- 2022 American Chemical Society (March)
- 2022 31<sup>st</sup> Fungal Genetics conference (March)
- 2022 Leveraging Biology to Power Engineering Impact (March)
- 2021 EMBL PhD Symposium (December)
- 2021 Interstellar Symposium, IRG 2021 (September)
- 2021 Mars Innovation Forum (May)
- 2021 Ramon SpaceTech 2021 Conference, Israel (January, talk on youtube)

2020 SLAC Colloquium Series (Oct; <https://sites.slac.stanford.edu/colloquium/all-event-recordings>)  
 2020 MidAtlantic iGEM meetup (July)  
 2020 Israeli Plant Ecology Society (Weizmann Institute, February)  
 2020 Space Horizons, Brown University (February)  
 2019 SBD4 Synthetic Biology for Defense (Arlington, September)  
 2019 Yale's Integrated Graduate Program in Physics Engineering and Biology (PEB) (New Haven, June)  
 2019 Frontiers in Materials Science for the 21st Century (University of Rochester, May)  
 2019 Humans to Mars Panelist (Washington, DC May)  
 2019 Breakthrough Discuss Panelist (UC Berkeley, DC May)  
 2019 American Chemical Society symposium speaker (ACS, Orlando April)  
 2019 Center for the Utilization of Biological Engineering in Space (CUBES; UC Berkeley) (February)  
 2019 Space Horizons, Brown University (February)  
 2018 MIT Earth and Planetary Sciences (September)  
 2018 TechFestival, Copenhagen (September) [https://video.techfestival.co/lynn-rothschild-at-techfestival-2018-astrobiology?mc\\_cid=cfb2dda92c&mc\\_eid=12b618ed95](https://video.techfestival.co/lynn-rothschild-at-techfestival-2018-astrobiology?mc_cid=cfb2dda92c&mc_eid=12b618ed95)  
 2018 The Conference, Malmö, Sweden (September) <http://videos.theconference.se/dr-lynn-rothschild-designing-nature>  
 2018 McMaster University, Canada, public lecture sponsored by the Origins Institute (June)  
 2018 DTU BIOSUSTAIN, Novo Nordisk Foundation Center for Biosustainability (April)  
 2018 Breakthrough Discuss conference (April)  
 2017 Plant Biotechnology for Health and Sustainability Symposium, Michigan State (Oct)  
 2017 Berkeley Paleontology (September)  
 2017 Earth Life Science Institute, Tokyo Tech (August)  
 2017 Norwegian Physical Society, Tromsø (August)  
 2017 Yale University "Editing Nature" (April)  
 ([https://www.youtube.com/watch?time\\_continue=8&v=WP\\_bf6pWp5o](https://www.youtube.com/watch?time_continue=8&v=WP_bf6pWp5o))  
 2017 University of Newcastle, UK (April)  
 2017 Keynote, Microbiology Society, Synthetic Biology Symposium (April, Edinburgh)  
 2017 NASA HQ STMD (March)  
 2017 Harvard University Origins Institute (February)  
 2017 MIT Lincoln Labs (February)  
 2016 Lehigh University, Howard Hughes Medical Institute (HHMI) Visiting Scholar (Sept)  
 2016 Biomimicry Summit for Aerospace, Cleveland (Aug 2)  
 2016 Australasian Astrobiology Meeting (July 12)  
 2016 University of Leicester (March 22)  
 2016 Cambridge Philosophical Society (March 18)  
 2016 Houston Spaceport Frontiers Lecture series (spacefrontiers.rice.edu) (Jan 21)  
 2015 TU Delft, Department of Bionanoscience (Oct 9)  
 2015 Astrobiology Society of Britain (Sept 3)  
 2015 Synthetic Biology UK (Sept 1)  
 2015 NIST at Stanford (Aug 20)  
 2015 Carl Sagan Center Opening, Cornell University (May 9)  
 2015 Queens University, Belfast (Feb 25)  
 2015 Oberlin College, Oberlin, OH (Feb 12&13)  
 2015 Novo Nordisk Foundation Center for Biosustainability, Technical University of Denmark  
 2014 Optimal Production of High Value Compounds, Berkeley, CA (Nov 10)  
 2014 Inside 3D Printing, Santa Clara, CA (Oct 22)  
 2014 Oxford University, Dept. Biochemistry (Oct 17)  
 2014 AbGradE (European Astrobiology Graduate Students), Edinburgh, UK (Oct 9)  
 2014 LeMoyne College, Syracuse, NY (Sept 19)

2014 Refactored Materials, San Francisco (Sept 12)  
 2014 Northern California iGEM meetup, UCSC (Aug 15)  
 2014 American Chemical Society 248th National Meeting, San Francisco, CA (Aug 10)  
 2014 Freshwater Algae Course 2014, Kindrogan Field Centre, Perthshire, Scotland (June 23)  
 2014 University of Oregon (April 30)  
 2014 Institut Tecnológico y De Estudios Superiores De Monterrey, Campus Queretaro, Mexico  
 2014 SynBiCITE Synthetic Biology Conference, Imperial College, London  
 2014 Explorers Club, San Francisco, CA (Feb. 28)  
 2014 College of William and Mary (Feb. 26)  
 2013 Brazilian Synchrotron Light Laboratory, Campinas, Brazil (Dec. 17)  
 2013 UNESP, Bauru, Brazil (Dec. 17)  
 2013 PaleoSP, UFSCar-Sorocaba, Brazil (Dec. 16)  
 2013 Astrobio2013, Santiago, Chile (Dec. 10)  
 2013 University of Texas, Austin (Nov. 15)  
 2013 Keynote speaker, The 2013 Ward Francillon Time Symposium, CalTech (November)  
 2013 Keynote speaker, International Phycological Congress (August)  
 2013 Society of Biological Engineers lecture, Chalmers University (Gothenburg, Sweden, May 30)  
 2013 Astrobiology Series, University of Arizona (Tucson, May)  
 2013 Keynote speaker, Astrobiology Society of Britain (Edinburgh, April)  
 2013 Keynote speaker, Opening of the UK Centre for Astrobiology (Edinburgh, April)  
 2013 Università of Rome, Università di Roma Tor Vergata (Rome)  
 2012 Institute for Advanced Biosciences, Keio University, Tsuruoka, Japan, November 15  
 2012 Ecology, Evolutionary Biology and Behavior; Beacon Seminar, Michigan State University, Nov 8, 9  
 2012 iGEM World Competition, MIT  
 2012 NASA Space Grant Annual Meeting, Seattle  
 2012 Nordita, Stockholm, Sweden, October 18  
 2012 European Astrobiology Network Association (EANA), Stockholm, Sweden, October 16  
 2012 Wetsus 2012 Congress, Leeuwarden, The Netherlands, October 2  
 2012 Horizons Lecture, University of Bergen, Norway, September 27  
 2012 BioDesign, University of Cambridge, UK September 26  
 2012 1st Synthetic Biology Symposium, BioSint, 2012. Tec de Monterrey, Campus Querétaro. Sept. 22  
 2012 Live Interview @ Studio-X (LI@SX), Columbia Architecture School, May 7  
 2012 University of California Santa Cruz, May 1  
 2012 Rhode Island Space Grant Annual Meeting, April 27  
 2012 Planet Under Pressure, London, UK, March 27  
 2012 University of Michigan, Feb 15  
 2012 Planets around stellar remnants, Arecibo Observatory, Puerto Rico, Jan. 27  
 2011 iGEM World Competition, MIT November 6  
 2011 Northwestern University, November 2  
 2011 Metabolic Design 2011 Summit, San Diego, May 24  
 2011 Seven Pines Symposium, Stillwater, MN, May19  
 2011 Georgia Institute of Technology, April 29  
 2010 ESF-COST High-Level Research Conference Extreme Environmental Events, U Cambridge, Dec. 16  
 2010 Delaware Biotechnology Institute, Dec. 2  
 2010 NAI Workshop Without Walls. Molecular Paleontology & Resurrection: Rewinding the Tape of Life  
 2010 Keynote, 26th Boulder Conference on the History & Philosophy of Science, UC Boulder, October  
 2010 National Evolutionary Synthesis Center, Duke University, October  
 2010 Yale University, Frontiers in Paleontology and Geomicrobiology, May  
 2010 Center for Integrative Planetary Science (CIPS), UC Berkeley Astronomy Department, March  
 2010 Distinguished Lecturer in Planetary Science, University of Western Ontario, Canada, March

2009 Silicon Valley Astronomers Lecture Series, Mountain View, CA November  
 2009 Featured speaker, Helmholtz Alliance on 'Planetary Evolution and Life'. DLR Berlin, September  
 2009 Beckman Scholars invited speaker, Beckman Institute, July  
 2009 Tim Mutch Memorial Lecture, Brown University, April  
 2009 Commonwealth Club, Yale Club, (with Dr. George Coyne, SJ) February  
 2009 Ethical Culture Society, February  
 2009 Darwin Day, Stanford University, February  
 2008 SB4.0: Fourth International Conference on Synthetic Biology, Hong Kong, October  
 2008 Indiana University, September  
 2008 NASA Ames Research Center Director's Colloquium, July  
 2008 2008 Polar Technology Conference, SRI, April 26-27  
 2008 University of San Francisco  
 2008 Chemical Evolution and Origin of Life, Roorkee IIT, India, March  
 2008 Cyanobacteria in a lunar environment, NASA Ames January  
 2007 Royal Society of London, November  
 2007 University of Wageningen  
 2007 Institute of Microbiology, Chinese Academy of Sciences, May Beijing  
 2007 IAA 16th Humans in Space Conference, May Beijing  
 2007 2007 Polar Technology Conference, SRI, April 26-27  
 2007 New England Aquarium  
 2007 Lawrence Livermore National Laboratory  
 2006 Aarhus University, Aarhus, Denmark  
 2006 Stanford University  
 2006 Nordita Institute and Neils Bohr Institute, Copenhagen, Denmark  
 2006 The range of habitats for life on earth, AAAS Annual Meeting  
 2006 Astrobiology and the Moon, Astrobiology Science Conference 2006, Washington, D.C.  
 2005 Chico State University  
 2005 Scandinavian Society for Astrobiology, Oslo, Norway  
 2005 Wright Lecture, Boston Museum of Science  
 2005 Geology and Habitability of Terrestrial Planets, International Space Studies Institute, Bern  
 2005 Habitability around M-stars, SETI Institute  
 2005 McMaster University, Canada  
 2005 Woods Hole Oceanographic Institute  
 2005 Evolution and the Universe, Vatican Observatory Foundation  
 2005 University of San Francisco, Physics Department Seminar  
 2005 Western Photosynthesis Conference  
 2005 Macquarie University, Australia  
 2004 Early Mars Conference, Jackson Hole  
 2004 Fulbright Scholars, San Francisco  
 2003 AAAS, Astrobiology and Ethics  
 2003 UCLA, Wednesday Evening Evolution Group  
 2003 National Academy Committee on Origin and Evolution of Life  
 2003 University of Washington  
 2003 UC Davis, Department of Geology  
 2003 Pennsylvania State University  
 2003 NASA Headquarters  
 2003 Emergence, Stanford University  
 2003 Southern California Chapter, American Society for Microbiology  
 2003 Templeton Foundation Board of Directors  
 2003 Idaho State Accelerator

2003 UK Astrobiology Meeting, Cambridge  
 2002 Emergence, Granada  
 2002 Santa Clara University  
 2002 National Institute of Medical Science, London  
 2002 Society for General Microbiology, Loughborough, UK  
 2002 Lehigh University Foster Hewitt Lecture (Geological Sciences)  
 2002 AAAS Symposium  
 2002 Microbiology of Space Station, Tokyo  
 2001 Yale University, Evolution and Ecology Department  
 2001 Dean Lecture, California Academy of Sciences  
 2001 New Directions in Marine Biotechnology Symposium, Bodega Bay  
 2001 Connecticut High School Physics Teachers Institute  
 2001 Sonoma Astronomical Society  
 2001 DARPA  
 2000 Photobiology Congress  
 2000 Yale University, Department of Astronomy  
 2000 Evergreen College  
 2000 Astronomical Society of the Pacific  
 2000 Lockheed Martin  
 2000 Mt. Tamalpais Lecture Series  
 1999 Queens University Belfast  
 1999 Montana State University  
 1998 16th International Botanical Congress  
 1998 UC Berkeley  
 1998 California Academy of Sciences  
 1998 Iowa State University  
 1997 University College London  
 1996 National Institute of Water and Atmospheric Research  
 1995 American Society for Limnology and Oceanography  
 1995 Kennedy Space Center  
 1995 University of Colorado  
 1995 University of Rhode Island, Graduate School of Oceanography  
 1995 University of Connecticut, Storrs  
 1995 Yellowstone National Park

### Working Groups

2019-25 Synthetic Biology Working Group, under the Biological Sciences Subcommittee of the Committee on Science at NSTC (NASA representative)  
 2021 Synthetic Biology: Projected Scientific Breakthroughs in 2026-2031, Army Research Laboratory, Technology Forecasting Office  
 2021 NASA rep, NSC Interagency Policy Committee subIPC on Biotech/Biomanufacturing Initiative  
 2012-3 NASA rep, Synthetic Biology Working Group, under the National Science & Technology Council

### Advisory Boards

2025- NSF "E-RISE RII: Maine Algal Research Infrastructure and Accelerator" (Mike Lomax, PI)  
 2022- "Origins of Biology: How energy flow structures metabolism and heredity at the origin of life" (BBSRC, Nick Lane University College London, PI)  
 2021- External Advisory Committee, "Exploring Uncertainty and Risk in Contemporary Astrobiology" (Leverhume funded project, Peter Vickers Durham University PI)

2020-	The Hub for Biotechnology in the Built Environment (HBBE) (joint initiative between Newcastle University and Northumbria University)
2016-8	GeneLab Science Working and Advisory Group, NASA
2014-7	Foundation for Investing in Research on SETI Science and Technology (FIRSST), Berkeley
2014	UK Centre for Astrobiology Review Board
2014-9	iSSB Review Board (French synthetic biology consortium)
2013-8	International Advisory Board, Flowers Consortium (UK synthetic biology consortium)
2009-13	Advisor of the Brazilian Exobiology Program
2009-10	California Academy of Sciences MicroLife Initiative
2008-12	Center for Integrative Planetary Science (CIPS) at the University of California, Berkeley
2005	SHOT Mars Chambers
2005-9	Provosoli-Guillard Culture Collection (CCMP)
2001-4	New York Hall of Science
2000-3	Denver Museum of Nature and Science

### grants awarded<sup>1</sup>

2025-2031	"An off planet laundromat" (Mars Campaign Office, Rothschild PI)
2025-2026	"Detoxification of Mars Perchlorates" (Mars Campaign Office, Rothschild PI)
2024-7	"Evolutionary processes that drove the emergence and early distribution of life" NASA Science Mission Directorate Planetary Internal Scientist Funding Model (ISFM) Co-I with Mark Ditzler
2024-5	"An Off Planet Laundromat" (Center Innovation Fund, CIF, Rothschild PI)
2024-6	"Mycotecture off Planet" (NASA Institute for Advanced Concepts (NIAC) Phase 3, Rothschild, PI) Press release: <a href="https://www.nasa.gov/news-release/nasa-advances-research-to-grow-habitats-in-space-from-fungi/">https://www.nasa.gov/news-release/nasa-advances-research-to-grow-habitats-in-space-from-fungi/</a>
2024-5	"Defining the Figures of Merit for an On-demand Astropharmacy", (TRISH, Rothschild, PI)
2024-5	"Detoxifying Mars: the biocatalytic elimination of omnipresent perchlorates" (NASA Institute for Advanced Concepts (NIAC) Phase 1, Rothschild, PI)
2023-4	"Green Energy for the Red and Blue Planets" (Center Innovation Fund, CIF, Rothschild PI)
2023-4	"No longer inert: a tunable fungal display platform" (Ames Research Innovation Award (ARIA), Rothschild PI)
2023-2025	"A flexible, personalized, on-demand Astropharmacy" (NASA Institute for Advanced Concepts (NIAC) Phase 2, Rothschild, PI)
2023-4	"Biomineralization-Enabled Self-Growing Building Blocks for Habitat Outfitting on Mars" (NASA Institute for Advanced Concepts (NIAC) Phase 1, Congrui (Grace) Jin, PI)
2021-3	"Mycotecture off Planet" (NASA Institute for Advanced Concepts (NIAC) Phase 2, Rothschild, PI)
2021	"Understanding amyloids to prevent biofilm formation in space" (Ames Research Innovation Award, Rothschild PI)
2021	"Miniature biomimetic Swarms: A novel approach to remote sensing" (NASA Ames Innovation Fair)
2020	"Biological Nanowires: Self-Assembly of Complex Nanoelectronic Components from Biologically-Derived Precursors" (Center Innovation Fund)
2020-1	"An Astropharmacy" (NASA Institute for Advanced Concepts (NIAC) Phase 1, Rothschild, PI)
2020-3	"Space Synthetic Biology" (ESA Topical Team, Rothschild member)
2018-9	"Myco-architecture off planet: growing surface structures at destination" (NASA Institute for Advanced Concepts (NIAC) phase 1, Rothschild, PI)

<sup>1</sup> Not including proposals in review, or grants in support of iGEM

2019-24 "RCN Build-a-Cell: An Open Community Considering & Advancing the Construction of Synthetic Cells" (NSF RCN, Rothschild Co-I)

2018-20 "Biological Solutions for Sustainable Mining" (USGS; Rothschild Co-I)

2016-7 "Survey of Airborne Microorganisms in Earth's Stratosphere: Acquiring Samples in the Northern and Southern Hemisphere with Ride-Along Flights on NASA Aircraft" (NASA Science Innovation Fund; Rothschild Co-I)

2016-7 "A robust, cell-free production system for on-demand protein synthesis in space" (NASA Innovation Fund; Rothschild PI)

2016-7 "Urban biomining meets printable electronics: end-to-end at destination biological recycling and reprinting" (NASA Institute for Advanced Concepts (NIAC) phase 1, Rothschild, PI)

2016-9 "Low cost, disposable and field-deployable biosensors for real-time detection of wildlife diseases" (USGS Innovation Award)

2015-6 "Worms on Returned Mars Mission Science (WORMMS)" (UKSA, Rothschild Co-I)

2015-6 "Direct observation of co-evolution at the RNA-protein interface" (Science Innovation Fund, Rothschild Co-I)

2014-7 "Biomining" (Advanced Exploration Systems, NASA HQ, Rothschild, PI)

2014-5 "To the plumes of Enceladus and elsewhere: developing miniature electrochromatographic monolithic columns for the in situ analysis of extraterrestrial organic molecules and biomarkers" (NASA Innovation Fund; Rothschild PI)

2014- EuCROPIS satellite mission (NASA Director's Fund)

2013 "Biomaterials out of thin air: in situ, on-demand printing of advanced biocomposites" (NASA Institute for Advanced Concepts (NIAC) phase 1, Rothschild, PI)

2012, 2013 "Materials Manufactured from 3D Printed Synthetic Biology Arrays" (NASA Innovation Fund; Rothschild PI)

2012 "de novo evolution of genetic function" (NASA Synthetic Biology; Rothschild PI)

2012 "Digitization & 3D printing of a multicellular organism" (NASA Synthetic Bio; Rothschild PI)

2011-12 "A Synthetic Biology Tool Kit for Manned Missions Outside Low Earth Orbit" (NASA Innovation Fund; Rothschild PI)

2011-12 "Astrobiology-Scientific Ballooning: An Innovative Learning, Instruction and Field Experience Model to Increase the Aspirations of High School Students in STEM Careers" (NASA HQ, Terry Shehata, PI)

2010-13 "Reactive oxygen species on the early Earth: Exobiological implications" (Netherlands Organization for Scientific Work, Paul Mason, PI)

2010-11 "What are the potential roles for synthetic biology in NASA missions?" (Keck Foundation, Rothschild & Cumbers Co-PIs)

2009-13 "Canadian Astrobiology Training Program" (NSERC, Canada, L. Whyte, PI)

2009-13 "Early habitable environments and the evolution of complexity" (NASA Astrobiology Institute, D. DesMarais, PI)

2008-10 "Developing Multidisciplinary Astrobiology Research Infrastructure through Exploration of Extreme Environments at the Intersection of Maine's Metal Mining Past and the Gulf of Maine" (NASA EPSCoR RID award, M. Duboise, PI, Rothschild NASA Scientist)

2007-9 Sustaining the Maine ScienceCorps: Collaborative integration of research experiences and active learning into biosciences education (NSF International Supplement, M. Duboise, PI)

2007 Ames Strategic Investment funds, suborbital program. (Rothschild, PI, ARC)

2007-2009 Mars Environmental Simulator Studies (T.C. Onstott, PI, NAI DDF, \$253k)

2007-2008 Design, fabricate and test a laboratory simulator of extreme environments. (Deamer and Rothschild, PIs, ARP or UARC, \$25k)

2007 Use of Ocean Optics USB4000 for BioLaunch: Multidisciplinary Class Projects for Near-Space Missions, a joint project from Stanford University's HumBio 183 (Astrobiology and Space Exploration) and AA 236 (Spacecraft Design), Rothschild and Cutler, PIs (\$1k)

- 2007-8 BioLaunch: Multidisciplinary Class Projects for Near-Space Missions (Cutler and Rothschild, PIs, Alliance for Innovative Manufacturing at Stanford).
- 2007-8 Planning for Infrastructure Development in Environmental Microbiology, Microbial and Viral Ecology, and Bio-nanotechnology at the University of Southern Maine. (Maine Space Grant Consortium, M. Duboise, PI, Rothschild NASA mentor)
- 2003-8 Origins of Aerobic Metabolism, Iron, the Oxygen Transition, and Photosynthesis (NAI)
- 2003-8 Interplanetary Pioneers (NASA Astrobiology Institute)
- 2000-4 Survival of Terrestrial Microorganisms on Spacecraft Components and Analog Mars Soils under Simulated Martian Conditions (NASA Planetary Protection)
- 2003 Planetary Protection upgrade (\$36K)
- 2001-10 Yellowstone/Astrobiology outreach (NAI)
- 2001-2 Oxidative damage in Nature (\$136k)
- 2001-2 Iron Oxide: An Early Sunscreen for Photosynthetic Microbes? (\$80k)
- 2000-3 Life beyond the planet of origin: Microbes in Space (NAI, \$452k)
- 2000-1 Training for Oxygen: Peroxy in Rocks and Early Life (\$80k)
- 2000 Astrobiology Science Conference (\$70k)
- 2000-3 Survival of Terrestrial Microorganisms on Spacecraft Components and Analog Mars Soils under Simulated Martian Conditions (\$508k)
- 1999 Evolution on Planet Earth: The Impact of the Physical Environment \$10k)
- 1998-2000 Determining annual variation in effects of UV radiation on SF Bay plankton: A unique collaboration of NASA research and education (\$165k)
- 1998-2000 DNA damage repair in nature? (\$130k)
- 1997-8 Does UV radiation affect carbon isotope fractionation? (\$80k)
- 1994-5 Does the collapse of diatom blooms trigger coccolithophore blooms? (\$80k)
- 1991-4 Impact of CO<sub>2</sub> and day length on carbon metabolism on early earth (\$270k)
- 1991-2 Detection of autotrophic life on Mars by surveying for oxygen (\$70k)
- 1984-5 Evolution course; Incentive Grant, Brown University

### field experience

- 2009 Radiation and DNA damage on Mt. Everest (Scott Parazynski & Keith Cowing, collaborators)
- 2007 Measurement of UV radiation and its effects, a transect from Chile to Denmark (Bente Lomstein, University of Aarhus, collaborator)
- 2007, 2008 UV measurements, UV effects and microbial diversity, Rift Valley, Kenya
- 2005, 2007 Microbial diversity, UV measurements, and UV effects on the aquatic ecosystems, Andes
- 2004 Microbial diversity and UV effects on radioactive aquatic ecosystems, Australia
- 2004 Microbial diversity and UV effects on the highest altitude aquatic ecosystems, Bolivian Andes
- 1997-2001 UV effects on DNA damage and pigments in phytoplankton, San Francisco Bay
- 1990-present Carbon fluxes, DNA synthesis and DNA repair in microbial ecosystems, Yellowstone
- 1987-1990 Carbon fluxes and DNA synthesis in halophiles and mats, Baja California, Mexico
- 1996 Carbon fixation and DNA synthesis, New Zealand
- 1993-5 Chlorophyll a levels, Monterey Bay
- 1985-7 Carbon fluxes in marine intertidal in New England

### flight experience

- 2015- Co-I, BIOMEX (Biology and Mars Experiment) on EXPOSE-R2 attached outside on the Zvezda module of the International Space station (ISS)
- 2012- PI, PowerCell secondary payload on the DLR EuCROPIS satellite mission (launched 3 Dec 2018) <http://www.sciencefriday.com/articles/to-survive-on-mars-byo-bacteria/> ACTIVE

- 2012 Astrobiology Scientific Ballooning Program, Maine Space Grant (May 9, 3 balloons)
- 2011 BioLaunch B11 (110,000 feet; 8 Sept filmed by BBC)
- 2010 Mavericks Rocketry, Clotho project (flight July 2010)
- 2008 Stanford BioLaunch B08A&B high altitude balloon flight (106,654 ft; 32,508 m). (8 March)
- 2007 Stanford BioLaunch B07A (11 March), high altitude balloon flight (82,274 ft). Payload director and chief scientist ([http://docs.google.com/Doc?id=dgjt2j7\\_22dbqnh](http://docs.google.com/Doc?id=dgjt2j7_22dbqnh))  
BioLaunch B07C (9 June), high altitude balloon flight (92,000 ft). Payload director and chief scientist ([http://docs.google.com/Doc?id=dgjt2j7\\_22dbqnh](http://docs.google.com/Doc?id=dgjt2j7_22dbqnh))

### Research experience

- 2011-present Active projects include origin of life, radiation-resistant microbes, growing mycomaterials for habitats off planet, biomining, biomaterials, bioprinting, biological wires, paper-based biosensors, lunar mission, astropharmacy, detoxification of perchlorates on Mars, off planet laundromat, population dynamics in low resource environments
- 2015-7 Halophiles for Mars colonization
- 2008-15 Chroococciopsis phenotype, phylogeny and potential in synthetic biology
- 2007-10 Solar spectrum up to 32 km; effect of balloon flight on DNA damage
- 1987-2002 Effect of UV radiation on DNA synthesis, carbon metabolism and mutation/DNA repair. Evolution and ecology of carbon cycling and DNA synthesis in microbial communities. The relationship between diatom and coccolithophore blooms. Field studies of marine phytoplankton abundance and distribution. The evolution of biology carbon fixation, including enzyme evolution and stable carbon isotope fractionation (NASA Ames)
- 1985-7 The evolution of a multigene family: site-directed mutagenesis of yeast rDNA in vitro, and the selective impact of the mutated rDNA in the transformed host cell.
- 1981-5 Assessment of evolutionary relationships among protistan chloroplasts and cyanobacteria by structural and immunological comparisons of RuBPCase
- 1980-1 Isolation and bouyant density analysis of the nuclear DNA of the binucleate dinoflagellates
- 1977 The ultrastructural and biochemical nature of the costa, a motile organelle in the termite gut flagellates *Trichomonas gigantea* and *T. termopsisidis*

### iGEM (international Genetically Engineered Machine) competition

- 2019 Faculty advisor, Brown-Stanford-Princeton iGEM team, "Astropharmacy" (<http://2019.igem.org/Team:BrownStanfordPrinctn>) winner, Genscript iGEM award, top 100 Tech Briefs "Create the Future", <https://contest.techbriefs.com/2019/top-100>. iGEM gold medal and iGEMers award.
- 2018 Faculty advisor, Stanford-Brown-RISD iGEM team, "Myco for Mars" (<http://2018.igem.org/Team:Stanford-Brown-RISD>) runner up, best new composite part, best in manufacturing, bronze medal
- 2017 Faculty advisor, Stanford-Brown iGEM team, "Mars: getting there and staying there" (<http://2017.igem.org/Team:Stanford-Brown>), bronze medal
- 2016 Faculty advisor, Stanford-Brown iGEM team, "BioBalloon" (<http://2016.igem.org/Team:Stanford-Brown>) Blue ribbon sustainability, Maker Faire, winner, best measurement, gold medal, runner up for best in manufacturing) (see <https://news.brown.edu/articles/2016/10/igem>)
- 2015 Faculty advisor, Stanford-Brown iGEM team, "Self-folding Origami" (<http://2015.igem.org/Team:Stanford-Brown>), winner, manufacturing track, gold medal, nominated for best poster, best composite biobrick and best biobrick collection) (see <https://www.calacademy.org/explore-science/packing-for-space>,

- <https://www.newscientist.com/article/dn28532-bacteria-build-bendy-plastic-that-astronauts-could-use-for-tools/>
- 2014 Faculty advisor, Stanford-Brown-Spelman iGEM team, "Towards a biodegradable UAV" <http://2014.igem.org/Team:StanfordBrownSpelman#SBS%20iGEM> (gold medal). Projects: Biomaterials, Waterproofing, Cellulose linker, Amberless Hell Cell, Biodegradation. This project has generated enormous attention, from Discovery Canada to Popular Mechanics, Tech Times, Tech Week Europe UK, Fast Company, Ubergizmo, Mirror UK, Toronto Star, Autoevolution, Le Monde, Olhar Digital, International Business Times Italia, Endgadget, Forbes, Atlantic Tech, Wired UK, Exec Gov, Washington Post, CNN tech
- 2013 Faculty advisor, Stanford-Brown iGEM team, "Synthetic BioCommunication" <http://2013.igem.org/Team:Stanford-Brown> (gold medal, finalist). Projects: BioWires, CrisprCas, De-Extinction, EuCROPIS
- 2012 Faculty advisor, Stanford-Brown iGEM team, "Synthetic Astrobiology" <http://2012.igem.org/Team:Stanford-Brown> (winner, "Best New Part", Western Regionals; "Top 16" World Championship; honorable mention "Human Practices" Western Regional and World). Projects: Hell Cell, Biomining, Venus Life (<http://www.calacademy.org/sciencetoday/igem-competition/>) (<http://www.calacademy.org/sciencetoday/igem-competition/>)
- 2011 Faculty advisor, Brown-Stanford iGEM team, "Mars BioTools: Synthetic Biology for Space Exploration" <http://2011.igem.org/Team:Brown-Stanford> (winner, two Editors Choice blue ribbons, Maker Faire Sept. 2011, iGEM gold medal, "Best Presentation" and final four, Americas; sweet 16 and Best New Application, World Championship). Projects: RegoBrick, PowerCell (also see <http://www.calacademy.org/sciencetoday/igem-competition/>)

### Summary of courses taught

"Astrobiology and Space Exploration", Stanford University (2003-2013; 2025 as EPS183)

### summary of additional experience and awards

Postdoctoral Fellow Supervision: Charles Cockell, Julie Bartley, Jamie Foster, Stefan Leuko, Ivan Paulino-Lima, Daiki Horikawa, Kosuke Fujishima, Nils Aversch, Tomasz Zajkowski, Garrett Roberts Kingman, Rolando Cruz Perez, Jessica Snyder. Current: Alina Kunitskaya, Devan Nisson (postdocs), Garrett Roberts Kingman, Rolando Cruz Perez, Jessica Snyder (staff scientists)

- 2025-7 Masters of Biotechnology supervisor, Shawna Mobila (Brown University)
- 2025-9 NASA supervisor of Ph.D. Student and NASA Space Technology Fellow, Adrianna Hudyma (University of Minnesota)
- 2024-8 NASA supervisor of Ph.D. Student and NASA Space Technology Fellow, Karol Woloszyn (New York University)
- 2024 visiting Ph.D. student Ana Gabriela Veiga Sepulchro (Danish Technical University)
- 2023-4 Supervisor, senior thesis Justin Kipness, Rebecca Blum, Cagn Walker (Brown University)
- 2022-3 Supervisor, Masters student Karoli Clever (UC Santa Cruz)
- 2022-3 Supervisor, Masters student Cynthia Bui (Brown University)
- 2022 Co-advisor, Nicolas Fuentes Musitu, "Myco-Algae Composites for Space Architecture: Strain Engineering of Mycelium grown in Cyanobacterial Substrates" DTU (September)
- 2022 Thesis examiner, Carolyn Bayer, "Engineering Bacterial Genomes throughout the Central Dogma of Molecular Biology" DTU BIOSUSTAIN (May)
- 2022-3 Supervisor, visiting Ph.D. student Alec Vallota-Eastman (UC Santa Barbara)
- 2020 Supervisor, Masters student Arvind Veluvali (Brown University)
- 2020 Supervisor, visiting Ph.D. student Rainbow Lo (Imperial College London)

2019 Supervisor, Masters student Monika Lipinska (International Space University)

2019-21 Supervisor, Ph.D. student Amanda Carbajal (UC Santa Cruz)

2017-8 Supervisor, Ph.D. student Benjamin Lehner (TU Delft, The Netherlands)

2017-8 Supervisor, Master's student Gustaf Edman (Chalmers University, Sweden)

2017-8 Supervisor, Master's student Dylan Spangle (Bioengineering, Brown University),  
 "Dissolution of silica by *Methanosarcina thermophila* silicase enzyme expressed in  
*Escherichia coli* for use in recycling electronic waste."  
<https://repository.library.brown.edu/studio/item/bdr:792922/>

2017 Supervisor, Master's student Clément Lapierre (SynSys Sup'Biotech, Paris)

2016,7 Masters Student, Ryan Lorig-Roach (UC Santa Cruz, summer 2016 and 2017)

2017 Masters Student, Alessandro Napoli (Università di Roma Tor Vergata, Italy)

2016 CT Space Grant awardee Cerys Hostage, supervisor

2016 TV interview and lecture, University of Southern Queensland, Toowoomba Campus

2016 Guest lecture, Vatican Observatory Summer School

2014-7 Ph.D. Student, Tom Folliard (Biochemistry, University of Oxford) synthetic biology

2014-9 NASA supervisor of Ph.D. Student and NASA Space Technology Fellow, Simon Vecchioni  
 (Columbia University) Building BioWires

2014-8 Co-Supervisor, Ph.D. Student, Cyprien Verseux (Università di Roma Tor Vergata)  
 engineering artificial extremophiles

2014-7 Supervisor, Ph.D. Student, Toshitaka Matsubara (Department of Bioengineering, Tokyo  
 Institute of Technology), engineering halophiles (defended, 2017)

2014 Supervisor, Masters student Carlos Alexander Ruiz Pérez (Columbian Center for  
 Genomics and Bioinformatics of Extreme Environments -- GeBiX) microbiome of Andean  
 plants

2013-4 Supervisor, Masters student Raphael Ferreria (Synthetic & Systems Biology Sorbonne  
 Paris – Diderot University - ParisTech)

2013 Supervisor, NASA Planetary Biology Intern, Siddharth Hegde (Max Plank Institut for  
 Astronomie) pigment bio-signatures on extrasolar planets

2013 Supervisor, Masters student Cyprien Verseux (University of Évreux-Val-d'Essonne)

2012 NASA Mentor, NASA OCT fellow Lucas Hartsough (Rice University)

2012-8 Ph.D. thesis advisor, Jesica Navarette (Microbiology, . California Santa Cruz) Biomining

2011 Faculty member, São Paulo Advanced School of Astrobiology (U. of São Paulo, Brazil)

2011-2 Mentor, NASA Space Technology Research Fellow Lucas Hartsough (Rice University)

2011 Advisor, NASA Academy student Jesica Navarette (University of Texas El Paso)

2011-8 Postdoctoral advisor, Kosuke Fujishima (Japan, Origin of Life)

2011-4 NPP postdoctoral advisor, Ivan Paulino-Lima (Brazil, radiation resistance under high Mn)

2010 Supervisor, NASA Planetary Biology Intern, Haley Sapers (University of Western Ontario)

2010 Ph.D. thesis examiner, Ivan Paulino-Lima, Instituto de Biofísica Carlos Chagas Filho,  
 Universidade Federal do Rio de Janeiro, Brazil

2004-13 Professor "Astrobiology and Space Exploration", Stanford University (HumBio 183). This  
 course is available through our course website,  
<http://www.stanford.edu/group/astrobiology/cgi-bin/> as well as featured on iTunesU,  
 youtube, Academic Earth, etc.

2009-15 Ph.D. thesis advisor, Diana Gentry, Stanford University

2009 Professor "Extent of the Biosphere", Stanford University

2009 Ph.D. thesis reviewer, Philip Butterworth, McQuarie University, Australia

2008-11 Ph.D. thesis advisor, John Cumbers, Brown University

2009- 11 Lecturer in AP Biology Classes, Carlmont High School (CA)

2008-11 NPP postdoctoral advisor, Stefan Leuko

2008-10 NPP postdoctoral advisor, Daiki Horikawa

2008-9 Master's thesis advisor, Adam Monroe, Stanford University  
 2008 Ph.D. thesis reviewer, Falcia Qi Yun Goh, University of New South Wales, Australia  
 2007 Professor "Aerobiology", Stanford University  
 2007 Master's thesis advisor, Adam Freedman, Stanford University  
 2007 Supervisor, François Picard & Melike Balk, Effect of peroxy defects on aerobic metabolism  
 2006 Opponent, Ph.D. defense, Aarhus University, Denmark  
 2006 Professor, "Is evolution predictable?", Stanford University  
 2005-6 Honors Thesis advisor, Mamei Sun, Stanford University  
 2005-6 Co-term advisor, Erin Lashnits, Stanford University  
 2005 Supervisor, NASA Planetary Biology Intern, Stefan Leuko, University of New South Wales,  
 2004-5 Honors thesis advisor, Erin Lashnits, Stanford University  
 2004 Ph.D. Thesis Committee, Rebekah Shepard (U.C. Davis, Geology)  
 2003-6 NIH postdoctoral fellow advisor, Jamie Foster  
 2003 Lecturer at Crystal Springs Upland (CA)  
 2001 Lecturer at Greenwich High School (CT)  
 2000 Supervisor, Masters student from the International Space University (Jacqueline Garget)  
 1998-2002 Teaching/research project on the effect of UV on the plankton of SF Bay. Involved students from grades 3-12 in field research.  
 1993-present National Research Council Post-Doctoral Fellow Advisor (three accepted)  
 1998-2002 Supervisor, Astrobiology Academy fellowship students  
 1992-2000 Supervisor, NASA Planetary Biology Intern (students from UK and US)  
 1996 Supervisor, Honors Thesis, Stanford  
 1995 Supervisor, High School Space Biology Interns (12 over 9 years)  
 1992-3 Supervisor, Senior Thesis, Stanford University (Ben Squires)  
 1986-7 Shoals Marine Station (Cornell & U. New Hampshire) faculty Field Marine Science  
 1985 Brown University, Teaching Fellow, designed and taught course "Evolution"  
 1982-4 Brown University, Teaching Assistant, Evolutionary Genetics, Botany, Molecular Biology, Invertebrates, Microbial Ecology in Aquatic Environments, Medical Microbiology  
 1979 University of Maryland, Teaching Assistant, Zoology  
 1978-81 Indiana University, Associate Instructor, Ecology & Evolution, Invertebrates, Parasitology, Introductory Biology

Teaching interests: astrobiology and space exploration, biomaterials/biomimetics, environmental influences on evolution, biological payloads, major transitions in evolution evolution/paleobiology, protistology

## patents

"System for the 3D construction of biologically derived materials, structures and parts" U.S. Patent No. 10,815,474, issued on October 27, 2020. Innovators: Diana Gentry, Christopher Venter, **Lynn Rothschild**

"Functionalizing biological substrates with bioengineered peptides to bind targeted molecules for utilization in water filtration applications" U.S. Patent No. **12,116,420 B1**, issued on October 15, 2024. Innovators: **Lynn Rothschild**, Jessica Urbina, Advait Patel

## publications<sup>2</sup>

Massa, A, M. Delgado, Placeres, E. Axpe, L.J. Rothschild, & C. Carrero-Carralero. 2026. *Rhizopus oligosporus* biomass as a food ingredient for sweet and savory emulsions: a comparative consumer

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<sup>2</sup>published or accepted.

study to enhance product development biodiversity. *International Journal of Gastronomy and Food Science*

- Blum, Omrani, Kunitskaya, Snyder, Bui, Williams, Loftus & Rothschild. 2026. The database of peptide medications for human deep space missions demonstrates potential for on-demand "Astropharmacy". *Frontiers in Space Technologies*, vol 6. <https://doi.org/10.3389/frspt.2025.1692554>
- Porterfield, Marshal D, Tulodziecki D, Wheeler R, Davis Cross MK, Monje O, **Rothschild** LJ, Barker RJ, Schwertz H, Collicott S, Dutta S. 2025. Critical investments in bioregenerative life support systems for bioastronautics and sustainable lunar exploration. *NPJ Microgravity*. 16;11(1):57. doi: [10.1038/s41526-025-00518-4](https://doi.org/10.1038/s41526-025-00518-4).
- Massa A., Del Llano R. C, M. Baiget, Axpe E., **Rothschild** L.J., Sanz M.L., Carrero-Carralero C. 2025. Fermentation of *Monascus purpureus* biomass as a new protein-rich food ingredient. *Process Biochemistry*,158:118-128, [doi.org/10.1016/j.procbio.2025.08.008](https://doi.org/10.1016/j.procbio.2025.08.008).
- Onofri, S., Moeller, R., Billi, D., Balsamo, M., Becker, A., Benvenuto, E., Cassaro, A., Catanzaro, I., Cockell, C., Desiderio, A., Ellis, T., Gonzalez Pastor, J.E., Hahn, C., Leys, N., Leo, P., Maurel, M-C., Pacelli, C., Pavletic, B., Ripa, C., **Rothschild**, L.J. & Surdo, L. Synthetic biology for Space Exploration. *Nature Microgravity*, **11**, 41. [doi.org/10.1038/s41526-025-00488-7](https://doi.org/10.1038/s41526-025-00488-7)
- Cordero, RJB, de Grow, KK., Dragotakes, Q., Singla, S., Maurer, C., Trunek, A., Chiu, A., Hwang, J., Crowell, S., Benyo, T., Thon, SM., **Rothschild**, L.J., Dhinojwala, A., and A. Casadevall. 2025. Radiation Protection and Structural Stability of Fungal Melanin Polylactic Acid Biocomposites in Low Earth Orbit. *PNAS* 122 (18) e2427118122. [doi.org/10.1073/pnas.2427118122](https://doi.org/10.1073/pnas.2427118122)
- Roberts Kingman, G., Kipness, J.L. & **Rothschild**, L.J. 2025. Raiding nature's genetic toolbox for UV-C resistance by functional metagenomics. *Sci Rep* **15**, 223. [doi.org/10.1038/s41598-024-83952-w](https://doi.org/10.1038/s41598-024-83952-w)
- Abil, Z., Giaveri, S., Erb, T. and **Rothschild**, L. 2024. Integrating metabolism and evolution towards the realization of synthetic life. *Nature Rev. Bioengineering*. <https://doi.org/10.1038/s44222-024-00267-1>
- Ginter T, Dujardin A, Roumans S, **Rothschild** LJ, Rheinstädter MC. Environmental constraints on the origin of life based on membrane formation: the role of salinity. *Internatl J Astrobiology*. 2024;23:e25. [doi:10.1017/S147355042400020X](https://doi.org/10.1017/S147355042400020X)
- Massa , A., Baiget, M., **Rothschild**, L.J., Axpe, E., and Carrero-Carralero, C. 2024. New food ingredient via acid-tolerant *Rhizopus oligorporus* growth, *Applied Food Research*, vol 4, issue 2, doi: <https://doi.org/10.1016/j.afres.2024.100583>
- Vora, T.J., Aversch, N.J.H., DeBenedictis, E.A. and **Rothschild**, L.J. 2024. Space Synthetic Biology: a Paradigm for Sustainability on Earth and Beyond. *New Space* (published online) <https://doi.org/10.1089/space.2024.0002>
- Rothschild**, L.J., Aversch, N.J.H., Strychalski , E., Moser, F., Glass, J.I., Cruz Perez, R., Yekinni, I.O., Rothschild-Mancinelli, B., Roberts Kingman, G.A., Wu, F., Waeterschoot, J., Ioannou, I.A., Jewett, M.C., Liu, A.P., Noireaux, V., Sorenson, C., and Adamala, K.P. 2024. Building Synthetic Cells – from the Technology Infrastructure to Cellular Entities. *ACS Synthetic Biology*. **13**, 4, 974–997. <https://pubs.acs.org/doi/epdf/10.1021/acssynbio.3c00724>
- Vallota-Eastman, A., Bui, C., Williams, P., Valentine, D.L., Loftus, D., **Rothschild**, L.J. 2023. Bacillus subtilis engineered for aerospace medicine: a platform for on-demand production of pharmaceutical peptides. *Frontiers in Space Technologies* Vol 4 [doi.org/10.3389/frspt.2023.1181843](https://doi.org/10.3389/frspt.2023.1181843)
- Brandon Lu, Yoel P. Ohayon, Karol Woloszyn, Chu-fan Yang, Jesse B. Yoder, Lynn J. **Rothschild**, Shalom J. Wind, Wayne A. Hendrickson, Chengde Mao, Nadrian C. Seeman, James W. Canary, Ruojie Sha, and Simon Vecchioni. 2023. Heterobimetallic Base Pair Programming in Designer 3D DNA Crystals. *J. Am. Chem. Soc.*, 145, 32, 17945–53. [doi.org/10.1021/jacs.3c05478](https://doi.org/10.1021/jacs.3c05478)

- Zajkowski T, Lee MD, Sharma S, Vallota-Eastman A, Kuska M, Malczewska M, **Rothschild** L.J. 2023. Conserved functions of prion candidates suggest a primeval role of protein self-templating. *EINS: Structure, Function, and Bioinformatics*. Sep;91(9):1298-1315. doi: [10.1002/prot.26558](https://doi.org/10.1002/prot.26558)
- Vecchioni, S., Lu, B., Livernois, W., Ohayon, Y. P., Yoder, J. B., Yang, C.-F., Woloszyn, K., Bernfeld, W., Anantram, M. P., Canary, J. W., Hendrickson, W. A., **Rothschild**, L. J., Mao, C., Wind, S. J., Seeman, N. C., Sha, R., 2023. Metal-Mediated DNA Nanotechnology in 3D: Structural Library by Templated Diffraction. *Adv. Mater.* 35, 2210938. <https://doi.org/10.1002/adma.202210938>
- Gallego Fernandez, B., **Rothschild**, L.J., Fagliarone, C., Chiavarini, S. & Billi, D. 2023. Feasibility as feedstock of the cyanobacterium *Chroococcidiopsis* sp. 029 cultivated with urine-supplemented Moon and Mars regolith simulants. *Algal Research* 71: 103044 [doi.org/10.1016/j.algal.2023.103044](https://doi.org/10.1016/j.algal.2023.103044)
- Vickers, P., Cowie, C., Dick, S.J., Gillen, C., Jeancolas, C., **Rothschild**, L.J. and McMahon, S. Confidence of Life Detection: The Problem of Unconceived Alternatives. *Astrobiology* online ahead of print [doi.org/10.1089/ast.2022.0084](https://doi.org/10.1089/ast.2022.0084)
- Vecchioni, S., Sha, R., Seeman, N.C., **Rothschild**, L.J., and Wind, S.J. 2023. DNA by Design: De novo computational framework for DNA sequence design and nanotechnology. *Journal of Self-Assembly and Molecular Electronics* 1: 17–76. doi: [10.13052/jsame2245-8824.2022.002](https://doi.org/10.13052/jsame2245-8824.2022.002)
- Lipińska, M., Maurer, C., Morrow, R., Dade-Robertson, M., Senesky, Magdalini Theodoridou, D., Zhang, M. and **Rothschild**, L. 2022. Biological Growth as an Alternative Approach to On and Off-Earth Construction. *Frontiers in Built Environment*/ 19 September 2022 [doi.org/10.3389/fbuil.2022.965145](https://doi.org/10.3389/fbuil.2022.965145)
- Baqué M, Backhaus T, Meeßen J, Hanke F, Böttger U, Ramkissoo N, Olsson-Francis K, Baumgärtner M, Billi D, Cassaro A, de la Torre Noetzel R, Demets R, Edwards H, Ehrenfreund P, Elsaesser A, Foing B, Foucher F, Huwe B, Joshi J, Kozyrovska N, Lasch P, Lee N, Leuko S, Onofri S, Ott S, Pacelli C, Rabbow E, **Rothschild** L, Schulze-Makuch D, Selbmann L, Serrano P, Szewzyk U, Verseux C, Wagner D, Westall F, Zucconi L, de Vera JP. 2022, Biosignature stability in space enables their use for life detection on Mars. *Sci Adv*. Sep 9;8(36):eabn7412. doi: [10.1126/sciadv.abn7412](https://doi.org/10.1126/sciadv.abn7412).
- Limaye, S., Mogul, R., Baines, K.H., Bullock, M.A., Cockell, C., Cutts, J.A., Gentry, D.M., Grinspoon, D.H., Head, J.W., Jessup, K-L., Kompanichenko, V., Yeon Joo Lee, Mathies, R., Milojevic, T., Pertzborn, R.A., **Rothschild**, L., Sasaki, S., Schulze-Makuch, D., Smith, D.J., and Way, M.J. 2021. Venus, an Astrobiology Target. *Astrobiology*, 21(8) DOI: [10.1089/ast.2020.2268](https://doi.org/10.1089/ast.2020.2268)
- Zajkowski, T., Lee, M.D., Mondal, S.S., Carbajal, A., Dec, R., Brennock, P.D, Piast, R.W., Snyder, J.E., Bense, N.B., Dzwolak, W., Jarosz, D.F., & **Rothschild**, L.J. 2021. The hunt for ancient prions: Archaeal prion-like domains form amyloids and substitute for yeast prion domains. *Molecular Biology and Evolution*. 38(5):2088–2103. doi: [10.1093/molbev/msab010](https://doi.org/10.1093/molbev/msab010)
- Reyes, S.G., Kuruma, Y., Fujimi, M., Yamazaki, M., Eto, S., Tamaki, S., Kobayashi, A., Mizuuchi, R., **Rothschild**, L., Ditzler, M., Fujishima, K. 2021. PURE mRNA display and cDNA display provide rapid detection of core epitope motif via high-throughput sequencing. *Biotechnol Bioeng*. 118(4): 1702-15 [doi.org/10.1002/bit.27696](https://doi.org/10.1002/bit.27696)
- Billi, D., Fernandez, B.G., Fagliarone, Chiavarini, C.S., & **Rothschild**, L.J. 2020. Exploiting a perchlorate-tolerant desert cyanobacterium to support bacterial growth for in-situ resource utilization on Mars. *Internatl. J. Astrobiol.* 20(1), 29-35. doi: [10.1017/S1473550420000300](https://doi.org/10.1017/S1473550420000300)
- Volger, R., Pettersson, G.M., Brouns, S.J.J., **Rothschild**, L.J., Cowley, A., & Lehner, B.A.E. 2020. Mining moon & mars with microbes: Biological approaches to extract iron from Lunar and Martian regolith. *Planetary & Space Science*, 184: 104850 <https://doi.org/10.1016/j.pss.2020.104850>
- Urbina, J., Patil, A., Fujishima, K., Paulino-Lima, I.G., Saltikov, C, & **Rothschild**, L.J. 2019. Urban biomining: A new approach to bioengineering surfaces for reclaiming and recycling metals from e-waste. *Scientific Reports, Nature Publishing Group* 9:16422 [doi.org/10.1038/s41598-019-52778-2](https://doi.org/10.1038/s41598-019-52778-2)
- Mosca, C., **Rothschild**, L.J., Napoli, A., Ferre F., Pietrosanto, M., Fagliarone, C., Baqué, Raboow, E., Rettberg, P, & Billi, D. 2019. Over-expression of UV-damage DNA repair genes and ribonucleic acid persistence contribute to the resilience of dried biofilms of the desert cyanobacterium

- Chroococcidiopsis* exposed to Mars-like UV flux and long-term desiccation. *Frontiers in Microbiology* 10: 2312. doi: [10.3389/fmicb.2019.02312](https://doi.org/10.3389/fmicb.2019.02312)
- Snyder, J.E., Walsh, D., Carr, P. & **Rothschild**, L.J. 2019. A Makerspace for Life Support Systems in Space. *Trends in Biotechnology* 37: 1164-74. <https://doi.org/10.1016/j.tibtech.2019.05.003>
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### publications (books)

- Rothschild**, L.J. & A. Lister (eds.) 2003. *Evolution on Planet Earth: The Impact of the Physical Environment*. Academic Press. 456 pp. ISBN: 0-12-598655-6

### book chapters, conference proceedings, white papers

- Kunitzskaya, A., Snyder, JE, Blum, RC, Omrani, D., Loftus, DJ & **Rothschild**, L.J. 2025. Astropharmacy: in-space pharmaceutical manufacturing for deep space missions. IAC-25,A2,8,6,x100751.  
DOI: <https://doi.org/10.52202/083075-0040>
- Roberts Kingman, G. and **Rothschild**, L.: Expanding the known limits of life through adaptive laboratory evolution, functional metagenomics, and synthetic biology, EGU General Assembly 2022, Vienna, Austria, 23–27 May 2022, EGU22-6794, <https://doi.org/10.5194/egusphere-egu22-6794>, 2022.
- Rothschild**, L.J., Maurer, C., Head, J.W., Lipińska, M.B., Senesky, D., Kornegay, K., Rheinstädter, M.C., Dade-Robertson, M., Musitu, N.F., Workman, C., Axpe, E., and Cadogan, D.. 2022. Mycotecture off planet: fungi as a building material on the Moon and Mars. 53<sup>rd</sup> Lunar and Planetary Science Conference, 15-19 March, 2021. LPI Contribution No. 2544.  
<https://www.hou.usra.edu/meetings/lpsc2022/pdf/2544.pdf>
- Rothschild**, L.J., Fujishima, K., Head, J.W. and Paulino-Lima, I. 2021. Synthetic biology and the search for life in the universe. 52nd Lunar and Planetary Science Conference, held virtually, 15-19 March, 2021. LPI Contribution No. 2548, id.2687
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- Becich, M., Sun, G.L., Hale-Phillips, C.A., Sihavong, T.N., Sievert, T.C., Le, A., Weissenbach, A.S., Gleason, C.R., Robinson, E.G., Liu, E.Y., Kalkus, T., Rogers, K.J. & **Rothschild**, L.J. 2017. Engineering a 'BioBalloon' for Mid-Atmospheric Sensing: Synthetic Biological Applications of Latex, Melanin, *Chlamydomonas reinhardtii*, Nucleic Acid Aptamers, and Chromogenic Proteins. *PLOS iGEM Realtime Peer Review Jamboree*. <http://blogs.plos.org/collections/igem-report-17-09/>
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- Rothschild**, L.J. 2003. The origin, evolution and distribution of life in the Universe. An Astrobiological perspective. In: Science and Theology: Ruminations on the Cosmos, edited by Chris Impey and Cathy Petry, Vatican Observatory Publication: Vatican 2003; distributed by the University of Notre Dame Press, Notre Dame, IN. pp. 129-148.
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### book reviews

- Rothschild**, L.J. 2007. The Living Universe. NASA and the development of Astrobiology by James Strick and Stephen Dick. Isis 98: 423-4.
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- Rothschild**, L.J. 1994. Tracing the History of Eukaryotic Cells, B.D. Dyer and R.A. Obar. Symbiosis 17: 255-256.
- Rothschild**, L.J. 1990. Handbook of the Protoctista, L. Margulis et al., eds. BioSystems 24: 175-176.

### popular articles

- Ward, D.M., Blumberg, B., Des Marais, D., Farmer, J., Hinman, N., Hoehler, T., Mancinelli, R., **Rothschild**, L.J. & Tsairides, C. 2005. Microbiology/Astrobiology in Yellowstone Resources and Issues 2004, Division of Interpretation, Yellowstone National Park.
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- Rothschild**, L.J. 2001. "Astrobiology". McGraw Hill Encyclopedia of Science & Technology, 2002. pp. 21-4 (First encyclopedia entry for "Astrobiology")

### other non peer-reviewed

- Rothschild**, L.J. 2010. Evolution, Synthetic Life, and The Tin Woodman Dilemma. *J. Cosmology* 8:
- Rothschild**, L.J. 2009. Life battered but unbowed. *Nature* (London) 459:335-6.
- Rothschild**, L.J. 2006. A microbiologist explodes the myth of the unculturables. *Nature* (London) 443: 239.

## Outreach since 1999

2025

Long Now Evening Talk San Francisco (October) <https://longnow.org/talks/02025-rothschild/>

Podcast, Future is Fungi (July) <https://podscan.fm/podcasts/the-future-is-fungi/episodes/fungi-and-the-future-of-space-exploration-w-dr-rothschild-amp-haveman-from-nasa>

Film for NHK, Japanese Public Television for "Human Journey" Episode: "Journey to the Moon and Mars" (Jan)

Interview for podcast "Curiosity Weekly" (Jan)

2024

Episode 132 of the This Week in Space podcast, titled "Living in Martian Mushrooms".

<https://www.space.com/entertainment/space-movies-shows/this-week-in-space-podcast-this-week-in-space-podcast-episode-132-living-martian-mushrooms>

Panel and Interview, Opening of Imperial College London's Food Centre, San Francisco, (29 Oct)

Interview, Planetary Society (11 September) <https://www.planetary.org/video/live-from-the-nasa-innovative-advanced-concepts-stage>

SMARC opening, Washington University (18 April)

Swissnex SF Panel on Extremophiles (11 April)

Filmed for French Global Television, Paris (21 March)

Spotlight on SETI podcast (5 Feb)

2023

Appeared on NOVA, "Ancient Earth: Birth of the Sky"

([https://www.youtube.com/watch?v=pmbUv0rAeeg&ab\\_channel=NOVAPBSOfficial](https://www.youtube.com/watch?v=pmbUv0rAeeg&ab_channel=NOVAPBSOfficial), Oct)

Interview with Universe Today youtube channel, Astropharmacy (April)

[https://www.youtube.com/watch?v=jvHEKqrdP9k&ab\\_channel=FraserCain](https://www.youtube.com/watch?v=jvHEKqrdP9k&ab_channel=FraserCain)

Interview with Will Adams, ed World Book Inc.'s "Out of this World" Series 3, about mycoarchitecture (Jan 23)

Symposium, "Life not as we know it", hosted by the Astronomy and Space Exploration Association (ASX), University of Toronto (10 Feb)

2022

Air and Space Magazine, Smithsonian, <https://airandspace.si.edu/air-and-space-quarterly/summer-2022/there-doctor-house>

Film, BBC for NOVA Episode on the Atmosphere (Aug 18)

Podcast, Yale iGEM team (July 8)

Interview, National Geographic (July 8)

NHK, Japan's Public TV, Documentary "Power of Microbes" re Synthetic Biology, Myco-architecture (June 30)

Orange Radio 94.0 (Vienna) Spacecuriosity (April 14)

Madeleine Gregory, reporter, Discover Magazine, article on mycotecture (March 31)

Leading Ladies of Aerospace, panel (February 24)

Interview with Michael Dalton, writer for The Week Junior Science+Nature (UK), about life and career for "Heroes in Science" profile (Jan 14)

Interview with Muriel Valin, journalist for Epsilon (French Science Magazine) about mycotecture (Jan 24)

2021

Interview with Theodore Anton for a book "about NASA's work in synthetic biology in space" (Dec 20)

Chabot Science Center re-opening talk (Nov)

The Daily Beast interview, mycotecture (Nov 8)

Wired interview, mycotecture (Nov 8)

Johns Hopkins' online science magazine "The Science Writer" (<https://www.thesciencewriter.org>).

Interview on mycotecture (Oct 4)

Wired, Here's a Sneak Peek at the Far-Out Future of Space Travel, mycotecture

<https://www.wired.com/story/heres-a-sneak-peek-at-the-far-out-future-of-space-travel/>

Interview, Air and Space magazine (Sept 10)

Mushroom Houses on Mars and the Future of Astronaut Habitats By Kaleigh Rogers (Sept 10)

<https://mailchi.mp/mcmaster/science-long-read-2?e=0a3c6124df>

Discover Magazine at <https://www.discovermagazine.com/the-sciences/space-is-expensive-can-3d-printing-and-on-orbit-construction-drive-the-cost> and Forbes

<https://www.forbes.com/sites/jamiecartereurope/2021/04/09/nasa-teases-a-mars-base-made-from-mushrooms-a-spacecraft-swarm-for-venus-and-a-telescope-on-the-moon/> .

2020

Interview, IFL Science, <https://www.iflscience.com/astropharmacy-and-a-telescope-on-the-moon-among-new-concepts-selected-for-nasa-funding-55653>

Interview, NeoLife <https://neo.life/2021/01/to-boldly-go-where-no-pharma-has-gone-before/>

Interview, The Guardian, <https://www.theguardian.com/science/2020/sep/05/are-aliens-hiding-in-plain-sight>

Interview, The Medicine Maker, <https://themedicinemaker.com/manufacture/the-astropharmacy-concept>

Lecture, Galaxy Forum, Vi at Palo Alto (July 4))

Interview, BBC Sky & Telescope (April 27)

Lecture, Rotary Club of Los Altos (Feb 27)

Interview for CBS, Orlando about Myco-architecture in space (Feb 3)

Interview for British Broadcasting Corporation (BBC) about Myco-architecture in space (Jan 27)

Interview for Forbes about Myco-architecture (Jan 21)

<https://www.forbes.com/sites/linhanhcat/2020/01/31/future-buildings-on-mars-made-of-mushrooms/>

Interview for "OneZero," about Myco-architecture (Jan 15)

2019

Filmed for "The Age of Innovation", Robert Downey Jr. production (Palo Alto, Sept. 20)

<https://www.youtube.com/watch?v=llvriKaNCRE> starting around 10.5 minutes

BYU Radio interview (Aug 20), NASA living tech, <http://www.byuradio.org/episode/9018efda-0cd6-4df8-94eb-a8864b031aa6/top-of-mind-with-julie-rose-kashmir-nasa-living-tech-name-recognition?playhead=1307&autoplay=true>

Filmed for Atlantic Productions (July 2)

Filmed for tested.com (June 13)

Filmed for tested.com (June 13)

Filmed for documentary on Stuart Brandt (May 19)

WonderTech Summit, Women in Technology (Copenhagen, May 11)

Recorded for "The SHABAM! Show." Talking to middle schoolers and high school students about microbes, space exploration and terraforming planets (March 28)

Space Day Panel, MIT (March 14)

BlueYard Capital, "Synthetic Biology for Space" (Feb 28)

Intelligence Squared USA, "Don't Bring Extinct Creatures Back to Life" (Jan 31)

<https://www.intelligencesquaredus.org/debates/dont-bring-extinct-creatures-back-life>

Wonderfest lecture, "Is there a Universal Biology?" (Jan 27)

2018

TEDx Beacon Street @ WGBH Boston (Oct 29) The living tech we need to support human life on other planets

[https://www.ted.com/talks/lynn\\_rothschild\\_the\\_living\\_tech\\_we\\_need\\_to\\_support\\_human\\_life\\_on\\_other\\_planets?utm\\_source=tedcomshare&utm\\_medium=email&utm\\_campaign=tedsread](https://www.ted.com/talks/lynn_rothschild_the_living_tech_we_need_to_support_human_life_on_other_planets?utm_source=tedcomshare&utm_medium=email&utm_campaign=tedsread)

lecturer for STEAM week, Los Altos High School (Oct 11)

Boston Museum of Science, "From Science Fiction to Science Fact" (Sept 22)

taped, podcast, Copenhagen with TechFestival

filming, BBC The Planets, Venus (July 16) Scheduled to air on NOVA in 2019

podcast, How Could Genetic Engineering Affect Space Exploration? - Offworld Episode 12 (YouTube series on [Tested](#)), <https://www.youtube.com/watch?v=Cc0HvImAuAY> published Oct 15

Wonderfest lecture, "Universal Biology?" <http://wonderfest.org/is-there-a-universal-biology-apr-8/>

ComiCon Panelist, "Pack Your Bags: We're Moving to Mars! (Eventually)", Silicon Valley Comic Con, Jason Lederman (Pop Sci), moderator. <http://www.svcomiccon.com>,

<https://www.nasa.gov/svcc2018>

lecture, "Where synthetic biology meets E.T." University of California Museum of Paleontology Short Course: Where worlds collide: How microbes from Earth's deep biosphere and extreme environments can teach us about our planet's history and shape its future.

<http://ucmp.berkeley.edu/about/shortcourses/shortcourse18.php> (Feb 24)

Darwin Day talk, Sunday Assembly Silicon Valley (Feb 11)

zdf/3sat filming, synbio for Mars exploration (Zdf/3sat is the scientific and cultural flagship program of the German, Austrian and Swiss public broadcasting channels

<http://www.3sat.de/mediathek/?mode=play&obj=72912>)

2017

Science Friday Trivia Quiz, NASA team, SF (Oct 30)

NOVA filming, synbio (Aug 4)

NIAC Presentations, Chicago Museum of Science and Industry (May 13)

Filming, Breakthrough Foundation (May 4)

NASA 360 podcast <https://www.nasa.gov/multimedia/podcasting/nasa360/index.html>

Filming, Motherboard/Vice (Feb 24) <https://www.youtube.com/watch?v=ukBenR6FjPo>

"How to hunt for aliens: finding Darwin beyond Planet Earth". Darwin Day, Yale Humanists (Feb 12)

"Are we alone? The search for life in the universe." Public Lecture, ELSI, Tokyo Institute of Technology (Jan 11)

2016

Shaping the Future, Campaign for Science and Education, 30<sup>th</sup> Anniversary Event, Senate House, London (Nov 14) <http://www.sciencecampaign.org.uk/our-work/campaigns/case-30th.html>

Brown University home page (Oct/Nov) <https://news.brown.edu/articles/2016/10/igem>

Popular Science (Nov 1) <http://www.popsci.com/can-we-bring-life-to-mars>

Interview, Sky News (Sept 7)

([https://www.youtube.com/watch?list=PLG8lrydigQfckEQNNdxoPiQ0GtAJLP5\\_5&v=CzqRYNNiHvc](https://www.youtube.com/watch?list=PLG8lrydigQfckEQNNdxoPiQ0GtAJLP5_5&v=CzqRYNNiHvc))

Interview, Science Friday (Aug 29)

Filming, Loyola Productions, educational video on evolution (Aug 8)

Filming, Essential Media and Entertainment (July, Australia, August, NASA Ames)

Two Queensland television spots, one University of Southern Queensland, Australia (July 19)

Radio Spot, 4GR, Southern Cross Austereo, Australia (July 18)

All Hallows School, Brisbane, lecture to students including surrounding schools (July 15)

London City College, lecture to students (May)

BBC Forum, Extremophiles (March 16)

Darwin Day talk, Sunday Assembly Silicon Valley (Feb 14) [http://sasv.podomatic.com/entry/2016-02-22T16\\_43\\_58-08\\_00](http://sasv.podomatic.com/entry/2016-02-22T16_43_58-08_00)

Public Lecture, San Mateo County Astronomical Society (Feb 5)

Podcast: The Star Spot (Toronto, Jan 30) <http://starspotpodcast.com/2016/03/20/making-life-lab-implications-alien-hunting-lynn-rothschild/>

Plenary, Astronomy and Space Exploration Society (ASX) at the University of Toronto 13<sup>th</sup> Space Science Symposium keynote (Jan 29)

2015

Filmed, BBC, "End of the solar system", Yellowstone National Park (Oct. 22-5)

BBC, Naked Scientists Radio Show "Mars Exploration" (Oct 18)

Carlmont High School Biotech Day (Oct 16)

Mt Tam Astronomy Program, CA (Aug 22)

Bay Area Maker Faire, San Mateo, CA, Main Stage talk (May 16)

<https://www.youtube.com/watch?v=5HfQReYgMlo&feature=youtu.be&list=PLwhkA66li5vBCWRVXAXbNPUswDYVrjZNX>

Huff Post Live filming (March 21) <http://live.huffingtonpost.com/r/segment/drone-zone-amazon-prime-air-/5517e8b52b8c2a7ca6001255>

Let's have an awesome time doing science! Berkeley (March 24)

<http://sci.berkeley.edu/?q=conference>

Henderson State University Physics club conversation (via skype)

Discovery Canada Channel, "Biodegradable drones" (<http://www.discovery.ca/dailyplanet>) aired (Jan 15)

2014

Filmed, Discovery Canada Channel, "Biodegradable drones", NASA Ames Research Center (Nov. 21)

Brandeis University 3D printing society (Nov 1)

Inside 3D printing, interview: NASA Looking at 3D Printing and Synthetic Biology for Mars, Earth. (Oct.)

<http://inside3dprinting.com/video-nasa-looking-at-3d-printing-and-synthetic-biology-for-mars-earth/>

Stanford Retirement Home VI, Palo Alto, CA (Sept 9)

Stanford LASER talk, "Synthetic Astrobiology", [https://www.youtube.com/watch?v=0ADV\\_gpj4CU](https://www.youtube.com/watch?v=0ADV_gpj4CU) (Aug. 10)

Idaho HS Scholars, NASA ARC (July 29)

Advanced Studies Lab, ARC (July 24)

TEDx, Santa Cruz (March 8), [https://www.youtube.com/watch?v=\\_h6o0EbCh\\_c](https://www.youtube.com/watch?v=_h6o0EbCh_c)

Darwin Day, Stanford (Feb 18)

Phi Beta Kapa of Northern California, Asilomar (Feb 16)

Sacramento Darwin Day Keynote Speaker (Feb 9)  
Commonwealth Club and Wonderfest, "A biologist and a chemist confer on the recipe for life" (Jan 14)

### 2013

Community Day, California Academy of Sciences with 2013 iGEM team (Oct 12)  
Lectured to Idaho Science and Aerospace Scholars ISAS (July 23)  
Presented at Maker Faire, Bay Area (May 18)  
Lecture, AP Bio Classes, Carlmont High School, Belmont, CA (March 15)

### 2012

Filmed, Discovery Channel, "Aliens", NASA Ames Research Center (Nov. 30)  
Taped, Radio Interview, Sveriges Radio (Swedish national radio) (Nov. 12)  
Filmed, California Academy of Sciences, iGEM (Oct. 12)  
Interviewed for Ciel et Espace (Oct. 16)  
Public lecture, Innovation in Space Discoveries: Is There Life Out There? University of Bergen, Norway (September 27)  
Public Lecture, "Life at the Edge: Life in Extreme Environments on Earth and the Search for Life in the Universe", San Jose Astronomical Association (February 4)

### 2011

TV interview, National TV in Brazil on location at PETAR caves,  
<http://www.tvtribuna.com/videos/?video=12730>  
Filmed, "New Frontiers in Ballooning",  
<http://www.polyhedronlearning.com/newfrontiers/marscityFrameset.html> (November 17)  
Featured lecture, Maker Faire, New York Hall of Science (September 17)  
Filmed, BBC Horizon "Synthetic Biology", Central Valley, California (September 8)  
Lecture, High School Teachers Online, "Life at the Edge: Life in Extreme Environments on Earth and the Search for Life in the Universe" Santa Clara County Office of Education (April 4)  
Public Lecture, "Life at the Edge: Life in Extreme Environments on Earth and the Search for Life in the Universe", Santa Barbara Museum of Science (March 24)  
Filmed, Morgan Freeman's Through the Wormhole, season 2, Mt. Baldy & LA (March 22)  
Darwin Day Lecture, "Why Darwin is critical to astrobiology", Stanford University (Feb 26)  
Science Lecture Series, "Darwin 101: from Earth to Space", Carlmont High School, Belmont, CA (Feb 16)  
Darwin Day, "Darwin 101: from Earth to Space", North Carolina Museum of Natural History, Raleigh (Feb 12)  
Public Lecture, "Defining the Envelope for the Search for Life in the Universe", San Mateo County Astronomical Society, College of San Mateo, San Mateo, CA (Feb 4)

### 2010

Lecture, AP Bio Classes, Carlmont High School, Belmont, CA (7 Dec)  
Filmed, BBC "Do We Really Need the Moon?", Death Valley (September 30)  
Public Lecture, Innovation in Space Discoveries: Is There Life Out There? Collin College, Plano, Texas (Sept. 29)  
Filmed, "Extra Terrestrials", Treasure Island, CA (June 10)  
Filmed, Morgan Freeman's Through the Wormhole, season 1, California Academy of Sciences, Botanical Gardens (March 23) (<http://science.discovery.com/tv-shows/through-the-wormhole>)  
See ~3-8 minutes in. Rothschild's clip is the fourth most viewed clip on the internet to date at

280,315 views as of May 30, 2013) <https://www.sciencechannel.com/tv-shows/through-the-wormhole/full-episodes/are-we-alone>

Keynote lecture, Evolutionpalooza, San Francisco (February 13)

Lecture, NASA Explorer School Teachers in Yellowstone (January 20)

## 2009

Lecture, Silicon Valley Astronomy Lecturer (11 Nov)

<http://www.astrosociety.org/education/podcast/index.html>

Lecture, 8th grade, Brunswick Middle School, Brunswick, Maine (9 November)

SETI Radio, Are we alone? (August

[http://radio.seti.org/episodes/Skeptic\\_Check\\_Doomsday\\_at\\_the\\_Movies](http://radio.seti.org/episodes/Skeptic_Check_Doomsday_at_the_Movies))

Filmed National Geographic "Space Traveler" episode, NASA Ames (23 July)

Filmed National Geographic "Unknown Universe" episode, Oakland Zoo (4 May)

Maine Space Day presenter (May 1)

Lecture, San Francisco Amateur Astronomers (March 18)

Lecture, NASA Explorer School Teachers in Yellowstone (January 21)

## 2008

Lecture to Ames Exploration Docents (Nov. 18, 2008)

Education and outreach lectures in diversity of schools and Lake Bogoria Visitors' Centre, Kenya (Oct )

Filmed Discovery Channel episode, "Life in the Solar System", NASA Ames and Rift Valley, Kenya (Sept-Oct 2008)

Filmed National Geographic "Naked Science" episode, "Venus", Yellowstone National Park, NASA, Stanford (August 2008) ([http://channel.nationalgeographic.com/series/naked-science/3897/Photos#tab-Videos/06795\\_00](http://channel.nationalgeographic.com/series/naked-science/3897/Photos#tab-Videos/06795_00))

Filmed National Geographic "Naked Science" episode, "The future of life", Cargill Salt Company and California Academy of Sciences (June-July 2008)

Filmed History Channel show, "The Universe: Alien Faces", Fitzgerald Marine Reserve, CA (June 11, 2008) <http://www.youtube.com/watch?v=B1RSZDtm8Zw>

KQED Public Radio, The California Report, Astrobiology (April 16, 2008)

<http://www.californiareport.org/archive/R804160833>

Lecturer, Adventure Series, Mystic Seaport, Mystic CT "Exploring the limits of life in the Universe" (March 20)

Lecture, NASA Explorer School Teachers in Yellowstone (January 11, 2008)

## 2007

Guest Lecture, "Astrobiology", UCSF (November 29)

Radio Interview, Stanford KZSU noon show. (October 29)

Filmed BBC Horizon show, "The hunt for a second earth", Bolivian altiplano and Atacama desert (July) (<http://www.bbc.co.uk/sn/tvradio/programmes/horizon/broadband/tx/alone/highlights/>)

Filmed National Geographic show, "Origin of Life", Bolivian altiplano and Atacama desert (June-July)

Lecture to ScienceCorps Teacher program, Maine (NSF), (June)

Filmed two segments for Comcast (CNN) in San Francisco studio (May)

Public lecture, Boston Aquarium, as part of Danish symposium on global change (April)

## 2006

Filmed for BBC show on Aliens, Stanford Theater (December 2006)

Filmed three segments for Comcast (CNN) in San Francisco studio (November 2006)

Lecture to 200+ high school students and teachers, Aarhus, Denmark (November 2006)  
Guest Lecture, "Astrobiology", UCSF (October 2006)  
Contributor to Roger Williams Park Museum exhibit on Astrobiology (fall, 2006)  
Guest on "KidsCorner", WXPB radio, Philadelphia (September 20)  
Presentation of Yellowstone outreach project, Space 2006, San Jose (September 20)  
Filmed two segments for Comcast (CNN) at de Young Museum, San Francisco (July 12)  
Lecture to ScienceCorps Teacher program, Maine (NSF), June 2007  
Filmed three segments for Comcast (CNN) in San Francisco studio  
Filmed for science syndicate at Exploratorium on finding new species (see Science Daily, 1 March 2006, [http://www.sciencedaily.com/videos/2006/0307-name\\_that\\_species.htm](http://www.sciencedaily.com/videos/2006/0307-name_that_species.htm))  
Public event at Exploratorium in SF on discovering new species

## 2005

Plenary lecture, Launching a Dream, Teacher Workshop, Kansas City  
Filmed for National Geographic special on the Moon, on location, Bar Harbor, Maine  
Filmed for Comcast (CNN) in San Francisco studio  
Lectured to ~20 NASA Explorer School Teachers  
Lecture, SETI Science Day, NASA Ames  
Interviewed on multipart series, Pulse of the Planet (NPR)  
Interviewed for National Geographic web site  
Hosted approximately 30 National Park Interpretive Staff in lab tour

## 2004

Filmed for "What we don't know", TV series with Martin Reese, Astronomer Royal (aired in UK, Dec. 2004)  
Ran 30 minute workshops for 40 National Park Interpretive Staff in "Earth to Sky" program (October)  
Filmed for Comcast (CNN) on USS Hornet, 35th anniversary of Apollo 11 (July 20)  
Panelist, "Women in Space Science", USS Hornet, Apollo 11 Anniversary celebration) (July 20)  
Filmings: New York Hall of Sciences (Extremophile exhibit); BBC4 (with Martin Rees, Astronomer Royal-initial airing in UK, 5 December 2004), German TV in Bolivia  
Organized and chaired outreach session, "Astrobiology and Humanity", NASA Ames (March 28)  
Interviewed on Eyewitness News, San Francisco, March 27, 2004  
Plenary lecturer for Skyline College, Women in Science Day (attended by over 1000) (March 20)

## 2003

Interviewed for SETI Radio, Are we alone? July (July)  
Space Science Update Press Conference, NASA HQ (February 19)  
Lecture, Crystal Springs Upland School (February)  
Public lecture, Penn State Erie, "A biologist's guide to the galaxy" (April)  
Interview, ASM radio for NPR (May)

## 2002

Santa Clara University. The Good (?) Old Days: Life in the Precambrian (June 4)  
Met with High School Students, Los Altos High School (April 30)  
Photographed for Photo by Volker Steger / Science Photo Library. (May)  
Interviewed on Canadian Broadcast Company, Quirks and Quarks (February 23)  
(<http://www.radio.cbc.ca/programs/quirks/archives/01-02/feb2302.htm>)

2001

Filmed for BBC TV for 'Cell City,' a popular science program, to air next year.  
Debater for Wonderfest 2001 (UC Berkeley) on "What is Life?"  
London Sunday Telegraph Magazine section, on Astrobiology by David Bennum (Oct. 14)  
Team leader, Yellowstone National Park/Astrobiology Institute Outreach effort  
Lecture to Sonoma County Astronomical Society (February)  
Dean Lecture, Astrobiology Series, California Academy of Science (March)  
Interview with NPR for DNA Files program on Astrobiology (February 2001, aired Nov. 2001). (Note:  
on May 20, 2002 The Robert Wood Johnson Foundation awarded The DNA Files and SoundVision  
Productions the RWJ Prize for Health and Medical Reporting.)  
Filmed for Discovery Show on Extrasolar Planets (April, Yellowstone)  
Organizer of Astrobiology Institute/Yellowstone National Park outreach program  
Advisor, New York Hall of Science (Extremophile Exhibit)  
Advisor, Denver Museum of Natural & Science (Space Odyssey Exhibit)

2000

Speaker for Mount Talmalpais Astronomy Lecture Series (October)  
Filmed for TV documentary on human space exploration (October) Shandra Productions  
Speaker for TTI/Vanguard Meeting (September)  
Lecture to staff, Yellowstone National Park (September)  
Speaker for Astrobiology lecture series, Evergreen College, San Jose (May)  
Filmed for TV documentary on the moon (Aug. 1999) York Television; aired December 1999, January  
2000, autumn 2000. Still in re-runs 2012  
Filmed for ABC World News Tonight with Peter Jennings on Extremophiles. Aired October 18, 2000.  
[http://more.abcnews.go.com/onair/worldnewstonight/wnt001018\\_yellowstone\\_feature.html](http://more.abcnews.go.com/onair/worldnewstonight/wnt001018_yellowstone_feature.html)

1999

Photographed for Stern Magazine  
Interview, Jack Cole Show, Palm Beach, Florida on Astrobiology (December)  
Filmed TV documentary, "If we had no moon" (Aug. 1999) York Television  
BioForum symposium speaker California Academy of Sciences for teacher training series, Oct 1998  
(<http://www.accessexcellence.org/BF/bf05/rothschild/bf05b2.html>)  
Invited banquet speaker for the SCATS (Schools and Colleges for Advancing the Teaching of Science)  
program (September 21)  
Spoke to k-8 on anniversary of Apollo 11 on the Apollo 11 mission and the moon in general (July)