Janet Louise Siefert

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**A. Education**

2022 – in prog. Northern Seminary, Masters of Art (Women in Theology)

1997 – Ph.D. University of Houston, Biology

1975 – B.S. University of Central Arkansas, General Science

**B. Professional Positions**

2020 – present Senior Research Fellow, Director of Communication, Lanier Theological Library, Houston Texas.

2009 – to present Associate Research Professor, Rice University, Dept. of Statistics

2011 – to present Adjunct Associate Professor, University of Houston, Dept. of

Biology and Biochemistry

2002 – 2009 Faculty Fellow, Rice University

2000 – 2002 NSF Postdoctoral Fellow Rice University w/M Kimmel

1998 – 2000 Keck Postdoctoral Fellow w/M Kimmel

**C. Selected Honors**

2022

2009 NAI’s Director Discretionary Award

2007 Rice President’s International Travel Fund Award

2004 NAI’s Discretionary Research Award

2004 NASA Education and Public Outreach Grant, $15K, Astrobiology

course in spring at Rice

1999 ISSOL '99 Travel Grant Award Recipient

1998 PostDoctoral Travel Award, Keystone Symposia, A2 Conference.

1998 NASA/LPI/USRA Scientist-Teacher Cooperation Grant

1996, 97 Graduate Student Challenge, lst place winner,

1996 UH NS&M Alumni Assoc-Outstanding Graduate Student

1994 Ruth Satter Memorial Merit Citation, Assoc. Women in Science

1994 Beohering Ingelheim Fonds Short Term Fellowship for study at the

Gesellschaft fur Biotechnologische Forschung, 1994

1971 ACT scholarship, undergraduate 4 yrs

**D. Synergistic Activities**

**(1) Reviewer for:** NSF, NASA, Nature, PNAS, J Molecular Evolution, Trends in Microbiology, J Theoretical Biology, Molecular Biology, Biology Direct – Editorial Board

**(2) Membership:** ISSOL, Virtual Planet Laboratory, Astrobiology, Penn State Astrobiology Research Center, Keck Center for Computational Biology, ASM, AGU

**(3) Government / Industry Service:** Convener 2023 Christian Scholar’s Conference, Lanier Learning Center, Co-convenor AbSciCon 2010, President ISSOL – 2009 – 2011, National Research Council COEL Panelist; Keck Center for Computational Biology, Faculty/Mentor 1999 – present; Houston Science Café 2004-2008, co-director; Gordon Research Conference, Origin of Life, Vice Chair/Chair Elect, 2004-2006; Gordon Keenan Graduate Research Conference on Origin of Life, 2006, Initiated and organized first ever for GRC OOL conference; SOC – Astrobiology 2008; SOC ISSOL, Science Café – co-director, 2004 – 2008; EANA Astrobiology Workshop, 10/2006; Bioastronomy 2007, Puerto Rico, Scientific Organizing Committee; Bioinformatics Symposium & Workshop, Guadalajara, Mexico, Speaker, 10/2003; Instructor - ESMTB School, Biology and Mathematics of Cells, Siquenza, Spain, 6/2001; NSF ISSOL Regional Representative, 2000-2002; Discussion leader, GRC Origin of Life 2000, 7/ 2000; Guest Lecturer and Organizer, Workshop on Molecular Evolution and Phylogenetic; Analysis, University of Mexico, Mexico City, 1997; Graduate Research Assistant - University of Houston, 1994-1997; Teaching Assistant -Summer Workshop on Molecular Evolution, Marine Biological Laboratories, 1995, '96; Maintained/operated DNA core synthesis facility-University of Houston, 1989-1993; Teaching Assistant - University of Houston, General Microbiology, Nursing Microbiology, and General Biology, 1989-1993

**E. Peer Review or refereed Publications**

Jordan G. Okie, Amisha T. Poret-Peterson, Zarraz M.P. Lee, Alexander Richter, Luis D.Alcaraz, Luis E. Eguiarte, Janet L. Siefert, Valeria Souza, Chris L. Dupont, James J. Elser (2019) Genomic adaptations in information processing underpin trophic strategy in a whole-ecosystem nutrient enrichment experiment bioRxiv 724484; doi: <https://doi.org/10.1101/724484>

Okie J., Poret-Peterson, A., Zarraz, L., Richter, A., Alcaraz, L., Eguiarte, L., Siefert, J., Souza, V., Dupont, C., and Elser J., Metagenomic signatures of microbial growth and trophic strategy in a whole-ecosystem nutrient enrichment experiment. In Review at ELife.

Siefert, JL, Gonzales, S, Larios-Sanz, M, Hill, P, Boddy, C, Lanier, M, and Ortiz, S. Soil Memory: Microbial Populations as Biosignatures for Evaluating Long Term Effects of Urbanization. In preparation.

M-P Lee, Z., Poret-Peterson, A.T., Siefert, J.L., Kaul, D., Moustafa, A., Allen, A.E., Dupont, C.L., Eguiarte, L.E., Souza,V., and Elser, J.J. (2017) Nutrient stoichiometry shapes microbial community structure in evaporitic shallow pond*. Frontiers in Micribiology* 8, 949

Siefert, J.L. (2012) Man and his spaceships: Vehicles for extraterrestrial colonization? *Mobile Genetic Elements* **2**, 6-12.

Siefert,J.L., Souza, V., Eguiarte, L. & Olmedo-Alvarez, G. (2012) Microbial Stowaways: Inimitable Survivors or Hopeless Pioneers? *Astrobiology* **12**, 710-715.

Souza,V., Eguiarte, L. E., Travisano, M., Elser, J. J., Rooks, C. & Siefert, J. L. (2012) Travel, Sex, and Food: What's Speciation Got to Do with It? *Astrobiology* **12**, 634-640.

Souza,V., Siefert, J. L., Escalante, A. E., Elser, J. J. & Eguiarte, L. E. (2012) The Cuatro Cienegas Basin in Coahuila, Mexico: An Astrobiological Precambrian Park. *Astrobiology* **12**, 641-647.

Nitti,A., Daniels, C. A., Siefert, J., Souza, V., Hollander, D. & Breitbart, M. (2012) Spatially Resolved Genomic, Stable Isotopic, and Lipid Analyses of a Modern Freshwater Microbialite from Cuatro Cienegas, Mexico. *Astrobiology* **12**, 685-698.

Siefert, JL, (2011) Astrobiology Pioneers: How a Real Housewife Became an Astrobiologist, *Astrobiology*, **11**, 193-195

Breitbart,M., Hoare,A., Nitti,A., Siefert,J., Haynes,M., Dinsdale,E., Edwards,R., Souza,V., Rohwer,F., & Hollander,D. (2009) Metagenomic and Stable Isotopic Analyses of Modern Freshwater Microbialites in Cuatro Ciénegas, Mexico. *Environmental Microbiology* **11**, 16-34.

Souza,V., Eguiarte,L.E., Siefert,J., & Elser,J.J. (2008) Microbial endemism: does phosphorus limitation enhance speciation? *Nat Rev Microbiol.* **6**, 559-564.

Alcaraz,L.D., Olmedo,G., Bonilla,G., Cerritos,R., Hernandez,G., Cruz,A., Ramirez,E., Putonti,C., Jimenez,B., Martinez,E., Lopez,V., Arvizu,J.L., Ayala,F., Razo,F., Caballero,J., Siefert,J., Eguiarte,L., Vielle,J.P., Martinez,O., Souza,V., Herrera-Estrella,A., & Herrera-Estrella,L. (2008) The genome of Bacillus coahuilensis reveals adaptations essential for survival in the relic of an ancient marine environment. *Proc. Natl. Acad. Sci. U. S. A.* **105**, 5803-5808.

Cerritos,R., Vinuesa,P., Eguiarte,L., Herrera,L., Alcaraz,L., Olmedo,G., Siefert,J., & Souza,V. (2008) *Bacillus coahuilensis* sp. nov. a new moderately halophilic species from different pozas in the Cuatro Ciénegas Valley in Coahuila, México. *IJSB*. **58**, 919-23.

Cerritos,R., Eguiarte,L., Avitia,M., Siefert,J., & Souza,V. (2008) High diversity of previously unknown cultivable species in an oasis of biodiversity in Cuatro Ciénegas, Coahuila, Mexico. *FEMS Microbiol Ecol.*

Desnues,C.M., Rodriguez-Brito,B., Rayhawk,S., Kelley,S., Tran,T., Haynes,M., Liu,H., Angly,F.E., Edwards,R.A., Thurber,R.V., Breitbart,M., Siefert,J.L., Souza,V., & Rohwer,F. (2008) Diversity and evolution of viruses in modern stromatolites and thrombolites. *Nature*. **452**, 340-343.

Kiang,N.Y., Siefert,J.L., Govindjee, & Blankenship,R.E. (2007) Spectral Signatures of Photosynthesis. I. A Review of Earth Organisms. *Astrobiology* **7**, 222-251.

Kiang,N.Y., Segura,A., Tinetti,G., Govindjee, Blankenship,R.E., Cohen,M., Siefert,J.L., Crisp,D., & Meadows,V.S. (2007) Spectral Signatures of Photosynthesis. II. Coevolution with Other Stars and the Atmosphere on Extrasolar Worlds. *Astrobiology* **7**, 252-274.

Kharecha,P.A., Kasting,J.F., & Siefert,J.L. (2005) A coupled atmosphere-ecosystem model of the early Archean Earth. *Geobiology* **3**, 53-76.

Raymond,J., Siefert,J.L., Staples,C.R., & Blankenship,R.E. (2004) The Natural History of Nitrogen Fixation. *Mol. Biol. Evol.* **21**, 541-554.

Martin,K.A., Siefert,J.L., Yerrapragada,S., Lu,Y., McNeill,T.Z., Moreno,P.A., Weinstock,G.M., Widger,W.R., & Fox,G.E. (2003) Cyanobacterial signature genes. *Photosynth. Res* **75**, 211-221.

Kharecha,P.A., Kasting,J.F., & Siefert,J.L. (2002) Predicting the biogenic methane concentration in the Archean atmosphere using numerical modeling. Astrobiology **4**, 528-529.

Kasting,J.F. & Siefert,J.L. (2002) Life and the evolution of Earth's atmosphere. *Science* **296**, 1066-1068.

Raymond,J., Blankenship,R.E., & Siefert,J.L. (2002) Horizontal gene transfer in the evolution of nitrogen fixation. Astrobiology **4**, 499.

Siefert,J.L. & Kasting,J.F. (2002 Evidence for an ancient operon of redox biochemistry. Astrobiology **4,** 441.

Kasting,J.F., Pavlov,A.A., & Siefert,J.L. (2001) A coupled ecosystem-climate model for predicting the methane concentration in the Archean atmosphere. *Orig. Life Evol Biosph.* **31**, 271-285.

Kasting,J.F. & Siefert,J.L. (2001) Biogeochemistry. The nitrogen fix. *Nature* **412**, 26-27.

Siefert,J.L., Larios-Sanz,M., Nakamura,L.K., Slepecky,R.A., Paul,J.H., Moore,E.R., Fox,G.E., & Jurtshuk,P., Jr. (2000) Phylogeny of marine Bacillus isolates from the Gulf of Mexico. *Curr. Microbiol.* **41**, 84-88.

Hedenstierna,K.O., Siefert,J.L., Fox,G.E., & Murgola,E.J. (2000) Co-conservation of rRNA tetraloop sequences and helix length suggests involvement of the tetraloops in higher-order interactions. *Biochimie* **82**, 221-227.

Siefert,J.L. & Fox,G.E. (1998) Phylogenetic mapping of bacterial morphology. *Microbiology* **144**, 2803-2808.

Siefert,J.L., Martin,K.A., Abdi,F., Widger,W.R., & Fox,G.E. (1997) Conserved gene clusters in bacterial genomes provide further support for the primacy of RNA. *J. Mol Evol* **45**, 467-472.

Pitulle,C., Yang,Y., Marchiani,M., Moore,E.R., Siefert,J.L., Aragno,M., Jurtshuk,P., Jr., & Fox,G.E. (1994) Phylogenetic position of the genus Hydrogenobacter. *Int. J. Syst. Bacteriol.* **44**, 620-626.

**F. Book Chapters and Books**

Bullivant S., Playford, R., and Siefert, J. *God and Astrobiology,* Elements Series, Cambridge University Press, in press.

Janet Siefert*, Science Explains Everything (True or Not True?)* Book chapter in Raising Children in a Scientific Age: Helping Children to Ask Better Questions about Science and Faith, editors Billingsley B., Canetta E., and Cullimore M., January, 2021.

Hoffmeier J., and Siefert J.L., *"Can We Believe in Creation and Evolution*"? Sending to publisher in late December.

Siefert,J.L. Defining the mobilome. *Methods Mol Biol.* **532**:13-27., 13-27 (2009).

Yerrapragada,S., Siefert,J.L. & Fox,G.E. Horizontal gene transfer in cyanobacterial signature genes. *Methods Mol Biol.* **532:339-66.**, 339-366 (2009).

The phylogeny of Bacterial Shape *in Molecules in time and space: Bacterial shape, division and phylogeny,* Siefert, J.L., Editor: Jesus Mingorance Cruz, published by Kluwer/Plenus, 2004.

**G. Genome or Metagenome Sequencing:**

3 Bacillus genomes are in the pipeline for geographical analysis with B. coahuilensis: Bacillus sp. PL-21; Bacillus sp. Mali 14; Bacillus vietnamensis NRRL B-14850

DOE- JGI Microorganisms and Chemical Processes Associated with Carbonate Biomineralization in Modern Freshwater Microbialites, June 2009

Fremyella diplosiphon UTEX481, member of annotation group with George Weinstock, Baylor.

*Bacillus* NRRL B 14911, Sequenced through the Moore Marine Foundation, 2004-2005.

Metagenome, viral and bacteria, for two microbialites from Cuatro Ciénegas, Mexico, in collaboration with Forest Rohwer, SDSU and Mya Breitbart, USF

**H. Community Service and Engagement**

Member of the NASA Astrobiology Institute’s Virtual Planet Laboratory, U. of Washington, Vikki Meadows, lead, 2009 – present <http://depts.washington.edu/naivpl/>

Hall of Reason, 2019, 2021, 2022, 2023. A series of science and faith presentations with discussion held at the Lanier Theological Library. Topics have included 2 sessions on the science of COVID, the Science of Sin, Hacks for Mental Health, The Evolution of Dogs and Why Scripture Disdains Them. Very well received by the community. <https://www.laniertheologicallibrary.org/events/hall-of-reason-at-the-ltl/>

Summer Shorties, 2022, 2023, a reading club of short stories meant to fuel faith with imagination and discussion. <https://www.laniertheologicallibrary.org/summer-shorties/>

Dabar Conference, the Creation Project, 2018, 2019, 2022 Invited Participant, Chicago, Illinois.

“Wisdom Wednesday” – a series of short, educational, entertaining multi-resourced videos in collaboration with Mark Lanier , focused on providing literacy to Christian scripture, accuracy in fact, and ethics. Hosted on YouTube https://www.youtube.com/playlist?list=PLRJZ8-ohk26uwLFTMcmByYVTz9wQlNJ5T

Member of the Religion and Civic Leaders ,in association with the Religion and Public Life Program, Rice University, directed by Dr. Elaine Ecklund.

Meeting at Memorial Women’s Club, Houston, TX “Are We Alone and Why Do We Care?” June, 2018

Science and Faith: a panel discussion, Lanier Theological Library, with Aljster McGrath, February 3, 2018, https://www.youtube.com/watch?v=EF7oSMpuYFc

University of Hull, Siefert, Janet "Cross Examined Series: Science, Faith and the Origin of Life - A Christian Astrobiologist gives her perspective". 30 November 2014. St John Newland Channel on YouTube. https://www.youtube.com/watch?v=Wv9Bs3B72uc

Meeting of the Willowbrook Rotarian, February 22, 2013, Guest Speaker, Title: Man and His Spaceships: Vehicles for Extraterrestrial Colonization. May 30, 2014, Cuatro Ciénegas: A Living Laboratory

Peckerwood Garden, Board of Directors, vice president, 2008 – 2010.

The Planetarium Experience at Cuatro Ciénegas- beginning in 2005, Siefert has collaborated with Carolyn Sumners, Houston Museum of Natural Science and Dr. Pat Reiff, Rice University, to create and distribute planetarium shows in English and Spanish. Siefert regularly takes the portable planetarium to Cuatro Ciénegas and surrounding communities in Mexico, where over 500 students and townspeople experience the full dome planetarium through viewing of at least two shows. Previous shows: Fantasy Worlds and Earth's Wild Ride. New shows are added annually.

Donation of used bicycles and computers for the Cuatro Ciénegas region, ongoing but to date over 30 bicycles and 60 computers have been brought to the local schools for distribution.

Astrobiology General Meeting 2002, Student Poster Judge 4/2002

Lead-Organizer of the 1999-2000 Houston Astrobiology Seminar Series, a schedule of scientific and community talks concerned with bringing science, astrobiology specifically, into the community.

NASA Teacher/Scientist Cooperative Grant. 12/1998. In collaboration with Westfield High School, Houston, TX, Ms. Leyla Morrison and 11th Grade English and Second Language Science Classes, Spring IDS.

Scientist Project Supervisor for the Science Engineering Fair of Houston, T.H. Rogers School, Houston I.S.D., 1997, 1998.

Speaker, Grades 3-5, Career Day, Houston ISD, 1995.

Volunteer-Advisory Board for Mercer Arboretum, Houston, Texas, 1980-1988

Due to the nature of the research and the necessity to keep bioinformatics data sets in the public, Siefert keeps extensive public and team-designated web pages. These can be viewed at http://www.stat.rice.edu/~siefert/Research/Evolutionindex.html

**I. Non-Technical Publications**

Science or Fact, a 4-part series, Science’s Quest to Answer Every Question. Katy Christian Magazine, editor Joseph Menslage, online. 2021

A Look Back in Time: Discovering the First Bacterium, J. L. Siefert. Focus on Microbiology Education, Spring 2000.

The Joining of Two Fossils, State Lines, Texas Magazine, Houston, Chronicle, 4/99

My Railroad Song, State Lines, Texas Magazine, Houston Chronicle, 6/96

Not So Common After All, State Lines, Texas Magazine, Houston Chronicle, 12/95

**J. Research in the News**

Discovery News, Have We Already Colonized Mars? Aug, 31, 2012, <http://news.discovery.com/space/we-may-have-already-colonized-mars-120831.html>

History Channel: How the Earth was Made: Birth of the Earth, premiered December,

2009

Discovery Channel, Catastrophe: Birth of a Planet ,premiered November 2008.

National Geographic, Naked Earth series: Our Atmosphere, debuted

April, 2008.

Sallyport, Winter 2007, Vol. 63, No. 2, *The Debate that Shouldn’t Happen* *and*

*Evolutionary Thinking,* by Deborah J. Aussman.

BBC, Radio 4, with Molly Bentley and online at   
 <http://www.bbc.co.uk/radio4/science/leadingedge_20070322.shtml>

Astrobiology Magazine, Stromatolites in Mexico, Analogues for Other Worlds, in January, 2007

New Scientist, Primeval life reflected in present-day pools, Karen Schmidt, July 2, 2005, Magazine issue 2006

Segnuda-feira, 06 de de 2006 no mimino Reportagem, Marina Lemle, 02.03.2006, **Sós,   
 mas por pouco tempo.** Radio report on the first Brazilian Astrobiology

Workshop.

Numerous interviews with Mexican media, broadcast in Mexico and on Spanish TV in Southwest US

Sallyport, Living Laboratory, Deborah Aussman, Summer 2005

American Museum of Natural History Special Exhibit, week of June 24th, 2005, **Cuatro Ciénegas: Ancient Microbes, Alien Life?**

**K. Collaborators** (past 4 years) G.E. Fox, (University of Houston), M. Travisano, (U of Minnesota), J.J. Elser (ASU), M. Deem (Rice University), F. Rohwer (SDSU), D. Hollander (USF), Mya Breitbart (USF)

**L. Graduate and Postdoctoral Advisors** Dr. Peter Jurtshuk Jr. (Doctoral), Dr. Marek Kimmel (Postdoc)

**M. ORAL AND POSTER PRESENTATIONS**

2022 IV Astrobiology School at Observatório Nacional, November 19 – 23, Invited Lecturer, The Philosophy, Biology, and Future of Astrobiology. (oral)

2021 Brazilian Astrobiology Conference, October 26, 2021.Invited keynote. Sociedade Brasileira de Astrobiologia, Space Explorers – The Future of Astrobiology" (oral)

2016 ASOR Annual Meeting, Nov. 16-19, 2016 San Antonio, TX. Soil Memory: Microbial Populations as Biosignatures for Evaluating Long Term Effects of Urbanization. Gonzales, S, Larios-Sanz, M, Siefert, JL, Hill, P, Boddy, C, Hartshorn, A, Lanier, M, and Ortiz, S. (poster)

2016 ASLO Summer Meeting, 5-10 June 2016, Santa Fe, New Mexico. Nutrients, Ribosomes, and Genomes: A Desert Survival Test for the Growth Rate Hypothesis.

Elser, JJ, Lee, Z, Poret-Peterson, A, Okie, J, Steger, L, Learned, J, Dupont, C, Siefert, JL, and Souza, V (invited oral)

2014 Joint Aquatic Sciences Meeting, Portland, Oregon, USA, May 2014.

Life on Floating Pumice. Elser, JJ Corman, JR, Lee, Z, Siefert, JL, Bastidas, M, Cuassolo, F, Laspoumaderes, C, Sol Souza, M, Modenutti, B, and Balseiro, E. (oral)

2012 Astrobiology Science Conference 2012, April 15-20, 2012, Atlanta, GA. Life on Floating Pumice. Elser, JJ, Lee, Z, Corman, J, Siefert, JL, Bastidas, M, Cuassolo, F, Laspoumaderes, C, Souza, M, Modenutti, B, and Balseiro, E. (poster)

2013 Princeton Center For Theoretical Science Origin of Life 21-24 January 2013, Princeton, Massachusetts, Phylogeny of cell shape: A window into origins or adaptive dead end? Siefert, JL (oral presentiation)

2012 ASLO Aquatic Sciences Meeting, 8-13 July 2012, Lake Biwa, Otsu, Shiga, Japan. What Could a Whole Earth Stromatolite Catalogue Tell Us? Siefert, JL, Souza, V., Eguiarte, L., and Meadows, V. (oral presentation)

2012 ASLO Aquatic Sciences Meeting, 8-13 July 2012 in Lake Biwa, Otsu, Shiga, Japan. Life on Floating Pumice, Elser, JJ, Corman, JR, Lee, Z.,Siefert, JL, Bastidas, M, Cuassolo, F., Laspoumaderes, C., Souza, MS, Balserio, EG, Modenutti, BE. (oral presentation)

2011 Souza, V., J. Siefert, J.J. Elser, and L. Eguiarte. 2011. “The Cuatro Ciénegas Bolson in Coahuila, Mexico: an astrobiological Precambrian park,” Origins 2011, conference of the International Society for the Study of the Origin of Life and Astrobiology Society (poster), Montpelier, France.

2011 The III International conference Biosphere Origin and Evolution, Crete, Greece, October 16-20, 201 Cuatro Ciénegas: a Precambrian Astrobiology Park. Siefert, JL

2011 The First International Earth Microbiome Project Conference, Shenzhen, China, June 13-15, 2011. What Could a ‘Whole Earth Stromatolite Catalogue’ Tell Us? (oral presentation)

1. 2011 Workshop and Fieldtrip: Geobiology in Space Exploration, Feb 7 – 14, 2011, Marrakesh Morocco. Cuatro Cienegas: A Precambrian Park. Siefert, JL. (oral presentation)

2010 VBC-PhD-Symposium 2010, Origin of Life, Vienna, Austria. November 18-19, 2010. Keynote speaker, Microbial Evolution

2009 Montana State University, Thermal Biology Institute, November

16, 2009, Cuatro Ciénegas, a desert oasis: what can it tell us about microbial evolution? Seminar speaker

2009 University of Alaska, Emergence of Chemical Systems Symposium, June 22-26, 2009, Building a Genome: From the RNA World to Now. Invited Speaker

2009 Space Telescope Science Institute, May 4-7, 2009, LUCA (Last Universal Cellular Ancestor) and the 3 Domains of Life. Invited speaker