Morgan S. Sobol, Ph.D. **July 2026**
Assistant Professor - Texas State University

Department of Biology
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Education

2019-2022	**Ph.D. in Microbiology** (Advisor: Prof. Dr. Anne-Kristin Kaster) Karlsruhe Institute of Technology
2016-2018	**M.S. in Marine Biology** (Advisor: Dr. Brandi Kiel Reese) Texas A&M University-Corpus Christi
2013-2016	**B.S. Biology**, minor in Chemistry Texas A&M University-Corpus Christi

Appointments

January 2025-present	**Assistant Professor,** Department of Biology, Texas State University
May 2023 - Dec. 2024	**NASA Astrobiology Program Postdoctoral Fellow**, Kaçar Lab, University of Wisconsin-Madison
Feb. 2023 - Dec. 2024	**Postdoctoral Scholar**, Kaçar Lab, University of Wisconsin-Madison
Feb. 2019 - Dec. 2022	**Research Scientist**, IBG-5, Karlsruhe Institute of Technology
Fall 2018	**Research Scientist**, Reese Geomicrobiology Lab, Texas A&M University – Corpus Christi
Fall 2017	**Microbial Ecology & Microbiology 2421 Teaching Assistant**, Texas A&M University – Corpus Christi
Fall 2016	**Microbial Ecology & Anatomy and Physiology II Teaching Assistant**, Texas A&M University – Corpus Christi
Aug. 2016 - Aug. 2018	**Graduate Research Assistant,** Reese Geomicrobiology Lab, Texas A&M University – Corpus Christi
Feb. 2015 - Aug. 2016	**Undergraduate Research Assistant**, Reese Geomicrobiology Lab, Texas A&M University – Corpus Christi
Aug. 2014 - May 2015	**Biology 1406-1407 & Microbiology 2421 Supplemental Instructor**, Texas A&M University – Corpus Christi
Summer 2014	**IM-SURE Research Intern**, Miller Microbial Evolution Lab, University of Montana

Peer-reviewed Publications

Publications: 17; Citations: 309 (Since 2021: 283); H-index: 10; i10-index: 10 (Google Scholar)
**denotes co-first author; *denotes equal contribution; ! denotes Sobol Lab mentees
Link to Google Scholar

17. Klos, A. S., **Sobol, M. S**., Boden, J. S., Stüeken, E. E., Anderson, R. E., Konhauser, K. O., & Kaçar, B. (2026). Biological use of molybdenum and tungsten stems back to 3.4 billion years ago. Nature Communications, 17(1). https://doi.org/10.1038/s41467-026-72133-0

16. Sobol, M. S., & Martinez-Gutierrez, C. A. (2026). Tracing ancient life through the genomic record. Journal of Applied Microbiology, 137(3). https://doi.org/10.1093/jambio/lxag056

15. Sobol, M. S., Klos, A. S., Ané, C., McMahon, K. D., & Kaçar, B. (2026). Ecological constraints and evolutionary trade-offs shape nitrogen fixation across habitats. ISME Communications, 6(1), ycag007. https://doi.org/10.1093/ismeco/ycag007

14. Jones C.L.C.*, Camps-Castella J.*, Smykala M.*, **Sobol M.S.*** & Inomura K.* (2024). Seeing through the gray box: an integrated approach to physiological modeling of phytoplankton stoichiometry. Front. Ecol. Evol. 12:1505025.

13. El Khaled El Faraj, R., Chakraborty, S., Zhou, M., **Sobol, M.S**, Thiele, D., Shatford-Adams, L. M., Correa Cassal, M., Kaster, A.K., Dietrich, S., Levkin, P. A., & Popova, A. A. (2024). Drug-Induced Differential Gene Expression Analysis on Nanoliter Droplet Microarrays: Enabling Tool for Functional Precision Oncology. Adv. Healthc. Mater. 2024, e2401820.

12. Hembach, N., Drechsel, V., **Sobol, M.S.**, Kaster, A.K., Köhler, H-R., Treibskorn, R., & Schwartz, T. (2024). Effect of glyphosate, its metabolite AMPA, and the glyphosate formulation Roundup ® on brown trout (*Salmo trutta* f. fario) gut microbiome diversity. *Frontiers in microbiology*, *14*, 1271983.

11. Wiegand, S., **Sobol, M.S.**, Schnepp-Pesch, L.K., Yan, G., Iqbal, S., Vollmers, J., Müller, J.A. & Kaster, A.K. (2023). Taxonomic Re-Classification and Expansion of the Phylum Chloroflexota Based on over 5000 Genomes and Metagenome-Assembled Genomes. *Microorganisms*, *11*(10), p.2612.

10. Rivier, A.J., Myers, K.S., Garcia, A.K., **Sobol, M.S.**, & Kaçar, B. (2023). Regulatory response to a hybrid ancestral nitrogenase in *Azotobacter vinelandii*. *Microbiol. Spectr.* e02815-23.

9. Zoheir, A.E., **Sobol, M.S.**, Ordonez, D., Kaster, A.K., Niemeyer, C.M., & Rabe, K.S. (2023). A three-colour stress biosensor reveals multimodal response in single cells and spatiotemporal dynamics of biofilms. *NPJ Biofilm Microbiomes*. 9(1).

8. Münch, J.M., **Sobol, M.S.**, Brors, B., & Kaster, A.K. (2023). Single-cell transcriptomics and data analyses for Prokaryotes– Past, present, and future concepts. *Adv. Appl .Microbiol.* Vol. 123, 1-39.

7. Sobol, M. S., Hoshino, T., Futagami, T., Kadooka, C., Inagaki, F. & Reese, B. K. (2023). Genome characterization of two novel deep-sea sediment fungi, *Penicillium pacificagyrus* sp. nov. and *Penicillium pacificasedimenti* sp. nov., from South Pacific Gyre subsurface sediments, highlights survivability. *BMC Genomics*. 24(1), 1-17.

6. Sobol, M. S. & Kaster, A.K. (2023). Back to the basics: A simplified improvement to multiple displacement amplification for microbial single-cell genomics. *Int. J. Mol. Sci.* 24, 4270.

5. Kiel Reese, B., **Sobol, M. S**.**, Bowles, M. W. & Hinrichs, K.-U. (2021). Redefining the Subsurface Biosphere: Characterization of Fungi Isolated From Energy-Limited Marine Deep Subsurface Sediment. *Front. Fungal Biol.* 0, 49.

4. Kaster, A. K. & **Sobol, M. S.**** (2020). Microbial single-cell omics: the crux of the matter. *Appl. Microbiol. Biotechnol.* 104, 8209–8220.

3. Dam, H. T., Vollmers, J., **Sobol, M. S.**, Cabezas, A. & Kaster, A.-K. (2020). Targeted Cell Sorting Combined With Single Cell Genomics Captures Low Abundant Microbial Dark Matter With Higher Sensitivity Than Metagenomics. *Front. Microbiol.* 11, 1377.

2. Sobol, M. S., Hoshino, T., Futagami, T., Inagaki, F. & Reese, B. K. (2019). Draft genome sequences of *Penicillium* spp. from deeply buried oligotrophic marine sediments. *Microbiol. Resour. Announc.* 8.

1. Reese, B. K., Zinke, L. A., **Sobol, M. S.**, LaRowe, D. E., Orcutt, B. N., Zhang, X., Jaekel, U., Wang, F., Dittmar, T., Defforey, D., Tully, B., Paytan, A., Sylvan, J. B., Amend, J. P., Edwards, K. J. & Girguis, P. (2018). Nitrogen Cycling of Active Bacteria within Oligotrophic Sediment of the Mid-Atlantic Ridge Flank. *Geomicrobiol. J.* 35.

In Prep, In Review or Non-peer-reviewed Publications

Sobol, M.S., Rucker, H. R., Libby, E., Kaçar, B., & Anbar, A. D. (2025). Ecological resource competition as a driver of metallome evolution. *bioRxiv* (In review)

Buessecker, S., Klos, A., Quan, M.E., Finch, A., **Sobol, M.S**., Evans, G.N., Anbar, A. D., Kaçar, B., & Dekas, A.E. (2025) Microbial N2O reduction in sulfidic waters: Implications for Proterozoic oceans. *bioRxiv* (In review)

Münch, J.*, **Sobol, M.S.***, Brors, B., & Kaster, A,K. (*In prep*). A microbial single-cell RNA-sequencing approach for environmental samples.

Sobol, M.S., Sturm, G., & Kaster, A.K. (2024). Besser und günstiger: Volumenreduktion in der Einzelzellgenomik. *BIOspektrum 30*(1).

Sobol, M. S. & Kaster, A.K. (2021). Gezielte Zellsortierung in der Einzelzellgenomik. *BIOspektrum* 273 27, 274–276.

Fellowships and Awards

May 2023-Dec 2024	NASA Postdoctoral Fellowship Award ($80,000/yr)
July 2022	Biointerfaces International Graduate School 1st Place Oral Presentation
December 2021	Karlsruhe House of Young Scientists Networking Grant (€1500)
March 2020	Biointerfaces International Graduate School Travel Grant Award (€1000)
May 2019	Deep Carbon Observatory Deep Life Community Travel Support Award ($1200)
December 2017	TAMUCC Parent's Council Travel Award ($1000)
October 2017	Ruth A. Campbell Endowed Scholarship ($1100)
September 2017	MARB Student Travel Award ($1500)
May 2017	TAMUCC Parent's Council Travel Award ($1000)
2016-2017	TAMUCC College of Science and Engineering Graduate Scholarship ($1000)
October 2015	Pathways Overall Second Place Undergraduate Poster Presentation
October 2015	Pathways 1st Place Undergraduate Life Sciences Poster Presentation
Summer 2015	LSAMP Undergraduate Research Award
2015 - 2016	Killebrew Scholarship Fund
2015 - 2016	Rising Scholar Scholarship
2014 - 2016	Marty Pritchett Scholarship Endowment
2013 - 2016	Texas A&M University – Corpus Christi Academic Achievement Scholarship ($10,000)

Invited Talks

January 2026	Invited Speaker, UTSA – South Texas Center for Emerging Infectious Diseases Seminar Series
January 2026	Invited Speaker, University of California – Santa Barbara Earth Sciences Seminar Series
October 2023	Invited Speaker, NASA LIFE RCN Nitrogen Cycle Workshop 2023. Online.
September 2023	Invited Presentation, KB Raper Symposium 2023. Madison, WI, USA.
July 2023	Invited Presentation, Goldschmidt 2023. Lyon France.

Presentations

July 2026	**Morgan Sobol**, Holly Rucker, Eric Libby, Ariel Anbar, Betül Kacar. Evolutionary origins and ecological implications of alternative nitrogenases. ESA 2026, Salt Lake City, UT, USA.
June 2024	**Morgan Sobol**, Amanda K. Garcia, Cecilé Ané, Betül Kaçar. Ecological and environmental dynamics in nitrogen fixation evolution. ASLO 2024, Madison, WI, USA.
July 2022	**Morgan Sobol,** Julia Münch, Benedikt Brors, Anne-Kristin Kaster. Improving single-cell RNA-seq for microorganisms. BIF-IGS Annual Retreat, Karlsruhe Institute of Technology. Eggenstein-Leopoldshafen, DE.

April 2021	**Morgan Sobol**, Anne Popova, Shraddha Chakraborty, Pavel Levkin, Anne-Kristin Kaster. Improving Multiple Displacement Amplification for Single-Cell Sequencing with Droplet Microarrays. CellME Tech Day Online: Single Cell Analysis.
March 2021	**Morgan Sobol**, Anne Popova, Shraddha Chakraborty, Pavel Levkin, Anne-Kristin Kaster. Improving Multiple Displacement Amplification for Single-Cell Sequencing with Droplet Microarrays. Virtual 4th Revolutionizing Next-Generation Sequencing Conference.
September 2019	**Morgan Sobol**, Hang Dam, John Vollmers, Angela Cabezas, Anne-Kristin Kaster. Targeted cell sorting combined with single cell genomics reveals novel Chloroflexi species. 4th Microbial Single Cell Genomics Workshop, Boothbay harbor, Maine, USA.
November 2018	**Morgan Sobol**, Tatsuhiko Hoshino, Fumio Inagaki, Brandi Kiel Reese. Analysis of two *Penicillium* genomes from the oligotrophic marine subsurface. Texas ASM Branch Meeting, Corpus Christi, Texas, USA.
June 2017	**Morgan Sobol,** Mayra Rodriquez, Tatsuhiko Hoshino, Fumio Inagaki, Brandi Kiel Reese. Characterization of Deep Marine Subsurface Fungi from South Pacific Gyre Sediments. AbGradCon 2017, Charlottesville, Virginia, USA.
March 2017	**Morgan Sobol,** Mayra Rodriquez, Tatsuhiko Hoshino, Fumio Inagaki, Brandi Kiel Reese. Growth Characteristics of Fungi from Oligotrophic Marine Deep Subsurface. Texas ASM Branch Meeting, New Braunfels, Texas, USA.
January 2017	**Morgan Sobol**, Mayra Rodriquez, Brandi Kiel Reese. Characterization of Deep Marine Subsurface Fungi from South Pacific Gyre Sediments. MARB Annual Retreat. Texas A&M University – Galveston, Galveston, Texas, USA.
December 2016	**Morgan Sobol**, Mayra Rodriquez, Brandi Kiel Reese. Characterization of Deep Marine Subsurface Fungi from South Pacific Gyre Sediments. 6th Annual MSGSO Student Research Symposium, Texas A&M University-Corpus Christi. Corpus Christi, Texas, USA.
December 2015	**Morgan Sobol**, Laura Zinke, Brandi Kiel Reese. Investigating the Differences in the Total and Active Community Structure of mid-Atlantic Ridge Sediment. 5th Annual MSGSO Student Research Symposium, Texas A&M University-Corpus Christi. Corpus Christi, Texas, USA.

Poster Presentations

May 2026	**Morgan Sobol**, Holly Rucker, Eric Libby, Ariel Anbar, Betül Kaçar. Competition for metal cofactors as a driver of metalloenzyme evolution. AbSciCon2026, Madison, WI, USA.
January 2026	Brittney Moser#, Ulises Rodríguez-Cruz#, Cirilo J Martinez-Diaz#, **Morgan Sobol**. Unraveling ecological constraints and opportunities in enzyme family evolution. Geobiology GRC, Ventura, CA, USA.
July 2025	**Morgan Sobol**, Cecilé Ané, Katherine D. McMahon, Betül Kaçar. Opportunities and constraints that have shaped the evolution of nitrogen fixation. AEM GRC, Mount Holyoke, MA, USA.
May 2024	**Morgan Sobol**, Amanda K. Garcia, Cecilé Ané, Betül Kaçar. Evolutionary and ecological diversity of nitrogen fixation. AbSciCon 2024, Providence, RI, USA.

January 2024	**Morgan Sobol**, Amanda K. Garcia, Cecilé Ané, Betül Kaçar. Evolutionary and ecological diversity of nitrogen fixation. Geobiology GRS/GRC 2024. Galveston, TX, USA.
September 2023	**Morgan Sobol**, Amanda K. Garcia, Cecilé Ané, Betül Kaçar. A catalog of N_2-fixation gene diversity and its drivers today. KB Raper Symposium 2023. Madison, WI, USA.
April 2022	**Morgan Sobol**, Anne Popova, Shraddha Chakraborty, Pavel Levkin, Anne-Kristin Kaster. Improving Multiple Displacement Amplification for Single-Cell Sequencing with Droplet Microarrays. Integrated multi-omic analyses of microbial communities EMBO workshop, Luxembourg, LU.
February 2022	**Morgan Sobol**, Anne Popova, Shraddha Chakraborty, Pavel Levkin, Anne-Kristin Kaster. Improving Multiple Displacement Amplification for Single-Cell Sequencing with Droplet Microarrays. VAAMS 2022, Online, DE.
July 2021	**Morgan Sobol**, Anne Popova, Shraddha Chakraborty, Pavel Levkin, Anne-Kristin Kaster. Improving Multiple Displacement Amplification for Single-Cell Sequencing with Droplet Microarrays. BIF-IGS Annual Retreat, Karlsruhe Institute of Technology. Eggenstein-Leopoldshafen, DE.
February 2016	**Morgan Sobol**, Laura Zinke, Doug E. LaRowe, XinXu Zhanhe, Ulrike Jaekel, Fengping Wang, Beth N. Orcutt, Thorsten Dittmar, Heath J.Mills, Jan P. Amend, Katrina J. Edwards, Peter Girguis, Brandi Kiel Reese. Investigating the Differences in the Total and Active Community Structure of mid-Atlantic Ridge Sediment. ASLO 2016, New Orleans, Louisiana, USA.
October 2015	**Morgan Sobol**, Laura Zinke, Brandi Kiel Reese. Investigating the Differences in the Total and Active Community Structure of mid-Atlantic Ridge Sediment. 12th Annual Pathways Student Research Symposium, Texas A&M University-Corpus Christi. Corpus Christi, Texas, USA.
July 2014	**Morgan Sobol**, Emiko Sano, Scott Miller. Investigating functional divergence of *recA* paralogs from *Acaryochloris marina* in *Escherichia coli*. OREOS Undergraduate Research Symposium, University of Montana, Missoula, Montana, USA.

Teaching

Spring 2026	Instructor, **Microbial Ecology**, Texas State University
Fall 2025	Instructor, **Microbial Genomics**, Texas State University
Spring 2024	Guest lecturer, **Intro to Astrobiology**, Oberlin College
Spring 2024	Co-lecturer, **Planetary Microbiology**, University of Wisconsin - Madison
Spring 2023	Guest lecturer, **Planetary Microbiology**, University of Wisconsin - Madison
2020-2022	Teaching Assistant, **BAO4 Microbiology, F3, and F2 practical courses**, Karlsruhe Institute of Technology
Spring 2017	Teaching Assistant, **Microbial Ecology** & **Microbiology 2421**, Texas A&M University – Corpus Christi
Fall 2016	Teaching Assistant, **Microbial Ecology** & **Anatomy and Physiology II**, Texas A&M University – Corpus Christi

Mentorship

Postdoc:

Ulises E. Rodríguez-Cruz (TXST, 2025-Present)

PhD:

Amber Busboom (TXST, 2025-Present)

Master:

Isobel Buffum-Robbins (TXST 2026-), Brittney Moser (TXST, 2025-Present), Dominik Hellman (KIT, 2021), Inge Kleyboldt (KIT, 2020)

Postbaccalaureate:

Aya Klos (UW-Madison, 2023-2024)

Undergraduate:

Noémie Clemenceau (TXST, 2025-present), Cirilo Martinez Diaz (TXST, 2025-Present), Alyssa Trevino (TXST, 2025), Callan Lapinskas (UW-Madison, 2024), Mila Matney (UW-Madison, Summer 2023), Gabriela Faulstich (KIT, 2020-2022), Felix Metze (KIT, 2020), Christain Klemm (KIT, 2019), Robin Gräßer (KIT, 2019), Jannick Fuchs (KIT, 2019), Victor Delgado (TAMU-CC, 2018), Reesen Caster (TAMU-CC, 2017-2018), Mayra Rodriguez Gomez (TAMU-CC, 2016-2017)

Dissertation/Thesis Committee Membership

PhD:

Sabina Prajapati (TXST, 2025-Present, Advisors: Susan Schwinning & Jason Martina)

Master:

Ian Smith (TXST, 2025-Present, Advisors: Ryan Peterson & Manish Kumar)

Conference Organization

AbSciCon 2026 – "Transition Metals in Habitability and Biological Evolution", Convener with K. Rico, G. Evans, H. Rucker, & E. Edmans.

AbSciCon 2024 – "The natural selection of life's chemical elements: From environmental availability to biological function, on Earth and beyond", Primary Convener with A.K Garcia, K. Rico, G. Evans & B. Cuevas-Zuviria.

ASLO 2024 – "Exploring nitrogen fixation along the freshwater-marine continuum; A joint ASLO-SFS endeavor", Co-organizer with J.T. Scott, R. Book, & R. Fulweiler.

BIF-IGS 2021 Symposium – Karlsruhe Institute of Technology, Co-organizer.

Service Activities

Institutional

2026	Sally Ann Karnau Biology Scholarship Review Committee member; Search Committee Member for A&P and Microbiology Faculty of Instruction (Chair: Hugo Pedrozo)
2025	Panel Chair, Fall 2025 Honors College Undergraduate Research Conference
2025	Search Committee Member, Biology Research Program Faculty (Chair: Peggy Biga)

Professional

Collaborative Networks

2025-Present	Working Group 3 Member, NSF RCN – Nitrogen Fixation Across Aquascapes
2023-Present	Member, NASA ICAR – Metal Utilization and Selection Across Eons (MUSE)

Grant Proposal Reviewer

2026	NSG GRFP Reviewer

2025 NSF DEB-EP Ad Hoc Reviewer

2024 NASA RIA Write-In Reviewer, NASA RIA Executive Secretary, NSF DEB-EP Ad Hoc Reviewer

Journal Reviewer

2025 Communications Biology, Astrobiology, Biotechnology Advances, ASM mBio

2024 International Society for Microbial Ecology, ASM Applied and Environmental Microbiology

2023 Frontiers in Microbiology-Extreme Microbiology

Professional Development

2025 CIMER GradMENTOR Workshop, Texas State University, USA

2024 COMPASS Leadership and Management Training and Mentoring Program, Online

Society Memberships

2024-Present Origin of Life Early-career Network (OoLEN), Scientific Society for Astrobiology (SSA)

Community

2023-present Skype-a-Scientist

2017 Texas State Aquarium Teen STEM Cafe

2017 2017 Coastal Bend Regional Science Fair Judge

2013 - 2016 Texas State Aquarium Diver, Corpus Christi, Texas