

Curriculum Vitae
Prof. William D. Orsi
Professor of Geomicrobiology
Department of Earth and Environmental Sciences
Ludwig-Maximilians-Universität München
Munich, Germany 80333
+49 152 723 6770, w.orsi@lrz.uni-muenchen.de

University website: <https://www.en.palaeontologie.geowissenschaften.uni-muenchen.de/personen/professuren/orsi/index.html>

Lab website: www.orsigeomicrobiologylab.com

Positions

2020-Present	Associate Professor (with Tenure) of Geomicrobiology, Department of Earth and Environmental Sciences, Paleontology and Geobiology, Ludwig-Maximilians-Universität (LMU) München
2016-2020	Associate Professor (Tenure Track) of Geomicrobiology, Department of Earth and Environmental Sciences, Paleontology and Geobiology, Ludwig-Maximilians-Universität (LMU) München
2014-2015	Postdoctoral Investigator, Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution (WHOI)
2013-2014	Assistant Research Scientist, Horn Point Laboratory, University of Maryland Center for Environmental Sciences (UMCES)
2011-2013	Postdoctoral Fellow, Department of Geology and Geophysics, Woods Hole Oceanographic Institution (WHOI)

Education

2006-2011	Ph.D. in Biology, Northeastern University
2002-2006	B.S. in Biology, Temple University

Research Interests

- ☐ *Carbon cycling and storage*: Microbial carbon use efficiency and trace greenhouse gas cycling
- ☐ *Geomicrobiology*: Anaerobic microbiology, benthic microbial ecology, deep biosphere
- ☐ *Molecular microbial ecology*: Linking microbial diversity to subsurface carbon storage

Publications (*corresponding author)

H-index (September, 2025): 41 (Google Scholar), 37 (Web of Science), 42 (ResearchGate)

Helmbrecht V, Reichelt R, Grohmann D, **Orsi W*** (2025) Simulated early Earth geochemistry fuels a hydrogen-dependent primordial metabolism. *Nature Ecology and Evolution* 9, 769-778.

Stuehrenberg J, Kitzinger K, von Arx J, Graf J, Lavik G, Littmann S, Milucka J, **Orsi W**, Schorn S, Speth D, Vuillemin A, Wu S, Marchant H, Kuypers M (2025) Urea use drives niche separation between dominant marine ammonia oxidizing archaea. *Nature Communications* (accepted, in press).

Fierer, N Leung PM, Lappan R, Eisenhofer R, Ricci F, Holland SI, Dragone N, Blackall LL, Dong X, Dorador C, Ferrari BC, Goordial J, Holmes SP, Inagaki F, Korem R, Li SS, Makhalanyane TP, Metcalf JL, Nagarajan N, **Orsi W**, Shanahan ER, Walker A, Weyrich L, Gilbert J, Willis A, Callahan B, Shade A, Parkhill J, Banfield J & Greening C (2025) Guidelines for preventing and reporting contamination in low-biomass microbiome studies. *Nature Microbiology* 10, 1570–1580.

Coskun OK, **Orsi W**, D'Hondt, Gomez-Saez GV (2025) Identifying the active microbes driving organosulfur cycling from taurine and methionine in marine sediment. *ISME Communications* 5, ycaf033

Mills DB, Vuillemin A, Muschler K, Coskun Ö, **Orsi W*** (2025) The rise of algae promoted eukaryote predation in the Neoproterozoic benthos. *Science Advances* 11, eadt2147

Trejos-Espeleta JC, Marin-Jaramillo JP, Schmidt SK, Sommers P, Bradley JA, **Orsi W*** (2024) Principal role of fungi in soil carbon stabilization during early pedogenesis in the high Arctic. *PNAS* 121 (28) e2402689121.

Coskun OK, Gomez-Saez GV, Beren M, Özcan D, Günay SD, Elkin V, Hoşgörmez H, Einsiedl F, Eisenreich W, **Orsi W*** (2024) Quantifying genome-specific carbon fixation in a 750-meter deep subsurface hydrothermal microbial community. *FEMS Microbiology Ecology* 100(5): fiae062.

Helmbrecht V, Weingart M, Klein F, Braun D, **Orsi W*** (2023) White and green rust chimneys accumulate RNA in a ferruginous chemical garden. *Geobiology* 21: 758-769.

Weingart M, Chen S, Donat C, Helmbrecht V, **Orsi W**, Braun D, Alim K (2023) Alkaline vents recreated in two dimensions to study pH gradients, precipitation morphology, and molecular accumulation. *Science Advances* 9: eadi1884.

Coskun OK, Gomez-Saez GV, Beren M, Ozcan D, Hosgormez H, Einsiedl F, **Orsi W*** (2023) Carbon metabolism and biogeography of candidate phylum “Candidatus Bipolaricaulota” in geothermal environments of Biga Peninsula, Turkey. *Frontiers in Extreme Microbiology* 14: 1063139.

Mincer TJ, Bos ER, Zettler ER, Zhao S, Asbun AA, **Orsi W**, Guzzetta VS, Amaral-Zettler LA (2023) Sargasso Sea *Vibrio* bacteria: Underexplored potential pathogens in a perturbed habitat. *Water Research* 242: 120033.

Orsi W* (2023) A rapid method for measuring ATP+ADP+AMP in marine sediment. *Environmental Microbiology* 2: 1549-1558.

Orsi W and Inagaki F (2023) Decoding geobiological evolution from microbiomes. *Science Advances* 9: eadg5448.

Orsi W* (2022) Quantitative microbial ecology: future challenges and opportunities. *Environmental Microbiology* 25: 91-96.

Vuillemin A, Coskun OK, **Orsi W** (2022) Microbial activities and selection from surface ocean to seafloor on the Namibian continental shelf. *Applied and Environmental Microbiology* 10: e0021622.

Vargas S, Leiva L, Eitel M, Curdt F, Rohde S, Arnold C, Nickel M, Schupp P, **Orsi W**, Adamska M, Wörheide G (2022) Body-plan reorganization in a sponge correlates with microbiome change. *Molecular Biology and Evolution* 40: msad138.

Michaelis T, Wunderlich A, Coskun OK, **Orsi W**, Baumann T, Einsiedl F (2022) High resolution vertical biogeochemical profiles in the hyporheic zone reveal insights into microbial methane cycling. *Biogeosciences* 19: 4551-4569.

Orsi W*, Vuillemin, Coskun OK, Rodriguez P, Oertel Y, Niggemann J, Mohrholz V, Gomes-Saez G (2022) Carbon assimilating fungi from surface ocean to seafloor revealed by coupled phylogenetic and stable isotope analysis. *The ISME Journal* 16: 1245-1261.

Coskun OK, Vuillemin A, Schubotz F, Klein F, Sichel SE, Eisenreich W, **Orsi W*** (2022) Quantifying the effects of hydrogen on carbon assimilation in a seafloor microbial community associated with ultramafic rocks. *The ISME Journal* 16: 257-271.

Orsi W*, Magritsch T, Vargas S, Coskun OK, Vuillemin A, Höhna S, Wörheide G, D'Hondt S, Shapiro J, Carini P (2021) Genome evolution in clonal bacterial populations isolated from million-year-old seafloor sediment. *mBio* 12: e01150-21.

Garber AI, Ramirez GA, McAllister SM, **Orsi W**, D'Hondt S (2021) Cryptic metabolisms in anoxic seafloor sediment. *Environmental Microbiology Reports* 13: 696-701.

Puzenat V, Escartin J, Martel JE, Barreyre T, Le Moine S, Paraskevi N, Gracias N, Allemand P, Antoniou V, Coskun O, Garcia R, Grandjean P, Jørgensen SL, Magi L, Mandalakis M, Orsi W, Polymenakou P, Schouw A, Vallicrosa G, Vlasopoulos O. (2021) Shallow-water hydrothermalism at Milos (Greece): Nature, distribution, heat fluxes and impact on ecosystems. *Marine Geology* 438; 106521.

E Capo, C Giguët-Covex, A Rouillard, K Nota, P D Heintzman, A Vuillemin, D Ariztegui, F Arnaud, S Belle, S Bertilsson, C Bigler, R Bindler, AG Brown, CL Clarke, SE Crump, D Debroas, G Englund, GF Ficetola, RE Garner, J Gauthier, I Gregory-Eaves, L Heinecke, U Herzsich, A Ibrahim, V Kisand, KH Kjær, Y Lammers, J Littlefair, E Messenger, ME Monchamp, F Olajos, **W Orsi**, MW Pedersen, DP Rijal, J Rydberg, T Spanbauer, KR Stoof-Leichsenring, P Taberlet, L Talas, C Thomas, DA Walsh, Y Wang, E Willerslev, A van Woerkom, H H Zimmermann, MJL Coolen, LS Epp, I Domaizon, IG Alsos, L Parducci (2021) Lake sedimentary DNA research on past terrestrial and aquatic biodiversity: Overview and recommendations. *Quaternary* 4: 6.

Vuillemin A, Kerrigan Z, D'Hondt S, **Orsi W** (2020) Exploring the abundance, metabolic potential, and gene expression of seafloor Chloroflexi in million-year-old oxic and anoxic abyssal clay. *FEMS Microbiology Ecology* 96: fiae223.

Vuillemin A, Vargas S, Coskun O, Pockalny R, Murray R, Smith DC, D'Hondt S, **Orsi W*** (2020) Atribacteria reproducing over millions of years in the Atlantic abyssal seafloor. *mBio* 11:e01937-20.

Orsi W*, Morard R, Vuillemin A, Eitel M, Wörheide G, Milucka J, Kucera M. (2020) Anaerobic metabolism of Foraminifera thriving below the seafloor. *The ISME Journal* 14: 2580-2594.

Orsi W*, Vuillemin A, Rodriguez P, Coskun O, Gomez G, Mohrholz V, Lavik G, Ferdelman T (2020) Metabolic activity analyses demonstrate that Lokiarchaeon exhibits

homoacetogenesis in sulfidic marine sediments. *Nature Microbiology* 5: 248–255.

Einsiedl F, Wunderlich A, Sebito M, Coskun ÖK, **Orsi W**, Mayer B (2020) Biogeochemical evidence of anaerobic methane oxidation and anaerobic ammonium oxidation in a stratified lake using stable isotopes. *Biogeosciences* 17: 5149–5161.

Orsi W*, Schink B, Buckel W, Martin WF (2020) Physiological limits to life in anoxic subseafloor sediment. *FEMS Microbiology Reviews* 2: 219-231.

LaRowe DE, Arndt S, Bradley JA, Estes ER, Hoarfrost A, Lang SQ, Lloyd KG, Mahmoudi N, **Orsi W**, Shah Walter SR, Steen AD, Zhao R (2020) The fate of organic carbon in marine sediments – New insights from recent data and analysis. *Earth-Science Reviews* 204: 103146.

Girard EB, Kaliwoda M, Schmahl WW, Wörheide G, **Orsi W*** (2020) Biodegradation of textile waste by marine bacterial communities enhanced by light. *Environmental Microbiology Reports* 12: 406-418.

Vuillemin A, Wankel SD, Coskun OK, Magritsch T, Vargas S, Estes ER, Spivack AJ, Smith DC, Pockalny R, Murray RW, D'Hondt S, **Orsi W*** (2019) Archaea dominate oxic subseafloor communities over multimillion-year timescales. *Science Advances* 5:eaaw4108.

Coskun O, Özen V, Wankel S, **Orsi W*** (2019) Quantifying population specific growth in benthic bacterial communities under low oxygen using H₂¹⁸O. *The ISME Journal* 13, 1546-1559.

Ortega-Arbulu AS, Pichler M, Vuillemin A, **Orsi W*** (2019) Effects of organic matter and low oxygen on the mycobenthos in a coastal lagoon. *Environmental Microbiology* 21: 374-388.

Orsi W* (2018) Ecology and evolution of seafloor and subseafloor microbial communities. *Nature Reviews Microbiology* 16, 671-683.

Coskun OK, Pichler M, Vargas S, Gilder S, **Orsi W*** (2018) Linking uncultivated microbial populations with benthic carbon turnover using quantitative stable isotope probing. *Applied and Environmental Microbiology* 84(18): e01083-18.

Pichler M, Coskun O, Ortega AS, Conci N, Wörheide G, Vargas S, **Orsi W*** (2018) A 16S rRNA gene sequencing and analysis protocol for the Illumina MiniSeq platform. *MicrobiologyOpen* e00611.

Vuillemin A, Horn F, Friese A, Winkel M, Alawi M, Wagner D, Henny C, **Orsi W**, Crowe SA, Kallmeyer J (2018) Metabolic potential of microbial communities from ferruginous sediments. *Environmental Microbiology* 20, 4297-4313.

Vuillemin A, Ariztegui D, Horn F, Kallmeyer J, **Orsi W**, the PASADO Science Team (2018) Microbial community composition along a 50,000 year lacustrine sediment sequence. *FEMS Microbiology Ecology* 94, fty029.

Kose SH, Grice K, **Orsi W**, Ballal M, Coolen MJL (2018) Metagenomics of pigmented and cholesterol gallstones: the putative role of bacteria. *Scientific Reports* 8, 11218.

Giosan L, **Orsi W**, Coolen M, Wuchter C, Dunlea AG, Thirumalai K, Munoz S, Clift PD, Donnelly JP, Galy V, Fuller DQ (2018) Neoglacial climate anomalies and the Harappan Metamorphosis. *Climate of the Past* 14, 1669-1686.

More KD, **Orsi W**, Galy V, Giosan L, He L, Grice K, Coolen MJL (2018) A 43 kyr record of protist communities and their response to oxygen minimum zone variability in the Northeastern Arabian Sea. *Earth and Planetary Science Letters* 496, 248-256.

Orsi W*, Richards TA, Francis WR (2018) Predicted microbial secretomes and their target substrates in marine sediments. *Nature Microbiology* 3: 32-37.

Orsi W*, Wilken S, del Campo J, Heger T, James E, Richards TA, Keeling PJ, Worden AZ, Santoro AE (2018) Identifying protist consumers of photosynthetic picoeukaryotes in the surface ocean using stable isotope probing. *Environmental Microbiology* 20, 815-827

He K, Gilder SA, **Orsi W**, Zhao X, Petersen N (2017) Constant flux of spatial niche partitioning through high-resolution sampling of magnetotactic bacteria. *Applied and Environmental Microbiology* 83(20) e01382-17.

Orsi W*, Coolen MJ, Wuchter C, He L, More KD, Irigoien X, Chust G, Johnson C, Hemingway JD, Lee M, Galy V, Giosan L (2017) Climate oscillations reflected in the microbiome of Arabian Sea sediments. *Scientific Reports* 7: 6040.

Orsi W*, Jørgensen BB, Biddle JF (2016) Transcriptional analysis of sulfate reducing and chemolithoautotrophic sulfur oxidizing bacteria in the deep subseafloor. *Environmental Microbiology Reports* 8, 452-460.

Orsi W*, Smith JM, Liu S, Liu Z, Sakamoto CM, Wilken S, Poirier C, Richards TA, Keeling PJ, Worden AZ, Santoro AE (2016) Diverse, uncultivated bacteria and archaea underlying the cycling of dissolved protein in the ocean. *The ISME Journal* 10, 2158-2173.

Klein F, Humphris SE, Guo W, Schubotz F, Schwarzenbach EM, **Orsi WD** (2015) Fluid mixing and the deep biosphere of a fossil Lost City-type hydrothermal system at the Iberia Margin. *PNAS* 112, 12036-12041.

Orsi W*, Richards TA, Santoro AE (2015) Cellular maintenance processes potentially underpin the survival of subseafloor fungi over geological timescales. *ECSS* 164: A1-A9.

Orsi W*, Smith JM, Wilcox HM, Swalwell JE, Carini P, Worden AZ, Santoro AE (2015). Ecophysiology of uncultivated marine euryarchaea is linked to particulate organic matter. *The ISME Journal* 9: 1747-1763.

Coolen MJL** and **Orsi W**** (2015) The transcriptional response of microbial communities in thawing Alaskan permafrost soils. *Frontiers in Microbiology* 6:197. **Co-first authors.

Engelhardt T, **Orsi W**, Jørgensen BB (2015) Viral activities and life-cycles in deep subseafloor sediment. *Environmental Microbiology Reports* 7: 868-873.

Santoro AE, Dupont CL, Richter RA, Craig MT, Carini P, McIlvin MR, Yang Y, **Orsi W**, Moran D, Saito MA (2015). Genomic and proteomic characterization of ‘Candidatus *Nitrosopelagicus brevis*’: an ammonia-oxidizing archaeon from the open ocean. *PNAS* 114:1173-1178.

Orcutt BN, LaRowe D, Lloyd K, Mills H, **Orsi W**, Reese BK, Sauvage J, Huber JA, Amend J. (2014) IODP deep biosphere research workshop report – a synthesis of recent investigations, and discussion of new research questions and drilling targets. *Scientific Drilling* 2:1-6.

Stoeck T, Filker S, Edgcomb V, **Orsi W**, Yakimov M, Pachiadaki M, Breiner HW, LaCono V, Stock A. (2014) Living at the limits: Evidence for microbial eukaryotes thriving under pressure in deep anoxic, hypersaline habitats. *Advances in Ecology* doi:10.1155/2014/532687

Orsi W*, Edgcomb V, Christman G, Biddle J. (2013). Gene expression in the deep biosphere. *Nature* 499: 205-208.

Coolen MJL, **Orsi W**, Balkema C, Quince C, Harris K, Sylva S, Filipova-Marinova M, Giosan L. (2013). Evolution of the plankton paleome in the Black Sea from the Deglacial to Anthropocene. *PNAS* 110(21): 8609-14.

Orsi W*, Biddle J, Edgcomb V. (2013). Deep sequencing of subseafloor eukaryotic rRNA reveals active Fungi across multiple subseafloor provinces. *PLoS ONE* 8(2): e56335.

Burgaud G, Woehlke S, Redou V, **Orsi W**, Beaudoin D, Barbier G, Biddle J, Edgcomb V. (2013). Deciphering presence and activity of fungal communities in marine sediments using a model estuarine system. *Aquatic Microbial Ecology* 70: 45-62.

Stock A, Edgcomb V, **Orsi W**, Filker S, Breiner HW, Yakimov M, Stoeck T. (2013). Evidence for isolated evolution of deep-sea ciliate communities through geological separation and environmental selection. *BMC Microbiology* 13:150.

Edgcomb V, Bernhard J, Summons R, **Orsi W**, Beaudoin D, Visscher P. (2013). Active eukaryotes in microbialites from Highborne Cay, Bahamas, and Hamelin Pool (Shark Bay), Australia. *The ISME Journal*. 8: 418-429.

Edgcomb V, **Orsi W**, Biddle J. (2013) Fungi in the marine subsurface; In: Kallmeyer, J. and Wagner, D. (eds.), *Microbial life of the Deep Biosphere*. (in press) De Gruyter, Berlin.

Orsi W*, Song Y, Hallam S, Edgcomb V. (2012). Effect of oxygen minimum zone formation on communities of marine protists. *The ISME Journal* 6: 1586-1601.

Orsi W, Edgcomb V, Faria J, Foissner W, Fowle W, Hohmann T, Suarez S, Taylor C, Taylor GT, Vdacny P, Epstein S. (2012). Class Ciliophora, a novel ciliate taxon from the anoxic Cariaco Basin, Venezuela; *IJSEM* 62: 1425-1433.

Orsi W*, Charvet S, Vd'áčný P, Bernhard JM, Edgcomb V. (2012). Prevalence of partnerships between bacteria and ciliates in oxygen-depleted marine water columns. *Frontiers in Extreme Microbiology* 3: 341.

Vdacny P, Bourland W, **Orsi W**, Epstein S, Foissner W. (2012). Genealogical analyses of multiple loci of litostomatean ciliates (Protista, Ciliophora, Litostomatea). *Molecular Phylogenetics and Evolution* 65(2): 397-411.

Filker S, Stock A, Breiner H W, Edgcomb V, **Orsi W**, Yakimov M, Stoeck T. (2012). Environmental selection of protistan plankton communities in hypersaline anoxic deep-sea basins, Eastern Mediterranean Sea. *MicrobiologyOpen* 2(1): 54-63.

Orsi W and Edgcomb V. (2012). Microbial Eukaryotes in Oxygen Minimum Zones; In: Seckbach, J., Oren, A., and Stan-Lotter, H. (eds.), *Polyextremophiles – Organisms living under multiple stress*; Springer, Dordrecht.

Edgcomb V and **Orsi W.** (2012). Microbial Eukaryotes in Hypersaline Anoxic Deep Sea Basins; In: Seckbach, J., Oren, A., and Stan-Lotter, H. (eds.), *Polyextremophiles – Organisms living under multiple stress*; Springer, Dordrecht.

Orsi W, Edgcomb V, Jeon S O, Leslin C, Bunge J, Taylor G T, Varela R, Epstein S. (2011). Protistan microbial observatory in the Cariaco Basin, Caribbean. Part II. Habitat specialization. *The ISME Journal* 5:1344-1356.

Edgcomb V, **Orsi W**, Bunge J, Jeon S O, Leslin C, Christen R, Holder M, Taylor G T, Suarez P, Varela R, Epstein S. (2011). Protistan microbial observatory in the Cariaco Basin, Caribbean. Part I. Pyrosequencing vs. Sanger insights into species richness. *The ISME Journal* 5: 1357-1373.

Edgcomb V, **Orsi W**, Taylor G T, Vd'ačný P, Taylor C, Suarez P, Epstein S. (2011). Commentary: Accessing marine protists from the anoxic Cariaco Basin. *The ISME Journal* 5: 1237-1241.

Edgcomb V, **Orsi W**, Breiner HW, Stock A, Filkner S, Yakimov M, Stoeck T. (2011). Eastern Mediterranean deep hypersaline anoxic lakes: novel active kinetoplastids associated with halocline habitats. *Deep-Sea Research I* 58 (10): 1040-1048.

Vd'ačný P, Bourland W, **Orsi W**, Epstein S, Foissner W. (2011). Phylogeny and classification of the Litostomatea (Protista, Ciliophora), with an emphasis on free-living taxa and the 18S rRNA gene. *Molecular Phylogenetics and Evolution* 59 (2): 510-522.

Vd'ačný P, **Orsi W**, Bourland W, Satoshi S, Epstein S, Foissner W. (2011). Morphological and molecular phylogeny of Dileptids: resolution at the base of the class Litostomatea (Ciliophora, Intramacronucleata). *European Journal of Protistology* 47 (4): 295-313.

Vd'ačný P, **Orsi W**, Foissner W. (2010). Molecular and morphological evidence for a sister group relationship of the classes Armophorea and Litostomatea (Ciliophora, Intramacronucleata, Lamellicorticata infraphyl. nov.), with an account on basal haptorid litostomateans. *European Journal of Protistology* 46 (4): 298-309.

Edgcomb V, **Orsi W**, Leslin C, Epstein SS, Bunge J, Jeon S, Yakimov MM, Behnke A, Stoeck T. (2009). Protistan community patterns within the brine and halocline of deep hypersaline anoxic basins in the eastern Mediterranean Sea. *Extremophiles* 13 (1): 151-167.

Stoeck T, Behnke A, Christen R, Amaral-Zettler L, Rodriguez-Mora MJ, Chistoserdov A, **Orsi W**, Edgcomb VP. (2009). Massively parallel tag sequencing reveals the complexity of anaerobic marine protistan communities. *BMC Biology* 7:72.

Research Awards

2016-2025 Total research funding raised as third party grants: € 2,774,107

Individual projects:

2025-2028 German National Research Foundation (DFG) grant awarded (€ 248,230): **“The deep biosphere below the Baltic Sea seafloor”**. Principle Investigator: **William Orsi**.

2025-2028	German National Research Foundation (DFG) grant awarded (€ 302,400): “Ribozyme trapping in ferruginous chemical gardens” . Principle Investigator: William Orsi .
2023-2026	German National Research Foundation (DFG) grant awarded (€ 247,477): “Investigating the food chain from magnetotactic bacteria to protozoa under laboratory and environmental conditions” . Principle Investigator: William Orsi .
2023-2026	German National Research Foundation (DFG) grant awarded (€ 260,000): “Testing the habitability of simulated Hadean hydrothermal vent ecosystems” . Principle Investigator: William Orsi .
2022-2025	German National Research Foundation (DFG) grant awarded (€ 565,000): “Illuminating the ecology of marine fungi using quantitative stable isotope probing” . Principle Investigator: William Orsi .
2021-2022	DFG Excellence Initiative Investitionsfonds Award (€ 100,000): “Radiolysis and deep life” . Principle Investigator: William Orsi .
2018-2021	German National Research Foundation (DFG) grant awarded (€ 617,000): “Tracing primordial metabolism reflected by microorganisms at hydrothermal vents” . Co-Principle Investigator: William Orsi .
2017-2020	German National Research Foundation (DFG) grant awarded (€ 360,000): “Aerobic microbial activity in deep sea abyssal clay” . Principle Investigator: William Orsi .
2018-2019	German National Research Foundation (DFG) grant awarded (€ 24,000): “Characterizing the activity of the mycoplankton and mycobenthos in the Benguela upwelling system” . Principle Investigator: William Orsi .
2016-2017	Junior Researcher Award (DFG excellence initiative) research grant awarded (€ 50,000): “Genome evolution over geological timescales in marine sediment”
2011-2013	Center for Dark Energy Biosphere Investigations (C-DEBI) postdoctoral fellowship grant awarded (€ 120,000): “Fungal activity in deep seafloor marine sediment”

Invited talks (last ten years)

2026*	<i>“Methanogenesis fueled by abiotic H₂ production in chemical gardens simulating the early earth and exoplanets”</i> . Invited talk, Gordon Research Conference on Microbial One-Carbon Metabolism, Evolution & Ecology of C1-Transformations, Waterville Valley (USA). (*invited to be presented on at the 2026 GRC in Waterville Valley, NH on June 30 th)
2024	<i>“Constraining fungal carbon cycling in marine and terrestrial ecosystems through quantitative DNA stable isotope probing”</i> Invited seminar, Department of Ecology and Genetics, University of Uppsala (Sweden).
2024	<i>“Microbial ecology and carbon cycling in the Benguela Upwelling System, Namibia”</i> . Invited seminar, Department of Microbiology, Wageningen University (Netherlands).
2023	<i>“Hydrogen utilization by endolithic life in ultramafic ocean crust”</i> . Invited seminar, Serpentine days lecture series (https://serpentinedays.org/).

- 2023 “*Endolithic life in oceanic crust*”. Invited seminar, Magellan³ workshop for IODP proposal planning, Rome (Italy).
- 2022 “*Microbial life in million-year-old seafloor sediment*”. Invited seminar, Department of Earth Science, University of Hamburg (Germany).
- 2022 “*Microbial life in million-year-old seafloor sediment*”. Invited seminar, Department of Microbiology, Radboud University, (Netherlands).
- 2022 “*Quantitative aquatic microbial ecology via stable isotope probing*”. Invited seminar, Department of Biology, NORDCEE, Southern Denmark University, Odense (Denmark).
- 2021 “*Quantitative aquatic microbial ecology via stable isotope probing*”. Invited seminar, Department of Microbiology, University of Massachusetts, Amherst (USA).
- 2021 “*Microbial life in million-year-old seafloor sediment*”. Invited seminar, Department of Earth Science, ETH Zurich, (Switzerland).
- 2021 “*Quantitative aquatic microbial ecology via stable isotope probing*”. Invited seminar, Department of Earth and Planetary Sciences, MIT, Cambridge (USA).
- 2021 “*Chloroflexi in million-year-old oxic and anoxic deep-sea clay*”. Invited seminar, FEMS Microbiology online seminar series.
- 2019 “*Measuring activity in abyssal seafloor microbial communities*”. Invited seminar, German-Israeli Young Scientists Meeting, Bremen (Germany).
- 2019 “*High-throughput omics approaches for linking microbial diversity with aquatic carbon cycling*”. Invited seminar, International Society for Environmental Biogeochemistry, GFZ Potsdam, Potsdam (Germany).
- 2019 “*Deciphering population-specific activities of marine microbes with quantitative stable isotope probing*”. Invited seminar, Max Planck Institute for Marine Microbiology, Bremen (Germany)
- 2019 “*Deciphering population-specific activities of marine microbes with quantitative stable isotope probing*”. Invited seminar, Division of Microbial Ecology (DOE), University of Vienna (Austria)
- 2019 “*Selection of distinct seafloor microbiomes under oxic and anoxic conditions over million-year timescales*”. Invited oral presentation, American Society for Microbiology annual meeting (ASM Microbe), San Francisco, (USA).
- 2019 “*Connecting microbial diversity with carbon cycling in marine sediments*”. Invited seminar, Institute of Marine Chemistry and Biology, University of Oldenburg (Germany).
- 2019 “*The power of microbes: small size, big impact*” Pint of Science public lecture series, Munich (Germany).
- 2019 “*Connecting microbial diversity with carbon cycling in marine sediments*”. Invited seminar, Department of Environmental Microbiology, University of Jena (Germany).
- 2018 “*Connecting microbial diversity with carbon cycling in marine sediments*”. Invited seminar, Department of Earth Sciences, Technical University of Munich (Germany).
- 2018 “*Connecting microbial diversity with carbon cycling in marine sediments*”. Invited seminar, Department of Microbiology and Biotechnology, Karlsruhe Institute of Technology (Germany).
- 2017 “*Nucleic acid insights into present and past life in marine sediment*”. Invited seminar, Leibniz Institute German Collection of Microorganisms and Cell Cultures GmbH, Braunschweig (Germany).
- 2016 “*Marine microbial ecosystem responses to past and present water column anoxia*”. Invited seminar, Department of Biology, NORDCEE, Southern Denmark University, Odense (Denmark).
- 2016 “*Shedding light on the ocean’s deep, dark biosphere*”. Invited seminar, Munich Geocenter, Munich (Germany).
- 2016 “*Climate oscillations reflected in the Arabian Sea seafloor microbiome*”. Invited seminar, European Geoscience Union, Vienna (Austria).

- 2016 “*Shedding light on the ocean’s deep, dark biosphere*”. Invited seminar, Center for Nanotechnology (CeNS), Munich (Germany).
- 2015 “*Marine microbial ecosystem responses to past and present water column anoxia*.” Invited seminar, Graduate School of Oceanography, University of Rhode Island (USA).
- 2015 “*Nucleic acid insights into present and past life in marine sediment*”. Invited seminar, Department of Earth Science, Princeton University (USA).

Conference presentations (last five years)

- 2025 “*Fungi stabilize carbon across the land-sea interface in high Arctic ecosystems*”. Trejos-Espeleta JC, Bradley J, Coskun O, Gomez G, W Orsi. Oral presentation, Goldschmidt conference (Prague, CZ)(*presented by JC Trejos-Espeleta).
- 2025 “*Deoxygenation effects on dissolved organic matter cycling and microbial metabolisms in a seasonally anoxic basin*”. Gomez-Saez G, Coskun O, Renken M, Muschler K, Marshall I, Dittmar T, Orsi W. Oral presentation at 2025 Goldschmidt conference (Prague, CZ) (*presented by G. Gomez).
- 2025 “*Testing emergence of life hypotheses using chemical gardens simulating early Earth hydrothermal geochemistry*”. Helmbrecht V, Braun D, Reichelt R, Grohman D, Orsi W. Poster presented at Goldschmidt 2025 conference (Prague, CZ)(*presented by V. Helmbrecht).
- 2025 “*Testing emergence of life hypotheses using chemical gardens simulating early Earth hydrothermal geochemistry*”. Helmbrecht V, Braun D, Reichelt R, Grohman D, Orsi W. Poster presented at Molecular Origins of Life Munich 2025 conference (Munich)(*presented by V. Helmbrecht).
- 2024 “*Microbially driven carbon transformations in the warming Arctic: from ice to ocean*”. Bradley J, Cramm M, Coskun O, Lloyd K, Jungblut A, Trejos-Espeleta JC, Marín-Jaramillo JP, Schmidt S, Sommers P, Orsi W, Hülse D, LaRowe D, Arndt S. Presented at the 2024 Goldschmidt conference (*presented by J. Bradley).
- 2023 “*Fungal organic nitrogen assimilation and community assembly across a 100-year Arctic proglacial soil chronosequence*”. Trejos-Espeleta JC, Bradley J, Coskun O, Gomez G, Schmidt S, W Orsi. Poster presented at Goldschmidt 2023 conference (Lyon, France). (*presented by JC Trejos-Espeleta)
- 2023 “*Carbon assimilating fungi from surface ocean to seafloor revealed by coupled phylogenetic and stable isotope analysis*”. Oral presentation at the 2023 Goldschmidt conference (Lyon, France). (*presented by W Orsi)
- 2023 “*Microfluidic Quasi-2-Dimensional Alkaline Vent Model to Study Precipitation Morphology, Fluid Flows and Molecule Accumulation*”. Weingart M, Chen S, C Donat, Helmbrecht V, Orsi W, Braun D, Alim K. Poster presentation at the 2023 Goldschmidt conference (Lyon, France) (*presented by M. Weingart).
- 2023 “*Bioavailability of Fe(II) chimneys formed under Enceladus-like conditions*.” Tenelanda L, Helmbrecht V, Chiu TH, Orsi W, Kappler A. Poster presentation at the American Geophysical Union 2023 Fall meeting (*presented by L. Tenelanda).
- 2023 “*Spatial dynamics of marine dissolved organic matter in the Benguela upwelling system*”. Gomez-Saez G, Coskun OK, Oertel Y, Niggemann J, Dittmar T, Ferdelman TG, Orsi W. Oral presentation at EGU General Assembly (*presented by G. Gomez).
- 2023 “*Dissolved organic sulfur utilization by marine benthic microbial communities revealed by quantitative DNA stable isotope probing*”. Coskun OK, Orsi W, D'Hondt S, Gomez-Saez G. Oral presentation at EGU General Assembly (*presented by O. Coskun)

2021 “*Exceptional preservation of lipid biomarkers in a cretaceous serpentinite-hosted subseafloor hydrothermal system*”. Schubotz F, Meyer L, Orsi W, Klein F. Presented at the International Meeting of Organic Geochemistry (IMOG, *presented by F. Schubotz).

Teaching Experience (last ten years)

2022-present Lecturer for the *Earth System Science in Climate and Environmental Change* course, Bachelor of Geoscience Program at LMU Munich (summer semester). Number of Bachelor students typically 20-30.

2016-present Lecturer for the *Global Biogeochemical Cycles* Masters course in Geobiology and Paleobiology Program, at LMU Munich (winter semester). Number of Master students typically 5-15.

2016-present Lecturer for the *Geomicrobiology* Masters course (lab practical) in Geobiology and Paleobiology Program, at LMU Munich (winter semester). Number of Master students typically 3-7.

2016-present Lecturer and field course instructor for the *Geobiology* undergraduate course, Bachelor of Geoscience Program at LMU Munich (summer semester). Number of Bachelor students typically 15-25.

2016-present Lecturer for the *Marine Geology* undergraduate course, Geoscience Bachelors Program at LMU Munich (winter semester). Number of Bachelor students typically 15-25.

2016-present Field course leader and instructor for the *Marine Geology* undergraduate geological field course (Bachelor of Geoscience Program at LMU Munich). Five-day intensive field course to the Luisitanian Basin, Portugal (winter semester). Number of Bachelor students typically 15-25.

2016-present Lecturer for the *Laboratory Methods* Masters course (lab practical) in Geobiology and Paleobiology Program, at LMU Munich (summer semester). Number of Master students typically 3-7.

Mentorship and supervision (last ten years)

2016-present Direct supervisor for 15 Bachelors Student theses and 19 Masters Student theses

2016-present Direct supervisor for 6 Ph.D students and 2 postdocs (see table for summary, more information at : www.orsigeomicrobiologylab.com)

Directly supervised Ph.D students and postdocs (2016-2025)

Student/Postdoc	Project	Dates	Current status
Maja Bajic	Ecology and evolution of subseafloor magnetotactic bacteria	2025-2028	Ph.D student
Vanessa Helmbrecht	Testing origin of life hypotheses in hydrothermal vent experiments.	2022-2026	Ph.D student
Hanna Dienstbier	RNA accumulation in simulated early earth hydrothermal vents.	2024-2028	Ph.D student
Mitali Chitnis	The food chain of magnetotactic bacteria to predatory protozoa	2024-2026	Ph.D student
Juan C. Trejos	Quantifying the impact of fungal “dark matter” on the carbon cycle.	2023-2026	Ph.D student
Daniel Mills	Determining the effect of H ₂ on carbon metabolism of archaea.	2022-2025	Postdoc
Ömer Coskun	Carbon fixation by microbial “dark matter” in hydrothermal ecosystems.	2018-2022	Ph.D student, graduated 2022
Warren Francis	Transcriptomics of subseafloor life	2021-2022	Postdoc
Aurele Vuillemin	The deep biosphere in million-year-old subseafloor sediment	2017-2020	Postdoc

Leadership and service

University leadership and service roles:

- 2017-2024 Vice Director for Department of Earth and Environmental Science, LMU Munich
- 2022-present Chair of the Munich GeoCenter (<https://www.munich-geocenter.org/>)
- Coordination and governance of the joint Bachelor degree program in Earth Science between the LMU and TUM
- 2019-2022 Dean of Students for the Faculty of Geoscience at LMU Munich (Department of Earth and Environmental Science).
- 2016-present Vice-chair of selection committee for Masters Program in Geobiology and Paleobiology (MGAP), at LMU Munich
- 2017-present Director of the Mentoring Program at LMU Munich (Faculty of Geoscience)

Workshop organization:

- March, 2026* Magellan³ workshop co-organizer: “*Young and Cool: installing long-term observatories to study microbiological processes on the Mid-Atlantic ridge flanks*”. MARUM, University of Bremen. (*scheduled for March 2026)
- 2025-2026* Co-organizer of the Center for Advanced Studies (CAS) Research Focus group at LMU Munich “*Space Science: The Space around us*”. Evening seminars, panel discussions, high-profile public events. (*planning phase in 2025, Focus group will begin in 2026).
- September, 2025 Workshop co-organizer: “*Bridging the terrestrial and marine deep biospheres*”. Hanse-Wissenschaftskolleg (HWK), Delmenhorst, Germany.
- May, 2024 Workshop organizer: “*The deep biosphere and beyond*”. Evangelical Academy, Tutzing, Germany.
- August, 2022 Workshop co-organizer: “*The deep biosphere and beyond*”. Schwarzwald, Germany.

Academic professional service (last ten years)

Reviewer for funding agencies: NSF Biological Oceanography Program, German Research National Funding Agency (DFG), Alexander von Humboldt Foundation, Swiss Science National Funding Agency, European Research Council (ERC), Swedish National Academy of Sciences, French National Research Agency (ANR) , European Union Marie Curie Postdoctoral Fellowship Program.

- Average of 5-10 proposals reviewed per year.

Reviewer for >20 journals: Nature, Nature Microbiology, Nature Reviews Microbiology, Science Advances, Geology, Geobiology, The ISME Journal, etc.

- Average of 10-20 papers reviewed per year.

Editor at the following journals: The ISME Journal, Environmental Microbiology

- Average of 15-25 papers edited per year.

Awards and recognition

- Winner of the 2025 “Outstanding Editorial Board Member” award for *The ISME Journal*
- Chemical garden chimney photographs selected as 2023 cover artwork for *Geobiology*
- Elected Dean of Students by the Student Council, Department of Earth and Environmental Science, Ludwig-Maximilians-Universität Munich (2019–2022)
- Elected Vice Director of the Department of Earth and Environmental Sciences by the Departmental Leadership Committee, Ludwig-Maximilians-Universität Munich, 2017–2024
- Elected Chair of the Munich Geocenter, by the Earth and Environmental Science Department Leadership Committee, Ludwig-Maximilians-Universität Munich (2019–2022)
- Faculty of 1000 recommended article published in *Nature Reviews Microbiology* (doi.org/10.1038/s41579-018-0046-8)
- Faculty of 1000 recommended article published in *The ISME Journal* (doi.org/10.1038/ismej.2016.20)
- Center for Dark Energy Biosphere (C-DEBI: NSF STC) postdoctoral fellowship (2011-2013)
- Scanning electron micrographs selected as winner of 2011 cover artwork prize for *The ISME Journal*