# Meret Aeppli

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## Education and Training

**Stanford University, United States**, Postdoctoral Fellow 09/2019 - present
Topic: Carbon Cycling in Soils: Effects of Mineral Redox Reactivity on Anaerobic Microbial Respiration
Advisor: Prof. Dr. S. Fendorf

**ETH Zürich, Switzerland**, Doctor of Sciences 01/2015 - 12/2018
Dissertation: Assessing the Control of Reduction Thermodynamics on Electron Transfer to Iron (Oxyhydr-)Oxides (Diss. Nr. 25'699)
Defense date: 07.12.2018
Advisor: Dr. T.B. Hofstetter
Committee: Dr. M. Sander, Dr. A. Voegelin, Prof. Dr. K. McNeill, Prof. Dr. J. Peña

**ETH Zürich, Switzerland**, M.Sc. in Environmental Sciences 09/2012 - 01/2015
Concentration: Biogeochemistry and Pollutant Dynamics
Thesis: Interactions of Bacteriophages with Natural Organic Matter and Model Sorbent Surfaces
Advisor: Dr. M. Sander

**ETH Zürich, Switzerland**, B.Sc. in Environmental Sciences 09/2009 - 10/2012
Thesis: Soil Structure of an Alpine Fen and Its Implications on Below-Ground Methane Concentrations
Advisor: Prof. Dr. J. Zeyer

**London Music School, England**, Diploma in Music Performance and Production 04/2009 - 09/2009
Concentration: Piano and Vocals

## Research Experience

**Stanford University, United States**, Postdoctoral Fellow in Soil and Environmental Biogeochemistry 09/2019 - present
Linked carbon dioxide production during anaerobic microbial respiration to mineral redox reactivity in floodplain soils.

**Eawag, Switzerland**, Postdoctoral Fellow in Environmental Chemistry 07/2021 - 08/2021
Characterized redox-buffering properties of synthetic clay minerals using a mediated electrochemical approach.

**ETH Zürich, Switzerland**, Field Researcher in Environmental Chemistry 07/2019
Quantified electron donating properties of particulate organic matter using a push-pull approach in wetlands near Filipstad, Sweden.

**Eawag, Switzerland**, Research Assistant in Environmental Chemistry 01/2019 - 06/2019
Adapted procedure to analyze compound specific stable isotope data for nitroaromatic explosives.

**Eawag and ETH Zürich, Switzerland**, Doctoral Candidate in Environmental Chemistry 01/2015 - 12/2018
Developed mediated electrochemical approach to characterize redox properties of iron oxides; linked rates and extents of iron oxide reduction to thermodynamic driving force of reaction; quantified changes in redox reactivity of iron oxides during abiotic and microbially mediated iron oxide transformations.

**ETH Zürich, Switzerland**, Graduate Researcher in Environmental Chemistry 09/2013 - 04/2014
Quantified bacteriophage adsorption to natural organic matter and model sorbent surfaces using quartz crystal microbalance with dissipation monitoring.

**ETH Zürich, Switzerland**, Research Assistant in Environmental Microbiology 06/2012 - 08/2012
Analyzed methane production in wetland soil incubations.

**ETH Zürich, Switzerland**, Undergraduate Researcher in Environmental Microbiology 02/2012 - 06/2012
Collected wetland soil cores and quantified leaf, moss, and root surface areas along core depths.

## Honors

**Early Postdoc Mobility Fellowship** 09/2019 - 02/2021
Fellowship for postdoctoral research at Stanford University; sponsored by the *Swiss National Science Foundation*; CHF 120'000.

**Rising Environmental Leaders Program** 01/2020 - 06/2020
Run by the *Stanford Woods Institute for the Environment*; aimed at honing participant's leadership and communication skills to maximize their research impact and connect research to policy and people; one of 20 participants selected from a field of applicants from all seven schools at Stanford.

**ETH Medal for Outstanding Doctoral Thesis** 09/2019
Awarded for "solving important knowledge gaps in the redox reactivity of iron using an interdisciplinary approach". ETH Zürich awards the medal and CHF 2'000 to the top 8% of doctoral candidates.

**Chemistry Travel Award** 05/2017
Travel award for the attendance of *Goldschmidt Conference* 2017; sponsored by the *Swiss Chemical Society* and *Platform Chemistry* of the *Swiss Academy of Sciences*; CHF 1'000.

## Peer-Reviewed Publications

**Aeppli, M**; Babey, T; Engel, M; Fendorf, S, Bargar, JR; Boye, K. Export of Organic Carbon From Reduced Fine-Grained Zones Governs Biogeochemical Reactivity in Simulated Aquifer. *Environmental Science & Technology*, **2022**, 56 (4), 2738-2746, doi:10.1021/acs.est.1c04664.

**Aeppli, M**; Giroud, S; Vranic, S; Voegelin, A; Hofstetter, TB; Sander, M. Thermodynamic Controls on Rates of Iron Oxide Reduction by Extracellular Electron Shuttles. *Proceedings of the National Academy of Sciences of the United States of America*, **2022**, 119 (3), e2115629119, doi:10.1073/pnas.2115629119.

Biswakarma, J; Rushworth, D; Srivastava, G; Singh, G; Kang, K; Das, S; Anantharaman, SB; **Aeppli, M**; Popp, AL; Bhuyan, DJ. Organizational Level Responses to the COVID-19 Outbreak: Challenges, Strategies and Framework for Academic Institutions. *Frontiers in Communication*, **2021**, 6:573585, doi:10.3389/fcomm.2021.573585.

**Aeppli, M**; Vranic, S; Kaegi, R; Kretzschmar, R; Brown, AR; Voegelin, A; Hofstetter, TB; Sander, M. Decreases in Iron Oxide Reducibility during Microbial Reductive Dissolution and Transformation of Ferrihydrite. *Environmental Science & Technology*, **2019**, 53 (15), 8736–8746, doi:10.1021/acs.est.9b01299.

**Aeppli, M**; Kaegi, R; Kretzschmar, R; Voegelin, A; Hofstetter, TB; Sander, M. Electrochemical Analysis of Changes in Iron Oxide Reducibility during Abiotic Ferrihydrite Transformation into Goethite and Magnetite. *Environmental Science & Technology*, **2019**, 53 (7), 3568-3578, doi:10.1021/acs.est.8b07190.

**Aeppli, M**; Voegelin, A; Gorski, CA; Hofstetter, TB; Sander, M. Mediated Electrochemical Reduction of Iron (Oxyhydr-)Oxides under Defined Thermodynamic Boundary Conditions. *Environmental Science & Technology*, **2018**, 52 (2), 560-570, doi:10.1021/acs.est.7b04411.

Armanious, A; **Aeppli, M**; Jacak, R; Refardt, D; Sigstam, T; Kohn, T; Sander, M. Viruses at Solid-Water Interfaces: A Systematic Assessment of Interactions Driving Adsorption. *Environmental Science & Technology*, **2016**, 50 (2), 732-743, doi:10.1021/acs.est.5b04644.

Franchini, AG; Henneberger, R; **Aeppli, M**; Zeyer, J. Methane Dynamics in an Alpine Fen: A Field-Based Study on Methanogenic and Methanotrophic Microbial Communities. *FEMS Microbiology Ecology*, **2015**, 91 (3), doi:10.1093/femsec/fiu032.

Armanious, A; **Aeppli, M**; Sander, M. Dissolved Organic Matter Adsorption to Model Surfaces: Adlayer Formation, Properties and Dynamics at the Nanoscale. *Environmental Science & Technology*, **2014**, 48 (16), 9420-9429, doi:10.1021/es5026917.

## Invited Talks

Exploring Mechanisms of Soil Organic Carbon Stabilization by Tracking Electron Flows in Soils. Virtual Public Lecture, *Technical University of Munich*, **2021**.

Tracking Electrons in Soils: How Electro-Active Minerals Affect Soil Carbon Turnover. Virtual Public Lecture, *Swiss Federal Institute of Technology Lausanne*, **2020**.

Follow the Electrons: How Redox-Active Minerals Affect Soil Carbon. Virtual Seminar, *University of California, Davis*, **2020**.

Redox Reactions In the Environment: What Can We Learn From Mediated Electrochemical Analyses? Virtual Seminar, *Indiana University-Purdue University Indianapolis*, **2020**.

## Conference Presentations

Thermodynamic Limitations on Microbial Respiration Using Ferric Iron as Terminal Electron Acceptor. *American Geophysical Union Fall 2021 Virtual Meeting*, **2021**.

Organic Matter Mineralization in Redox-Dynamic Environments: How Does the Redox Reactivity of Particulate Electron Acceptors Affect Microbial Respiration Rates? Oral presentation, virtually delivered. *Virtual Goldschmidt Conference*, **2021**.

Soil Organic Matter Stabilization in Floodplain Soils: Role of Particulate Terminal Electron Acceptors. Poster presentation. *American Geophysical Union Fall 2020 Virtual Meeting*, **2020**.

Is Carbon Mineralization In Floodplains Controlled by the Redox Reactivity of Iron Minerals? Oral presentation, virtually delivered. *American Chemical Society Fall 2020 Virtual Meeting*, **2020**.

How Does the Redox Reactivity of Iron Minerals Affect Carbon Mineralization in Floodplains? Oral presentation, virtually delivered. *Virtual Goldschmidt Conference*, **2020**.

Mediated Electrochemical Reduction of Iron (Oxyhydr-)Oxides under Defined Thermodynamic Boundary Conditions. Poster presentation. *Gordon Research Conferences on Environmental Science: Water*, Plymouth, New Hampshire, United States, **2018**.

Ferrous Iron-Induced Transformation of Ferrihydrite: Linking Changes in Oxide Mineralogy and Reducibility. Oral presentation. *Interfaces Against Pollution Conference*, La Grande-Motte, France, **2018**.

Investigating Iron Oxide Reduction Using Mediated Electrochemical Analysis. Oral presentation. *Goldschmidt Conference*, Paris, France, **2017**.

Investigating Iron Oxide Reduction Using Mediated Electrochemical Analysis. Oral presentation. *International Conference on the Biogeochemistry of Trace Elements*, Zürich, Switzerland, **2017**.

Thermodynamics of Electron Transfer to Iron Oxides Assessed by Mediated Electrochemical Reduction. Oral presentation. *Swiss Geoscience Meeting*, Geneva, Switzerland, **2016**.

Mediated Electrochemical Reduction of Iron Oxides: Effects of pH and Potential on Electron Transfer to the Oxides. Oral presentation. *European Mineralogical Conference*, Rimini, Italy, **2016**.

## Teaching Experience and Training

**Stanford University, United States**, Postdoc Teaching Certificate 10/2020
Comprises teaching training, elective courses and workshops, teaching practice, and teaching portfolio (minimum in-class time: 100 h).

**Stanford University, United States**, Lecturer 10/2020
Postdoc Journal Club on Pedagogical Approaches to Doctoral Supervision, one hour seminar.

**Stanford University, United States**, Lecturer 10/2020
SkillShare Stanford Earth on Electronic Lab Notebooks, one hour seminar.

**Indiana University-Purdue University Indianapolis, United States**, Lecturer 09/2020
Advanced Geology Seminar (GEOL-G 690), two hour seminar.

**ETH Zürich, Switzerland**, Teaching Assistant 01/2015 - 12/2018
Laboratory Course: Elementary Chemical Techniques (529-0030-00L), yearly three week intensive course.

**ETH Zürich, Switzerland**, Teaching Assistant 09/2011 - 09/2012
Exercises in Mathematics III: Systems Analysis (701-0071-00L), weekly classes.

## Mentoring Experience

Mentor at *Goldschmidt Conference* 07/2021
Supported mentees before, during and after the conference by introducing them to conference objectives and connecting them with scientists in their field.

Supervisor of Research Assistant 05/2021 - 07/2021
Trained undergraduate research assistant in the laboratory.

Mentor in the *Association for Women in Science* 09/2019 - 09/2020
Provided professional and personal support for undergraduate mentees.

Mentor at *Goldschmidt Conference* 06/2020
Supported mentees before, during and after the conference by introducing them to conference objectives and connecting them with scientists in their field.

Supervisor of Research Assistant 06/2018 - 08/2018
Trained research assistant in the laboratory and designed experimental work.

Supervisor of Undergraduate Student 02/2018 - 06/2018
Thesis (S. Giroud): Kinetics and Thermodynamics of Electron Transfer from Reduced Electron Transfer Shuttles to Iron Oxides.

Supervisor of Graduate Student 09/2017 - 04/2018
Thesis (S. Vranic): Iron Oxide Phase Transformations during Microbial Reduction of Ferrihydrite.

## Outreach and Service Activities

Convener at *Goldschmidt Conference* expected 07/2022
Convener of Session 12g (Theme 12): Environmental redox reactions and their impact on metal and nutrient dynamics.

Media Coverage of Publication *Thermodynamic Controls on Rates of Iron Oxide Reduction by Extracellular Electron Shuttles*, Physics World Magazine 02/2021
Lichtinger, S. The first electron counts – how anaerobic microbes 'breathe' iron. *Physics World magazine*, **2022**.

Press Release for Publication *Thermodynamic Controls on Rates of Iron Oxide Reduction by Extracellular Electron Shuttles*, Eawag News Portal 01/2022
Bryner, A. It all comes down to the first electron. *Eawag News Portal*, **2022**.

Convener at *Goldschmidt Conference* 07/2021
Convener of Session 11g (Theme 11): Redox-Driven Transformation and Mobility of Contaminants and Nutrients.

Convener at *American Geophysical Union Fall Meeting* 12/2020
Convener of Symposium 103775: Soils of the Anthropocene: Ecosystem Scale Implications of Pore-Scale Redox Heterogeneities in Soils.

Convener at *Goldschmidt Conference* 06/2020
Convener of Session 12b: Coupled Redox Cycling of S, Mn, and Fe: Impacts on Nutrient and Contaminant Dynamics.

Media Coverage of Field Research in Sweden, ETH Globe Magazine 09/2019
Rüegg, P. Waiting for Oxygen. *ETH Globe magazine*, **2019**, 3, 36-41.

Reviewer 06/2019 - present
For *Applied and Environmental Microbiology*, *Applied Geochemistry*, *Biogeosciences*, *Environmental Science & Technology*, *Environmental Science: Processes & Impacts*, *Journal of Geophysical Research: Biogeosciences*, *Nature Reviews Earth & Environment*. Complete list on Publons.

Scientifica Research Fair, ETH Zürich and University of Zürich 09/2017
Designed and presented exhibition booth on the degradation of plastics in the environment.

## Languages

German: native
English: fluent (CEFR level C2)
French: very good command (CEFR level B2)
Spanish: working knowledge (CEFR level A2)