**Session Proposal**

# Session Title

Linking Physical and Hydrological Processes with Soil Health and Functionality in Terrestrial Ecosystems

# Session Organizers

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# Session Description

The extremely high physical and hydrological heterogeneities and their dynamics define the spheres of soil biophysical and biological processes that are key regulating biogeochemical cycling and functionality of terrestrial ecosystems. In general, microbial diversity positively relates to multifunctionality across terrestrial ecosystems. Nevertheless, current understanding of the miraculous beauty observed in the vastly unknown soil micro-world and the underlying bio-physicochemical interactions and linkage with multifunctionality of the terrestrial ecosystems remains sketchy. In this session, we invite empirical and theoretical studies that investigate the biophysical-, biochemical-, biological-, and physicochemical processes that shape biogeochemical cycling and multifunctionality of terrestrial ecosystems. We also welcome research on the interactions between soil microbes, minerals, plants and fauna across temporal and spatial scales. We seek to establish a multidisciplinary platform for comprehensive reviewing, exchanging and communicating the current state of the-art, persistent knowledge gaps, and innovative research ideas, towards addressing the emerging challenges of disclosing the multifunctional roles of soil (bio)physics in a changing world.

# Format

Oral presentations, and poster presentations

# Proposed Speakers

**Speaker 1**

**Dani Or**, University of Nevada, Reno, dani.or@env.ethz.ch

Dr. Or is the Nevada Engineering Distinguished Professor, and was elected for the National Academy of Engineering of the United States (2022). Dr. Or is a world-leading expert in the field of soil science, and he is Fellow of the Soil Science Society of America (2004), Fellow of the American Geophysical Union (2010), Fellow of the Geological Society of America (2014), a recipient of the Kirkham Soil Physics Award (2001) and the Birdsall-Dreiss distinguished lecturer (2013) and the European Geosciences Union John Dalton Medal (2017).

**Speaker 2**

**Kate Scow**, UC Davis, kmscow@ucdavis.edu

Dr. Scow is the UC Davis Distinguished Professor of Soil Science and Microbial Ecology in the Department of Land, Air and Water Resources, a Fellow of the Soil Science Society of America, and was elected for the National Academy of Engineering (2022) and National Academy of Sciences (2022) of the United States. She was the Director of the Russell Ranch Sustainable Agriculture Facility that hosts the Century Experiment (<http://asi.ucdavis.edu/rr>) and Chair of the International Agricultural Development Graduate Group, and was the Chief Editor for the journal Soil Biology and Biochemistry.

**Speaker 3**

**Andrea Carminati**, ETH Zurich, [andrea.carminati@usys.ethz.ch](mailto:andrea.carminati@usys.ethz.ch)

Dr. Andrea Carminati is a chair professor at ETH Zurich, and is a leading expert in the field of soil science. Dr. Carminati has authored over 100 peer reviewed papers (including two Nature papers in 2024), with h-index 53.