

# WORKSHOP - 17-20 September 2024, DST, UniFi

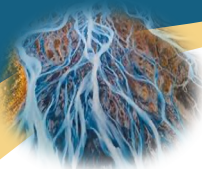
In presence & online on Gmeet

## Non-Gaussian distributions, dissipative dynamics and spatial organization in hydrological Earth systems

Department of Earth Sciences (DST)

Via G. la Pira 4., Florence

Sala Strozzi (Paleontology Museum)



## PROGRAM

### DAY 1 - 17.09.2024

 <https://meet.google.com/cco-radn-bzs>

## Short Course: Introduction to Dissipative Earth Systems

Introduction to the dissipative dynamics of environmental Earth systems (short course intro for students to provide background)


❖ 09:30 - 10:30 **Basics of dissipative systems** | Dr. Axel Kleidon

 Coffee break and informal discussions

❖ 11:00 - 12:00 **Hydroclimate and biogeochemistry** | Dr. Axel Kleidon

 Lunch break

❖ 15:00 - 16:00 **Soil hydrology** | Prof. Erwin Zehe

 Coffee break and informal discussions

❖ 16:30 - 17:30 **Runoff and catchments** | Prof. Erwin Zehe

### DAY 2 - 18.09.2024

 <https://meet.google.com/vzs-dndc-rmt>

## Opening and Introduction

❖ 09:15 - 9:30

Greetings, Welcome and Introduction

Antonella Buccianti – University of Florence and NBFC, Italy

## (A) Dissipative Dynamics in Hydrological Earth Systems

❖ 09:30 - 10:00


The Hydrological Cycle as a Dissipative System

Axel Kleidon - Max Planck Institute for Biogeochemistry, Germany

❖ 10:00 - 10:30

Dispersion, the ignored flip side of dissipation

Gunnar Lischeid - ZALF and University of Potsdam, Germany

 Coffee break and informal discussions

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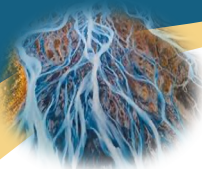
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## (A) Dissipative Dynamics in Hydrological Earth Systems

- ❖ 11:00 - 11:30 Thermodynamic constraints on atmospheric dehumidification by rainfall  
Sarosh Alam Ghausi - Max Planck Institute for Biogeochemistry, Germany
- ❖ 11:30 - 12:00 Application of non-equilibrium thermodynamic framework to characterize evolution of subsurface preferential pathways due to geochemical weathering-transport interaction  
Evgeny Shavelzon - Technion - Israel Institute of Technology

✂ Lunch break

- ❖ 14:30 - 15:00 Spectral variability of seismo-acoustic energy released by complex hydrological processes  
G. Belli and E. Marchetti - University of Florence, Italy
- ❖ 15:00 - 15:30 Effects of Storage on Distributions and Scaling laws generated under a disequilibrium  
Tejasvi Chauhan - Max Planck Institute for Biogeochemistry, Germany

☕ Coffee break and informal discussions

## (B) Non-Gaussian Distributions in Dissipative Systems

- ❖ 16:00 - 16:30 Probability Distributions in River Catchment Geochemistry  
Caterina Gozzi - University of Florence and NBFC, Italy
- ❖ 16:30 - 17:00 Anomalous transport governed by power-law travel time distributions  
Brian Berkowitz - Weizmann Institute of Science, Israel
- ❖ 17:00 - 17:30 Bifurcating paths: the relation between preferential pathways, channel splitting, under-sampled regions, and tortuosity on the Darcy scale  
Yaniv Edery - Technion - Israel Institute of Technology

❖ 20:00-23:00 ✂ Workshop dinner

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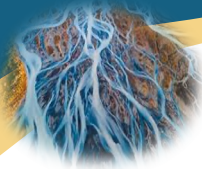
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**DAY 3 - 19.09.2024**

 <https://meet.google.com/swb-ocqy-vgk>

### (C) Dissipative Systems and Structure

- ❖ 09:00 - 09:30 River networks, logistic growth and dissipative dynamics- where is the connection?  
Erwin Zehe - Karlsruhe Institute of Technology, Germany
- ❖ 9:30 - 10:00 Vertical connectivity in the Critical Zone and water flow paths in a headwater catchment  
Christophe Hissler - Luxembourg Institute of Science and Technology
- ❖ 10:00 - 10:30 Modeling overland flow by splitting into sheet and rill components during simulated rainfall extremes  
Doga Yahsi - Karlsruhe Institute of Technology, Germany

 Coffee break and informal discussions

- ❖ 11:00-11:30 Spatial organization and entropy of groundwater pathways  
Massimiliano Schiavo - University of Padua, Italy
- ❖ 11:30-12:00 Modeling dissipative structures in natural systems  
Giordano Montegrossi - CNR-IGG, Italy
- ❖ 12:00-12:30 Dynamic soil configuration to meet the system's dissipation demands  
Conrad Jackisch - TU Bergakademie Freiberg, Germany

 Lunch break

### Breakouts, Discussions and Conclusions

- ❖ 15:00-16:30
  - Breakout groups on:
    - [A] Dissipative systems
    - [B] Non-Gaussian distributions
    - [C] Structure formation

Coffee break and informal discussions

- ❖ 16:30-17:30
  - Report from breakout groups and discussion
  - Conclusions and next steps

 Optional dinner

## DAY 4 – (20.09.2024)

### Informal trip to Fiesole, casual discussions and lunch

- ❖ 10:30 Meeting point at the Department of Earth Sciences in front of the dinosaur
- ❖ 10:30-12:30 Visit to Fiesole's Etruscan-Roman Archaeological area and walk around
- ❖ 12:30-14:30 Lunch



## Additional information

- Please note that coffee breaks, lunches and dinners are not included. Participants are free to choose among the nearby coffee bars and restaurants.
- Recommended places for lunch:
  - Ristorante SimBIOsi:** [Via de' Ginori, 58r/60r, 50123 Firenze FI, Italy.](#)  
Several options for pasta, pizza and salads.
  - All'Antico Vinaio:** [Via Ricasoli, 121r, 50121 Firenze FI, Italy](#)  
Sandwiches with different fillings