

MicroSoil 2019

Summer School*

**on “Elucidating microbial processes in soils and
sediments: Microscale measurements and modeling”**

**Château de Saint Loup sur Thouet
Saint Loup Lamairé, Deux Sèvres, France**

June 10-14, 2018.

* We know that technically, June 10-14 is in late Spring, not during the Summer... but “Late Spring School” does not sound good, plus it is generally warm enough in Saint Loup at that time of the year that attendees will forget that detail.

Program

Objectives: The foremost objectives of the Summer School are (1) to bring participants up on the state-of-the-art concerning the microscale analysis of the processes that control microbial activity in soils, and (2) to provide them with some of the key experimental and modelling skills that will enable them to carry out research programs in this area in the next few years. Another objective is to foster interactions and synergies among the different researchers in Europe, particularly, but also in other parts of the world, who work on the theme of the Summer School.

Monday June 10, 2019

Arrival of attendees in Poitiers in late afternoon/early evening,
Transfer by bus from train station to Saint Loup Lamairé. Departure of the bus from the station at 19:00.
Welcome cocktail upon arrival (around 20:00)

Tuesday June 11, 2019

8:00-9:00: Breakfast in the medieval tower of the château of Saint Loup.

9:00-9:30: Welcome and organizational aspects of Summer school

9:30-10:30: Lecture: “**Why do we need to study soils at the microscale: General context**”,
Philippe Baveye [40 min lecture + 20 min discussion]

10:30-10:45: Coffee break

10:45-11:30: Lecture: “**Emergent properties of microbial activity in heterogeneous soil microenvironments: General overview (Part 1)**”, Philippe Baveye [30 +15]*

11:30-12:15: Lecture: “**Emergent properties of microbial activity in heterogeneous soil microenvironments: General overview (Part 2)**”, Philippe Baveye [30 +15]

12:30-14:00: Lunch (cold buffet in the Orangerie, on the grounds of the château)

14:00-15:00: Lecture: “**The treatment and segmentation of X-ray CT images of soils: Overview**”, Steffen Schlüter [45 +15]

15:00-16:00: Lecture: “**Visualizing the spatial distribution of soil microorganisms using different microscopic techniques, including FISH**”, Philippe Baveye [45 +15]

16:00-16:20: Coffee break (+ posters)

* Cette présentation est basée en partie sur un article collectif récent par Baveye et al. (2018), et qui est disponible sur le site <https://www.frontiersin.org/articles/10.3389/fmicb.2018.01929/full>

16:20-17:20: Lecture: “**Where do we stand on modelling microscale processes in soils: An overview**”, Valérie Pot [45 +15]

17:20–17:45: **Open discussion**

17:45–18:30: Assistance available for those who have difficulties installing on their computers the software required for the next days’ sessions.

Evening: Dinner in the restaurant of the Hôtel Relais du Chapeau Rouge, in the town of Saint Loup

Wednesday June 12, 2019

8:00-9:00: Breakfast in the medieval tower of the château of Saint Loup sur Thouet.

9:00-10:00: Hands-on tutorial: “**The treatment and segmentation of X-ray CT images of soils (Part 1)**”, Steffen Schlüter

10:00-10:30: Skype session with Computer Tomography lab. Manager at University of Poitiers, to demonstrate the use of a CT scanner and some of the points to pay attention to

10:30-10:45: Coffee break (first chance to see posters of Poster session 2)

10:45-12:00: Hands-on tutorial: “**The treatment and segmentation of X-ray CT images of soils (Part 2)**”, Steffen Schlüter

12:30-14:00: Lunch (cold buffet in the Orangerie, on the grounds of the château)

14:00-15:20: Lecture: “**Submicron-scale imaging of soil organic matter dynamics using NanoSIMS: An overview (including Skype session with Dr. Carsten Muller at TU Munchen)**”, Alix Vidal [65 +15]

15:20-16:00: Hands-on tutorial: “**Submicron-scale imaging of soil organic matter dynamics using NanoSIMS (Part 1)**”, Alix Vidal

16:00-16:30: Coffee break (+ posters)

16:30-18:00: Hands-on tutorial: “**Submicron-scale imaging of soil organic matter dynamics using NanoSIMS (Part 2)**”, Alix Vidal

18:10-18:45: Poster session

Evening: Free evening. Attendees eat in one of the two local restaurants or car-pool with other participants to some of the restaurants in the area (in Parthenay or Airvault, accessible in 15 min).

Thursday June 13, 2019

8:00-9:00: Breakfast in the medieval tower of the château of Saint Loup sur Thouet.

9:00-10:30: Hands-on tutorial: **“Using FISH methods to quantify the spatial distribution of soil microorganisms (Part 1)”**, Philippe Baveye

10:30-10:45: Coffee break

10:45-12:00: Hands-on tutorial: **“Using FISH methods to quantify the spatial distribution of soil microorganisms (Part 2)”**, Philippe Baveye

12:30-14:00: Lunch (cold buffet in the Orangerie, on the grounds of the château)

14:00-16:00: Hands-on tutorial: **“Modelling microscale processes in soils with the Lattice-Boltzmann method (Part 1)”**, Valérie Pot

16:00-16:30: Coffee break (+ posters)

16:30-18:00: Hands-on tutorial: **“Modelling microscale processes in soils with the Lattice-Boltzmann method (Part 2)”**, Valérie Pot

18:10-18:45: Poster session

Evening: Festive dinner in the Orangerie, on the grounds of the château

Friday June 14, 2019

8:00-9:00: Breakfast in the medieval tower of the château of Saint Loup sur Thouet.

9:00-9:50: Tutorial clinic: Opportunity to ask additional questions about any of the tutorials.

9:50-10:30: **“Next frontier: What do we know about bacteriophages in soils and their effect on microbial processes?”**, Philippe Baveye [30 + 10]

10:30-10:45: Coffee break

10:45-11:20: **“Scaling up soil carbon dynamics from microbial cells to ecosystems and new macroscopic measurements”**, Short report of working group on upscaling, Wilfred Otten and Philippe Baveye [25 + 10]

11:20-11:45: **Concluding comments** discussion led by Philippe C. Baveye, Patricia Garnier and Naoise Nunan [35]

12:00 Departure by bus to Poitiers.