2023 INTP Autumn School: Syntheses in Theoretical Community Ecology

1 Overview

The 2nd INTP Autumn School "Syntheses in Theoretical Community Ecology" (http://intp.science/content/2023-autumn-school) will take place from **October 9 to 14, 2023** in Ariège, in the French Pyrenees. Its target is an interdisciplinary audience of researchers (including graduate, post-doctoral and early career) with strong prior experience in theoretical community ecology and modelling.

This thematic school aims to guide participants toward a more unified perspective on theory in community ecology. The program will be constructed jointly by the lecturers, revisiting a broad spectrum of topics from niches to networks and invasions, in order to emphasize the many explicit or hidden connections and tensions between leading theoretical approaches.

The goal is for each attendee to take a step back from their accumulated knowledge, and formulate a synthetic and critical viewpoint on the field's current state and open questions.

2 Dates and location

Application deadline: July 15
Selection: August 1

Dates: Monday October 9, 9:00 to Saturday October 14, 12:30 (arrival from Sunday 8, 16:00)

Location: The school will take place at the INTP campus (http://intp.science/escola/directions) in Surba, a small village in the French Pyrenees, accessible by train from Toulouse (international airport).

3 Fees

Total fees: **700 euros** covering tuition, scheduled activities, accommodation and (vegetarian) meals.

Participants lacking academic funding and facing financial difficulties may contact us to discuss the possibility of a scholarship covering these fees. In any case, participants are responsible for travel costs.

3.1 Additional activities

A local guide will offer mountaineering activities for an extra fee: **rock climbing, canyoning & via ferrata**. These planned activities will happen if enough participants register in advance.

Extra fees: 50 euros / 1 activity, 90 euros / 2 activities, 120 euros / 3 activites.

Alternatively, participants can self-organize to plan other activities (hiking, visiting prehistoric caves or neighboring cities, etc.)

4 Audience

The school is mainly intended for researchers (including graduate and post-doctoral) with prior experience in theoretical community ecology, complex systems and adjacent fields. Practical knowledge of modelling (e.g. dynamical models, numerical simulations) will be assumed. Applicants with interdisciplinary skills (e.g. physics or mathematics) fitting these criteria are especially welcome.

We encourage applications from any country and diverse personal backgrounds.

5 Application requirements

Applicants should submit the following documents before July 15th to contact@intp.science

- A current academic CV
- A short cover letter (maximum 1 page) detailing their background in community ecology, interest in the school, and if relevant, motive for asking a scholarship.

6 Program

Sunday: Arrival possible from 4pm.

Monday-Friday, Saturday morning:
9:00-12:30 Lectures
14:00-17:30 Free time & optional outdoors activities
18:00-19:30 Scientific activities (discussions, journal clubs, practical sessions)

6.1 Lecture plan

Invited seminars:

- **Mathew Leibold** (U Florida) A brief history of community ecology
- **Michel Loreau** (CNRS) Can theoretical ecology contribute to understanding and ovrecoming the current ecological crisis?

Lecturers: Guim Aguadé (U Montpellier), Jean-François Arnoldi (CNRS), Matthieu Barbier (CIRAD), Azenor Bideault (U Laval), Sébastien Ibanez (U Savoie Mont Blanc), Arnaud Sentis (INRAE), online seminar by Mathew Leibold (U Florida)

A tutorial comprised of preparatory reading and viewing materials (ecology & math prerequisites), prepared by Benjamin Girardot (INTP), will be sent to all participants a month in advance.

1. Introduction: Defragmenting ecology
2. Niches and fixed environmental effects
3. Vertical interactions, feedbacks and environment transformation
4. Horizontal interactions and coexistence
5. Multitrophic systems, pyramids and flows
6. Networks and structures

7. Multi-species dynamics, stability and collectivity
8. Stochasticity and high-dimensionality
9. Transients and historical contingency, invasions and radiation
10. Synthetic frameworks