ICTP SAIFR | International Centre for Theoretical Physics
South American Institute for Fundamental Research

Campus of IFT-UNESP – São Paulo, Brazil

January 18 – 28, 2027

THEORETICAL ECOLOGY AND THE PHYSICS OF LIFE: UPSCALING BIODIVERSITY IN A CHANGING WORLD

ANGEL SEGURA
CURE, Uruguay
Macroecology of species fluctuations and extinctions in marine organisms

VIVIANE OLIVEIRA
UFRPE, Brazil
Ecological modeling: Habitat fragmentation and evolutionary rescue

FABIANA LAGUNA
CNEA, Argentina
Modeling Ecological Dynamics Across Scales: From Individuals to Metapopulations

THORSTEN WIEGAND
UFZ, Germany
Spatial upscaling of community dynamics from the plant neighborhood scale to the community scale

JACOPO GRILLI
ICTP, Italy
Microbial Ecology

RICARDO MARTINEZ-GARCIA
CASUS-HZDR, Germany, & ICTP-SAIFR, Brazil

PABLO MARQUET
PUC, Chile, & Santa Fe, USA

The growing complexity of ecological data demands a shared language and robust methodologies to describe, understand, and predict ecological dynamics. In this context, the framework of complex systems provides an integrative foundation that is both aligned with the challenges of biological data and is deeply interdisciplinary. This school and workshop will focus on how the intersections of physics, applied mathematics, and ecology are and will be used to address complex ecological phenomena and biodiversity challenges around the world.

To foster scientific collaboration, the event incorporates a two-day workshop as a platform to connect early-career and senior scientists across the region. The workshop will feature invited and contributed talks, extended poster sessions, and a round table on the future of theoretical ecology in South America. Dedicated networking sessions will provide a space to brainstorm collaborative projects and outline joint research priorities for the coming years.

During the school, students will learn some fundamental computational and analytical tools needed to formulate, analyze, and integrate mathematical models with empirical data. The curriculum covers a wide range of modeling approaches, including individual-based models, differential equations, and stochastic dynamics embedded in complex interaction networks.

The school is primarily aimed at master's and Ph.D. students in the life sciences, mathematics, and physics, though highly motivated students at the end of their undergraduate studies and postdoctoral researchers are also welcome to apply. We strive to create a diverse environment in which students with distinct backgrounds are welcome. In particular, we actively invite emerging and established scientists from across South America, and participants are highly encouraged to submit an abstract for a poster presentation or a contributed short talk to highlight their research and spark new collaborations.

School application deadline:
October 20, 2026

Workshop application deadline:
November 20, 2026

Online application and more information:
ictp-saifr.org/tepl2027

ICTP SAIFR · FAPESP · ICTP · unesp · IFT-UNESP · serrapilheira

ORGANIZERS

Rafael Menezes
ICTP-SAIFR / IFT-Unesp, Brazil

Paula Lemos-Costa
USP, Brazil

Marcus Aguiar
Unicamp, Brazil

Silvina Ponce Dawson
UBA, Argentina

ICTP-SAIFR STEERING COMMITTEE
Atish Dabholkar (chair, ICTP director)
Maysa Furlan (UNESP rector)
Hugo Aguilaniu (Serrapilheira president-director)
Helena Nader (Brazilian Academy of Sciences president)
Juan Maldacena (South American representative)

ICTP-SAIFR SCIENTIFIC COUNCIL
Carlos Brito Cruz (chair, Elsevier)
Rosario Fazio (ICTP)
Alexandre Reily Rocha (IFT-UNESP)
William Bialek (Princeton Univ.)
Eduardo Fradkin (Univ. of Illinois)
Gabriela Gonzalez (Louisiana State Univ.)
André de Gouvêa (Northwestern Univ.)
Zvi Bern (UCLA)
Leticia Cugliandolo (Sorbonne Univ.)
Luis Lehner (Perimeter Inst.)

ICTP-SAIFR STAFF
Nathan Berkovits (Director)
Dario Rosa (Vice-Director)
Pedro Vieira (Perimeter-SAIFR Coordinator)
William Santos (Visitors Coordinator)
Bruna Cassettari (Activities Coordinator)
Humberto Neto (Executive Secretary)
Luiz Eduardo Moreira (Computer Systems Manager)
Lilia Faria (Financial Manager)
Marrey Peres, Jr. (Operations Manager)
Thiago Codinhoto (Technical Assistant)
Rebeca Doi (Technical Assistant)
Marcelo Sime (Technical Assistant)
Kalianny Bezerra (Communications Coordinator)