



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

Campus of IFT-UNESP – São Paulo, Brazil



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February 3 – 14, 2025

**SCHOOL ON
 SYNCHRONIZATION:
 FROM COLLECTIVE
 MOTION TO BRAIN
 DYNAMICS**



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Synchronization is one of the fundamental phenomena in complex systems and nonlinear dynamics. There are a large number of systems where synchronization is an important effect and we shall focus on two of them: a) mobile systems: the emergence of coordinated movement in space and time without an apparent controller; b) the Janus-faced nature of synchronization in brain dynamics, or how synchronization impairs and drives the brain, and the importance of physics for the prediction of epileptic seizures.

The school will cover: a general introduction to synchronization phenomena; systems where spatial and temporal synchronization occur simultaneously, as observed in sperm cells, starfish embryos and swarmalators in general; introduction to epilepsy and seizure dynamics; seizure prediction methods: modern nonlinear models for the detection and forecasting of dynamical transitions from time series; challenges and opportunities for more efficient data analysis.

The event will also include a workshop on the weekend of February 8-9 covering current research in the field.

This school is part of the Topics in Nonlinear Science: Fundamentals and Applications.

There is no registration fee and limited funds are available for travel and local expenses.

**Application deadline (school):
 November 23, 2024**

**Registration deadline (workshop):
 December 14, 2024**

**More information:
ictp-saifr.org/sscmbd2025**



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