



ICTP
SAIFR

International Centre for Theoretical Physics
South American Institute for Fundamental Research

Campus of IFT-UNESP - São Paulo, Brasil

May 22-26, 2023

**SCHOOL ON NONLINEAR
DYNAMICS, COMPLEX
NETWORKS, INFORMATION
THEORY AND MACHINE
LEARNING IN NEUROSCIENCE**



ANA AMADOR

U. de Buenos Aires, Argentina

Nonlinear dynamics of neuronal models with applications to bird song dynamics



JESÚS GOMEZ-GARDEÑES

U. de Zaragoza, Spain

Complex networks and applications to neuroscience



CRISTINA MASOLLER

U. Politecnica de Catalunya, Spain

Time series analysis tools with applications to neuroscience



JORDI SORIANO

U. de Barcelona, Spain

Structure-to-function relationship in neuronal cultures: applications to biological machine learning and reservoir computing



OSVALDO A. ROSSO

U. Federal de Alagoas, Brazil

Information theory tools for neuroscience applications

To better understand complex phenomena in neuroscience that occur at a wide range of scales (from the dynamics of single neurons in vitro neuronal cultures to the whole brain), appropriate models, experimental techniques and data analysis techniques are needed.

This school for PhD students and young postdocs will focus on five main areas: nonlinear dynamics, complex networks, data analysis, information theory and machine learning. The school will cover fundamental and applied aspects such as excitability and neuronal dynamics, neural coding, entropy and complexity measures, machine learning and data analysis methods for inferring functional connectivity, methods for characterizing functional networks, etc.

A "student's presentation" session will be organized on Monday afternoon, where participants will have 3 min to present themselves and explain their research topic. At the end of the school, participants will present group projects based on the tools learned in the school. Besides the lectures, tutored sessions and discussions will be organized to help participants with the development of the group projects.

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

Application deadline: March 19, 2023

Online application and more information:

www.ictp-saifr.org/nld2023/



ORGANIZERS

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