

WORKSHOP

Complex Systems: from Physics to Biomedicine

in honor of **Giorgio Parisi**
Nobel Laureate for Physics 2021

May 10th 2022

TEATRO DI VILLA TORLONIA
Via L. Spallanzani 1, Rome

Organizing Committee:

Lilia Alberghina and **Riccardo Zecchina**



ACCADEMIA NAZIONALE
DELLE SCIENZE DETTA DEI XL

The need to develop new approaches to investigate the complexity of natural and man-made systems is one of the main scientific themes of present time and may offer new ways to cope with urgent social and economic challenges.

A strong integration of experimental life sciences and computational sciences is required for a better understanding of biological complexity. Since the main objective is the recognition of the hidden patterns that govern complex physiological or pathological processes, the construction of predictive mathematical models is required. It will be supported by machine learning algorithms, able to account for molecular organized complexity of living systems. Contributions on the development of required computational approaches in these areas will be welcome.

PRELIMINARY PROGRAMME

9:15	Opening Corrado De Concini , President Accademia Nazionale delle Scienze detta dei XL
09:40	Complex systems: from a physicist viewpoint Giorgio Parisi , Sapienza University of Rome
10:20	Systems Metabolomics to investigate the complexity of metabolism as driver of cancer. Lilia Alberghina , University of Milano Bicocca
11:00	<i>Coffee break</i>
11:30	Intelligent Artificial Intelligence for Health: from new thermodynamics to a fundamentally different approach to network diseases Hans V. Westerhoff , University of Amsterdam
12:10	From Single-Cell to Multi-Cells Information Systems Analysis Barbara Di Camillo , University of Padova
12:50	Generative and interpretable models for aptamer design and analysis of in vitro sequence selection Rémi Monasson , École Normale Supérieure, Paris
13:30 -14:30	<i>Lunch break</i>
14:30 -17:30	Short communications session
17:30	Final discussion on future perspectives chaired by Riccardo Zecchina
18.30	Closing of the meeting