

The First Conference of the Italian Network for Computational Neuroscience (INCN)

Rome, September 23-25, 2024

co-organized by

ISTITUTO SUPERIORE DI SANITÀ

Centro nazionale per la Protezione dalle Radiazioni e Fisica Computazionale
(National Center for Radiation Protection and Computational Physics,
PRORA)

and

Università degli Studi di Genova

N° ID: 128D24_P

Summary:

The First Conference of the Italian Network for Computational Neuroscience (INCN) will be held from September 23rd to 25th, 2024 at the Istituto Superiore di Sanità (Italian National Institute of Health, ISS) in Rome. The conference aims to establish a collaborative network in Italy to exchange information and coordinate activities in computational neuroscience. Keynote speakers include Stefano Fusi, Stefano Panzeri, and Valerio Mante. The event will cover six macro-topics: Cognitive Neuroscience, Computational Neuroscience, Mathematical Neuroscience, Neuroengineering, Statistical Physics, and Systems Neuroscience.

Attendees will have the opportunity to connect with professionals, present their work in a poster session, and attend 30 engaging lectures by leading experts.

Aims:

The aim of this First Conference is to create a fertile environment to foster the next generation of young researchers, share relevant information and scientific advances. By bringing together the Italian community of computational neuroscience, more effective actions can be planned to increase its visibility and consolidate scientific exchanges with other relevant communities.

PROGRAMME

MONDAY, SEPTEMBER 23

8:30 Registration

8:45 Welcome
Maurizio Mattia, National Center for Radiation Protection and Computational Physics, ISS

COMPUTATIONAL NEUROSCIENCE I Chairman: **Andrea Galluzzi**

9:00 *The EBRAINS-Italy Research Infrastructure for Neuroscience Research*
Michele Migliore

9:30 *A geometric neural principle for serial ordering*
Maurizio Mattia

10:00 *Computational Neuroengineering for Parkinson's Disease*
Alberto Mazzoni

10:30 Coffee break

MATHEMATICAL NEUROSCIENCE Chairman: **Andrea Galluzzi**

11:00 *From single neuron to networks mathematical models*
Laura Sacerdote

11:30 *Does Pavlov Classical Conditioning imply Hebb's learning rule?*
Adriano Barra

12:00 *Networks of neural networks: the more is different*
Elena Agliari

12:30 Lunch break - Poster session

KEYNOTE SPEAKER TALK

13:30 *The geometry of abstraction in human and non-human primates*
Stefano Fusi

NEUROENGINEERING I

14:30 *Advanced neurotechnologies for the restoration of motor function*
Alessandra Pedrocchi

15:00 *'Broadband' cortical neuronal ensembles*
Michele Giugliano

15:30 Coffee break

NEUROENGINEERING II

Chairman: **Gianni Vinci**

16:00 *Towards personalized neuroengineering solutions to treat brain lesions*
Michela Chiappalone

16:30 *When computational neuroscience becomes computational neuroengineering
(and vice versa)*
Paolo Massobrio

17:00 Poster session

17:30 End of work

TUESDAY, SEPTEMBER 24

STATISTICAL PHYSICS I

Chairman: **Gianni Vinci**

9:00 *Recurrent Neural Networks for Inference of Population Dynamics in Cortical Circuits*
Raffaella Burioni

9:30 *Spontaneous vs. stimulated brain activity: A statistical physics approach*
Lucilla De Arcangelis

10:00 *Daydreaming Hopfield Networks and their surprising effectiveness on correlated data*
Federico Ricci-Tersenghi

10:30 Coffee break

SYSTEM NEUROSCIENCE

Chairman: **Gianni Vinci**

11:00 *Dynamic information handling includes neural activity modulation in the frontal areas*
Stefano Ferraina

11:30 *Beyond parallel fiber LTD: the diversity of synaptic and non-synaptic plasticity in the cerebellum*
Egidio D'Angelo

12:00 *Glial place cells: complementary encoding of spatial information in hippocampal astrocytes*
Tommaso Fellin

12:30 Lunch break - Poster session

KEYNOTE SPEAKER TALK

13:30 *Characterizing how neural population codes transmit information downstream*
Stefano Panzeri

COMPUTATIONAL NEUROSCIENCE II

Chairman: **Andrea Galluzzi**

14:30 *Next generation neural mass models: short-term synaptic plasticity vs spike frequency adaptation*
Simona Olmi

15:00 *Brain state specific apical mechanisms for incremental learning and sleep and the cobrawap pipeline*
Pier S. Paolucci

15:30 Coffee break

COMPUTATIONAL NEUROSCIENCE III

Chairman: **Andrea Galluzzi**

16:00 *Brain and criticality. A contribution from modelling and monkey in vivo data*
Antonio Pazienti

16:30 *Diverse perceptual biases emerge from Hebbian plasticity in a recurrent neural network model*
Sebastian Goldt

17:00 Round table: the Italian Network for Computational Neuroscience (INCN)

17:30 End of work

20:30 Social dinner

WEDNESDAY, SEPTEMBER 25

COGNITIVE NEUROSCIENCE

Chairman: **Gianni Vinci**

9:00 *Modeling visual perception in rodents using deep convolutional neural networks*
Davide Zoccolan

9:30 *Neurocognitive modeling with energy-based deep generative models*
Marco Zorzi

10:00 *Embodied decision-making and planning*
Giovanni Pezzulo

10:30 Coffee break

STATISTICAL PHYSICS II

Chairman: **Andrea Galluzzi**

11:00 *Improving the Hopfield like approach*
Enzo Marinari

11:30 *Simple models for neural activity at criticality*
Samir Suweis

12:00 *Inverse statistical problems: from the inverse Ising problem to data science*
Riccardo Zecchina

12:30 Lunch break - Poster session

KEYNOTE SPEAKER TALK

13:30 *A dynamical systems view on multi-area neural computations*
Valerio Mante

COMPUTATIONAL NEUROSCIENCE IV

Chairman: **Gianni Vinci**

14:30 *Integration of rate and phase codes by hippocampal cell-assemblies supports flexible encoding of spatiotemporal context*
Eleonora Russo

15:00 *Connectome-based models of feature selectivity in a cortical circuit*
Alessandro Sanzeni

15:30 Coffee break

COMPUTATIONAL NEUROSCIENCE V

Chairman: **Gianni Vinci**

16:00 *Memories reservoir and criticality in a spiking modular neural network*
Silvia Scarpetta

16:30 *Behavioral state and stimulus strength regulate the role of somatostatin interneurons in stabilizing cortical network activity*
Nicolas Brunel

17:00 Concluding remarks

17:30 End of work

Keynote Speakers

Stefano Fusi, Columbia University, New York (USA)

Stefano Panzeri, University Hospital Hamburg Eppendorf, Hamburg (Germany)

Valerio Mante, Federal Technology Zurich, Zurich (Switzerland)

Speakers and Chairpersons

Agliari Elena, Sapienza University of Rome

Barra Adriano, Sapienza University of Rome

Brunel Nicolas, Bocconi University, Milan

Burioni Raffaella, University of Parma

Chiappalone Michela, University of Genoa

De Arcangelis Lucilla, University of Campania "Luigi Vanvitelli", Naples

Fellin Tommaso, Italian Institute of Technology, Genoa

Ferraina Stefano, Sapienza University of Rome

Galluzzi Andrea, National Center for Radiation Protection and Computational Physics (PRORA), ISS, Rome

Giugliano Michele, University of Modena and Reggio Emilia, Modena

Goldt Sebastian,	International School of Advanced Studies, Trieste
Marinari Enzo,	Sapienza University of Rome
Mattia Maurizio,	National Center for Radiation Protection and Computational Physics (PRORA), ISS, Rome
Mazzoni Alberto,	The Biorobotics Institute, Sant'Anna School of Advanced Studies, Pisa
Migliore Michele,	Institute of Biophysics, National Research Council, Palermo
Olmi Simona,	Institute of Complex Systems, National Research Council, Florence
Pazienti Antonio,	National Center for Radiation Protection and Computational Physics (PRORA), ISS, Rome
Paolucci Pier Stanislao,	National Institute of Nuclear Physics, Rome
Pezzulo Giovanni,	National Research Council, Rome
Ricci Tersenghi Federico,	Sapienza University of Rome
Russo Eleonora,	Sant'Anna School of Advanced Studies, Pisa
Sacerdote Laura Lea,	Department of Mathematics 'G.Peano', University of Turin
Sanzeni Alessandro,	Bocconi University, Milan
Scarpetta Silvia,	Department of Physics, University of Salerno
Suweis Samir,	University of Padova
Vinci Gianni Valerio,	National Center for Radiation Protection and Computational Physics (PRORA), ISS, Rome
Zecchina Riccardo,	Bocconi University, Milan
Zoccolan Davide,	International School For Advanced Studies, Trieste
Zorzi Marco,	University of Padova

Scientific coordinators of the event

Nicolas Brunel,	Bocconi University, Milan
Sergio Martinoia,	University of Genoa
Maurizio Mattia,	National Center for Radiation Protection and Computational Physics (PRORA), ISS, Rome

Scientific Secretariat

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GENERAL INFORMATION

Conference venue: Istituto Superiore di Sanità, Aula Pocchiari - Viale Regina Elena 299, Rome
([How to reach us](#) | [INCN](#))

Official language

The official language of the event is **English**. Simultaneous translation will not be available.

Target audience

Physicists, mathematicians, doctors, biologists, engineers, computer scientists, National Health Service professionals, students.

Maximum number of attendants: 150

Registration and selection

Attendants are kindly requested to fill out the registration form available online at the following link [Registration | INCN](#) by **September 14, 2024**.

Applications will be accepted until all places are filled, priority will be given to poster presenters. Only those who receive communication by September 17 are intended to be admitted to participate. Actual participation will be detected through entry and exit registration.

Registration fee 50 euro. The registration fee includes:

- Access to the event for all the days of the Workshop
- Congress kit
- Access to the Round Table on Tuesday 24th
- Possibility to present your work in poster sessions
- 2 coffee breaks each day
- Lunch each day

Payment method

Bank transfer. Given the limited availability of seats, the details for the payment of the fee will be shared following the acceptance of the registration

Abstracts and poster session

Abstract Form and Guidelines: [Registration | INCN](#)

Abstract Submission Deadline: **September 14th, 2024**

Notification of Abstract Acceptance: **September 20th, 2024**

Certificates

A Certificate of attendance will be provided to those who have attended at least 75% of the event.

This event does not provide any CME credits.

For any further information about the conference, please contact the Organizing Secretariat.

[Firma elettronica del Legale Rappresentante]

