RESEARCH AREA

NEUROSCIENCE

ma per seguir virtute e canoscenza

SISSA

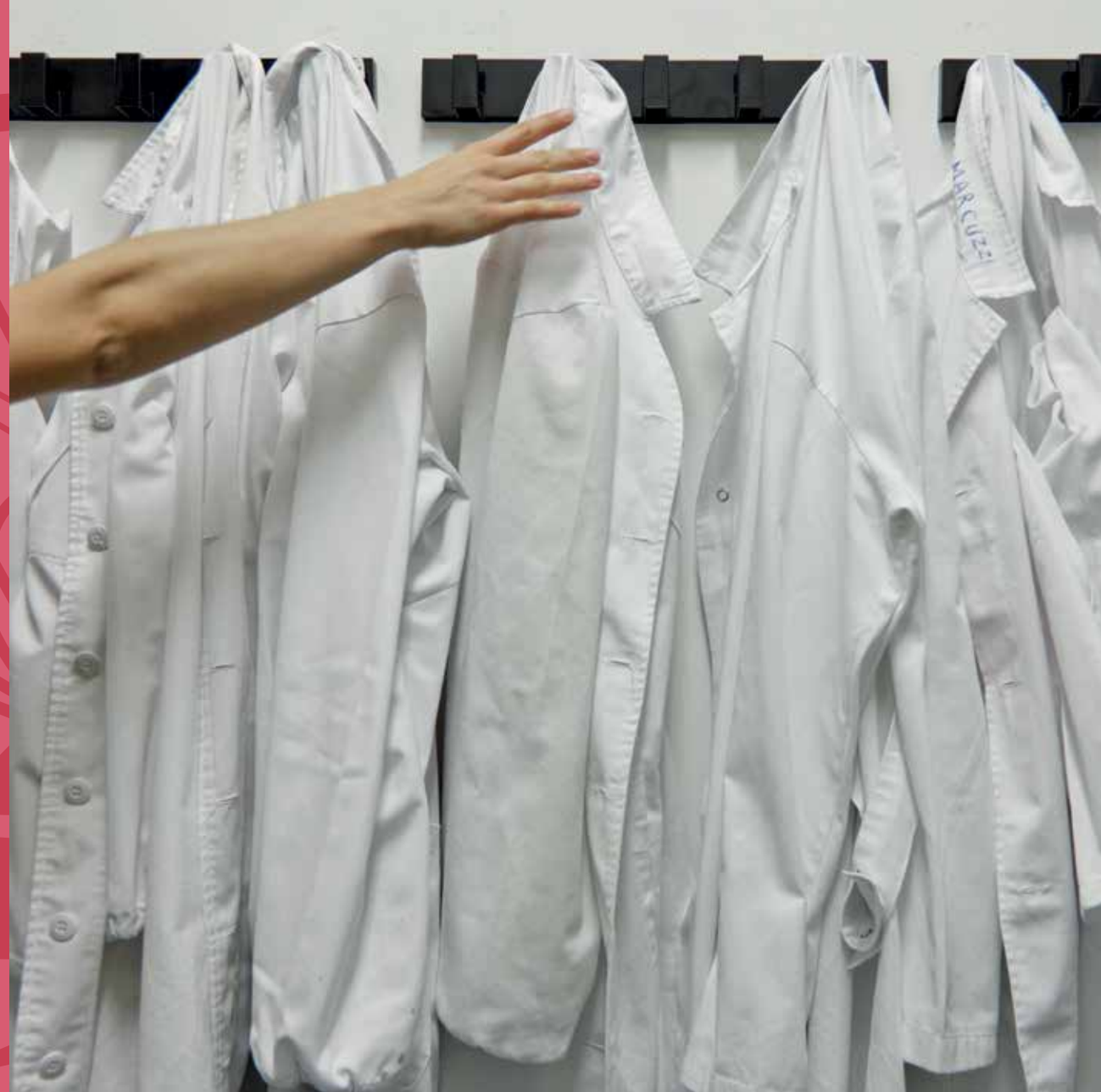
RESEARCH AREA NEUROSCIENCE

COORDINATOR
MATHEW E. DIAMOND

AREA COMMITTEE
Alessandro Treves
Raffaella Rumiati
Giuseppe Legname
Andrea Nistri
Dario Olivieri

A variety of research groups are active in Neuroscience. These include **Cognitive Neuroscience**, which is aimed at understanding how the brain produces behaviour, **Genomics**, which is aimed at determining how the structure and function of genomes contribute to the normal and pathological state of the brain, and **Neurobiology**, which investigates the molecular, cellular and integrative mechanisms at work in the nervous system.

Together with the International Centre for Genetic Engineering and Biotechnology (ICGEB), the University of Trieste and the University of Udine, SISSA has launched a new initiative, the **Joint PhD Programme in Molecular Biology (JuMBO)**, to study the molecular basis of living cells and organisms in health and disease.



RESEARCH AREA NEUROSCIENCE

COGNITIVE NEUROSCIENCE

COORDINATOR RAFFAELLA RUMIATI

Cognitive Neuroscience focuses on functions expressed by an entire system, where the system be a baby learning to speak or a population of neurons storing a new memory. Strategies ranging from the recording of single-neuron activity, to imaging of the whole brain, to the analysis of mathematical models all contribute to the same goal. In short, the aim of cognitive neuroscience is to understand how neurons and neuronal systems work together to produce behaviour.

Like all other PhD programmes at SISSA, the **Cognitive Neuroscience PhD** is carried out entirely in English and caters to students from all over the world. In a typical year, more than 50% of the students join the programme from outside Italy. After 6 months of courses (consisting of 3 modules: core concepts, advanced topics, and methodologies) the students dedicate themselves to an original research project in close collaboration with their faculty advisor.

The main research lines can be deduced from the names of our laboratories:

- Cognitive Neuropsychology and Brain Imaging Lab
- Language, Cognition and Development Lab
- Tactile Perception and Learning Lab
- LIMBO - Liminar Investigations in Memory and Brain Organization
- Visual Perception Neuroscience Lab
- Collective Emotions and Social Cognitive Neuroscience Lab
- Social Cognition & Integrative Neuroscience (SCIN) Lab

The most recent placements after PhD at SISSA:

Harvard University, Cambridge, USA
Princeton University, Princeton, USA
Norwegian University for Science and Technology, Trondheim, Norway
Glasgow University, Glasgow, Scotland, UK
Manchester University, Manchester, UK
Université de Genève, Switzerland
University of Southern California, Los Angeles, USA
Radboud University Nijmegen, The Netherlands
Sydney University, Sydney, Australia

Additional information about the courses and the research activity can be found at:
www.sissa.it/cns
Info: **phd@sissa.it**

Short fellowships may be awarded to candidates taking the entrance exam.
These fellowships cover travel and accommodation expenses and entitle students to visit the school before the selection.

RESEARCH AREA NEUROSCIENCE

FUNCTIONAL AND STRUCTURAL GENOMICS

COORDINATOR GIUSEPPE LEGNAME

The main mission of the PhD course in **Structural and Functional Genomics** is to train enthusiastic young scientists by addressing their interests in a broad spectrum of **biological research disciplines**.

Projects within the **PhD programme** range from genomics, transcriptomics and developmental genetics to structural biology, molecular mechanisms of neurodegeneration and developmental neurobiology. Crossing over research such as system biology may have a prominent role within the PhD programme. Students are continuously in touch with **cutting-edge research** by attending classes, seminars and workshops throughout the year. The average teacher-student ratio is about 1 to 5.

The main research interests include:

- Functional Genomics of the Brain
- Developmental Genomics
- Systems Biology
- Nanotechnology for Biological Sciences
- Structural Biology of Prion Protein
- Structural Biology of DNA Replication
- Molecular Mechanisms of Neurodegeneration
- Synthetic Prions
- Molecular Physiology
- Drug Discovery

The most recent placements after PhD at SISSA:

Northwestern University, Chicago, USA
UCSF Medical Center, San Francisco, USA
VIB Center for the Biology of Disease, KU Leuven, Belgium
Universidad Autonoma de Madrid, Madrid, Spain
National Institute of Chemistry, Ljubljana, Slovenia

Additional information about the courses and the research activity can be found at:
www.sissa.it/phdgenomics
Info: **phd@sissa.it**

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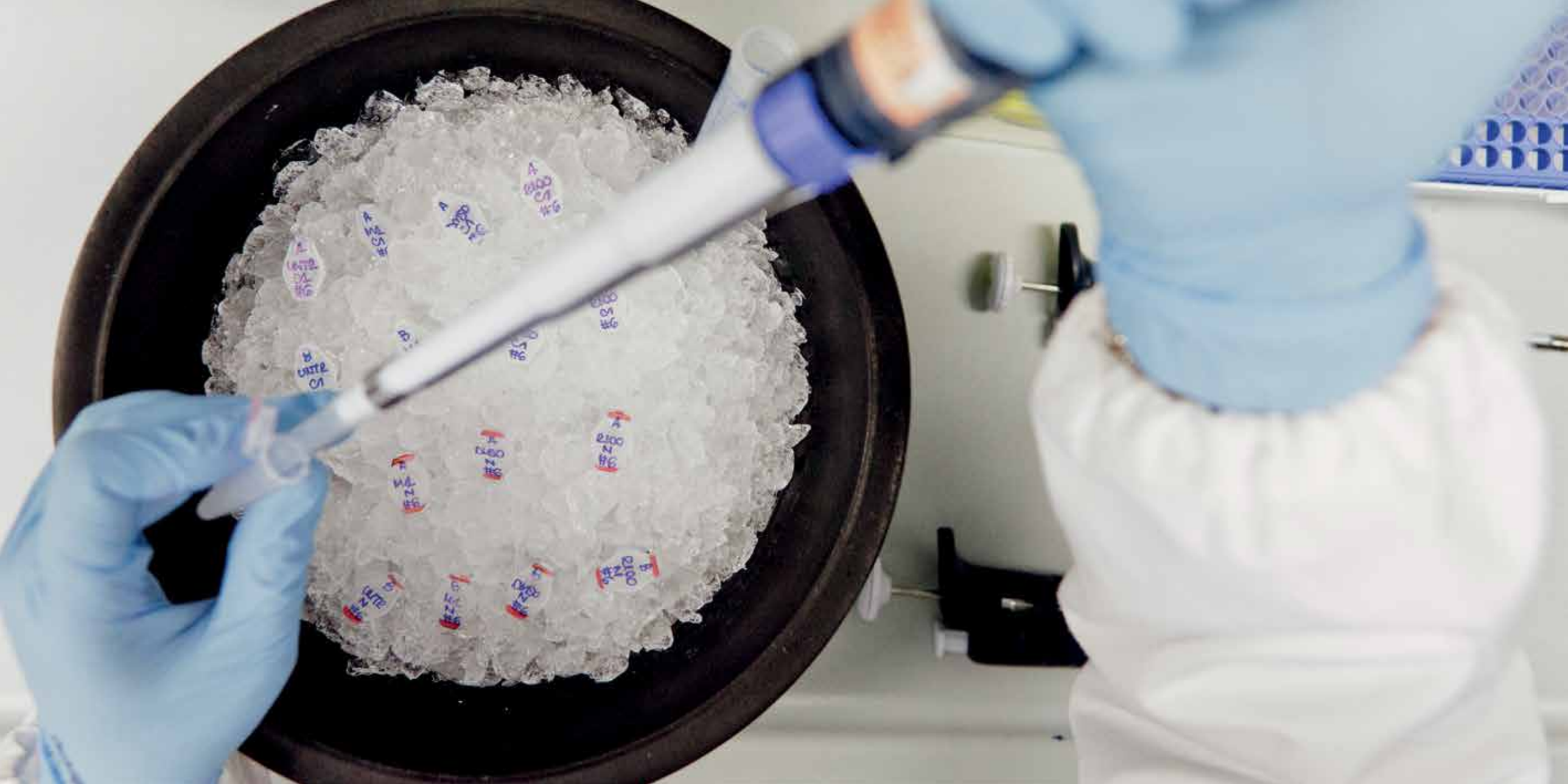

RESEARCH AREA NEUROSCIENCE

NEUROBIOLOGY

COORDINATOR VINCENT TORRE

The **Neurobiology PhD course** has fellowships available for training and research in **molecular, cellular and systems neuroscience**.

Neurobiologists seek to explain the underlying processes that ultimately account for behaviour and for its dysfunction at the level of molecules, cells, networks and integrated systems. To carry out such complex studies, a variety of **experimental approaches** and **scientific disciplines** are required, ranging from mathematics and physics to biology.

Tuition starts in November and is organized in courses and seminars held by the teaching staff and by external lecturers, together with a series of methods courses to introduce students to the techniques applied in current research.

Main research lines:

- Bionanotechnology and Neuroscience
- Spinal cord: circuits and regeneration
- Ion channels in health and disease
- Synaptic Plasticity
- Advanced imaging
- Sensory Systems

The most recent placements after PhD at SISSA:

University College London, London, UK
CNRS, France
Baylor College of Medicine, Huston, USA
Monell Chemical Senses Center, Karolinska Institutet Solna,Sweden
Universität Heidelberg, Heidelberg, Germany
Columbia University, New York, USA
University of British Columbia, Vancouver, Canada
Max Delbrück Center for Molecular Medicine, Berlin, Germany

Additional information about the courses and the research activity can be found at:
www.sissa.it/nb
Info: **phd@sissa.it**

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RESEARCH AREA NEUROSCIENCE

THE JOINT PHD PROGRAMME IN MOLECULAR BIOLOGY

COORDINATOR STEFANO GUSTINCICH

This new initiative involves the International Centre for Genetic Engineering & Biotechnology (ICGEB), the University of Trieste and the University of Udine to offer a unique combination of expertise to address fundamental questions on the molecular basis of cells, tissues and organisms in health and disease.

The main mission of **The Joint PhD Programme in Molecular Biology (JuMBO)** is to train enthusiastic young scientists to be active participants in these exciting times in contemporary biology. The enormous amount of data provided by large genomic projects must be integrated into accepted knowledge of how molecules interact to build up complex living organisms. Unexpected molecular richness leads to new theoretical and experimental challenges in molecular biology and impacts our understanding of complex diseases, potentially providing new tools for therapy.

The course consists of two parts: a **theoretical introduction to molecular biology** and an **experimental project** to be carried out in one of the affiliated **laboratories**. Advanced and parallel teaching will be organized in courses, thematic workshops and individual seminars. Progress will be monitored at the end of each year with a seminar in front of all the JuMBO faculties. All activities will be carried out in English.

The main research interests include:

- Molecular Biology of Cells
- Developmental Biology
- Plant biology
- Structural Biology of Proteins and Nucleic Acids
- Genomics
- Molecular Oncology
- Molecular Cardiology
- Molecular Mechanisms of Neurodegeneration
- Molecular Virology
- RNA therapeutics
- Drug Discovery
- DNA Damage

Additional information about the courses and the research activity can be found at:
www.sissa.it/joint-phd-program-molecular-biology
Info: **phd@sissa.it**

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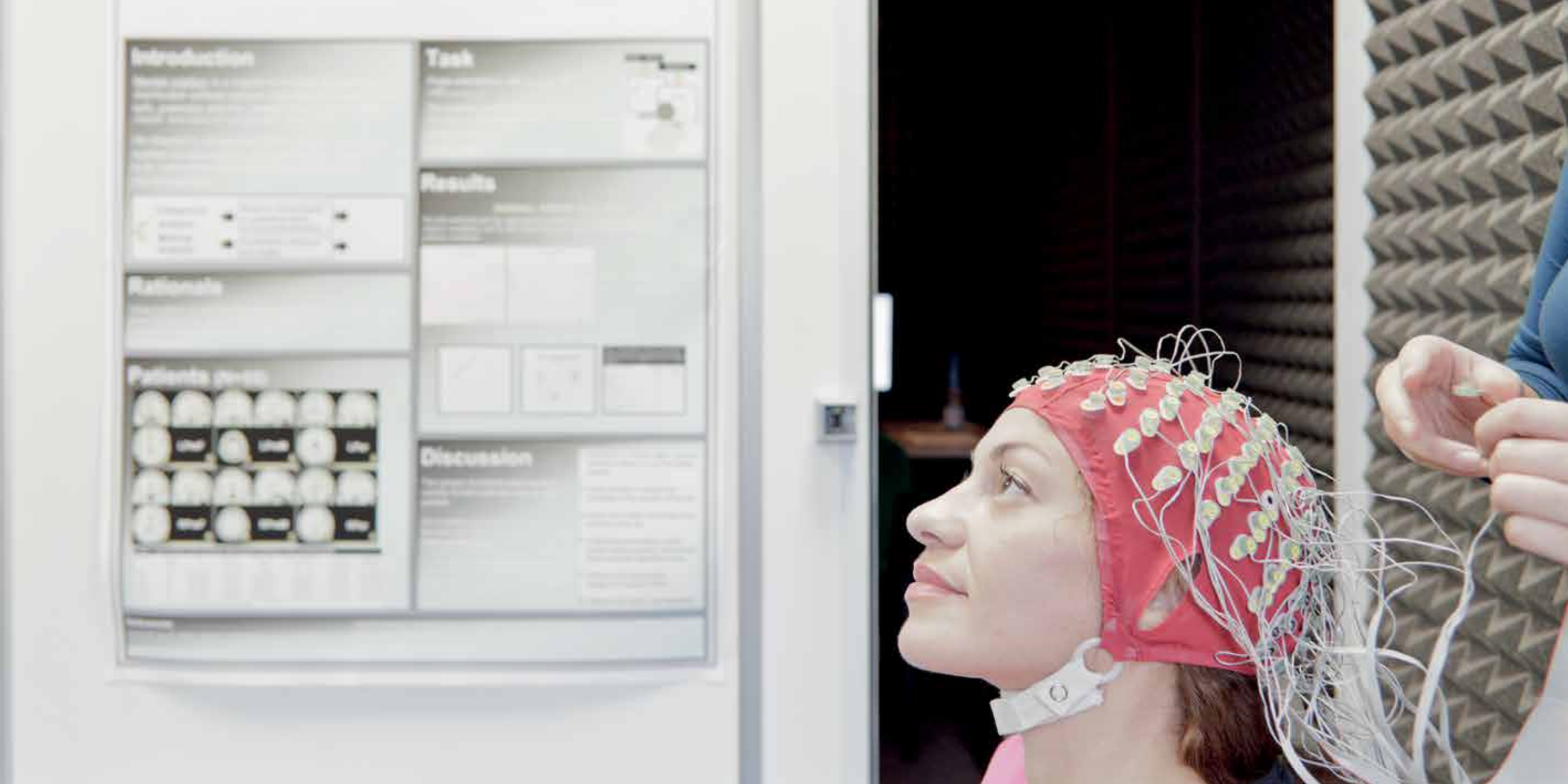
Introduction
Task
Results
Discussion

More information www.sissa.it

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