



## GENERAL INFORMATION

### The Graduate Training Centre of Neuroscience

At the University of Tübingen, three international neuroscience graduate schools provide research oriented career tracks that lead to a master and, eventually, a doctoral degree and provide an ideal preparation for a career in science and academia. The three graduate programs complement one another ideally and, thus, provide a markedly broad spectrum of neuroscience research and training opportunities in Tübingen. Teaching is entirely in English.

In a recent international student survey (isb) the Tübingen Graduate Schools were ranked 1<sup>st</sup> place in the category **'student support'** amongst all international and German universities.

### Participating Institutions

A large international faculty of renowned scientists together with state-of-the-art facilities provide an outstanding environment for interdisciplinary research and training in neuroscience. Participating institutions include:

- Univ. of Tübingen - Faculty of Science and Faculty of Medicine
- Werner Reichardt Centre for Integrative Neuroscience
- Hertie-Institute for Clinical Brain Research
- German Centre for Neurodegenerative Diseases – Tübingen
- Bernstein Centre for Computational Neuroscience – Tübingen
- Centre for Neurosensory Systems
- Natural & Medical Sciences Institute at the Univ. of Tübingen
- Max-Planck-Institute for Biological Cybernetics
- Max-Planck-Institute for Intelligent Systems

### Application – Scholarships – Fees

- Entry requirements: BSc for master program; MSc or MD for doctoral program.
- Application deadlines: January 15 for master programs. Doctoral students may apply throughout the year.
- The selection procedure for a place on a master program is three stepped: (1) online application, (2) subject test, (3) interview. Students interested in a doctoral project may contact research groups of their interest directly.
- Scholarships are available for excellent international students. Doctoral students are generally funded through research grants.
- Tuition fees do not apply. A moderate matriculation fee has to be paid per term.

## THE CITY

Tübingen is situated in the southwest of Germany, on the Neckar River and in the foothills of the Swabian Jura and the Black Forest. In the old centre of Tübingen, unique ensembles of historic half-timbered houses dating from the late 15<sup>th</sup> to the early 16<sup>th</sup> century attract many visitors every year. Tübingen also offers a rich array of cultural activities all year round. There are parks, gardens, and forested areas to explore by foot or bicycle. With its scenic geographical setting, lively local culture and extensive green space, Tübingen offers its residents an excellent quality of life.



## THE UNIVERSITY

Founded in 1477, the University of Tübingen is a prime location for academic studies and research. A full range of disciplines and a high standard of research, both in the sciences and the humanities, contribute to its international reputation. The University offers a wide range of cross-disciplinary events and sponsors many cultural highlights in the city. Today 28,500 students – 13% of whom are international students – are enrolled in approximately 60 courses.

## CONTACT

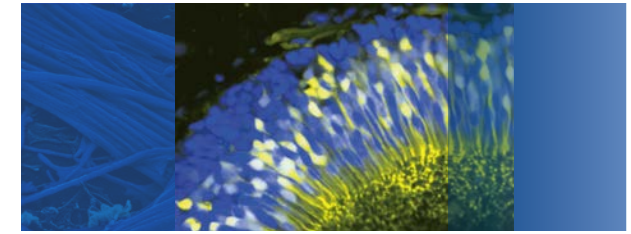
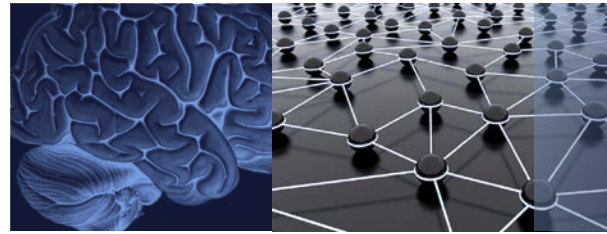
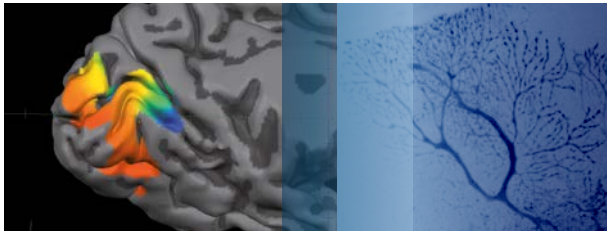
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## GRADUATE TRAINING CENTRE OF NEUROSCIENCE

## International Max Planck Research School



## International Max Planck Research School of Cognitive and Systems Neuroscience

### GRADUATE SCHOOL OF NEURAL & BEHAVIOURAL SCIENCES

#### Area of Study and Research

The Graduate School of Neural & Behavioural Sciences provides research-oriented training in systems, behavioural and cognitive neuroscience. A major aim of this research is to understand the role of higher brain functions that allow humans and animals to operate successfully in natural environments. Concrete topics include the neuronal basis of perception and its top-down control by attention, expectation and motivation. Furthermore, spatial orientation, planning and execution of movements, storage and retrieval of memories, processing of language and communication are being investigated. Also, the development of neuroprosthetic devices that may take over functions of receptors or neuronal networks destroyed by disease is being pursued. To investigate these scientific questions, a wide, interdisciplinary spectrum of methods is employed. Of particular importance are brain imaging methods, both with respect to their physiological and technological basis and their application in neurology, psychiatry and neurocognition.

#### Teaching Program – Curricular Focus

- functional neuroanatomy
- computational neuroscience
- behavioural neuropharmacology
- mechanisms of learning and memory
- neurophysiology and neuropsychology
- motor and sensory systems neuroscience
- cognitive neuroscience and psychophysics
- essential maths, statistics and programming
- physical and physiological basis of brain imaging and recording

#### Requirements for Application

This combined master's and doctoral program aims at students with a first degree in biology, biomedical science, medicine, psychology, cognitive science, computer science or a related field who have a strong interest in biomedical and cognitive neuroscience.

Profound knowledge in general biology and/or cognitive science as well as basic knowledge in maths and statistics are essential.

### GRADUATE SCHOOL OF NEURAL INFORMATION PROCESSING

#### Area of Study and Research

The Graduate School of Neural Information Processing provides research-oriented training in a wide spectrum of computational neuroscience topics, such as coding principles in sensory periphery and their clinical application; population coding in the early sensory cortex; perceptual inference mechanisms; and multi-sensory integration processes. Other fields of research include brain computer interfaces, neuroprosthetics and rehabilitation robotics. Furthermore, students get insight into the development of new techniques in MEG and fMRI to improve spatial and temporal resolution. The interdisciplinary combination of neurobiological, psychophysical and theoretical approaches will not only advance understanding of sensory and neural information processing but will also promote the development of technical devices mitigating lost sensory organ or brain function.

#### Teaching Program – Curricular Focus

- neural data analysis and models of neural coding and computation
- computational motor control and computational vision
- rehabilitation robotics and brain computer interfaces
- physical and physiological basis of neural recordings and brain imaging
- systems neuroscience and neurophysiology
- basic mechanisms of learning and memory
- mathematics, statistics and programming
- machine learning for neuroscience
- theoretical neuroscience
- behaviour and cognition

#### Requirements for Application

This combined master's and doctoral program aims at students with a first degree in physics, mathematics, computer science, bioinformatics, engineering or a related field who have a strong interest in biomedical and neural sciences and technical applications.

Profound knowledge in maths (linear algebra, analysis), statistics, elementary probability theory, and programming skills in at least one language are compulsory.

### GRADUATE SCHOOL OF CELLULAR & MOLECULAR NEUROSCIENCE

#### Area of Study and Research

The Graduate School of Cellular & Molecular Neuroscience provides research-oriented training with a focus on neurologic and psychiatric disorders employing genetic, molecular and cellular approaches as well as molecular imaging techniques and transgenic mouse technology. Of particular importance is basic and clinical research on pathogenetic mechanisms leading to neurodegenerative diseases of the aging brain, such as Alzheimer's and Parkinson's disease and Chorea Huntington. A second research focus in Tübingen is on sensory organs, in particular on the genetic causes and pathomechanisms of hereditary retinal disorders, the molecular mechanisms of myopia development, the role of epigenetic and transcription factors for inner ear development, and the molecular mechanisms of hearing loss and tinnitus. Further research topics include neurooncology, neurodevelopment, synaptic plasticity and neuroregeneration.

#### Teaching Program – Curricular Focus

- molecular and cell biology of neurons and glia
- sensory systems neuroscience and their pathology
- neurophysiology, neurochemistry and neurotransmitters
- cellular and molecular mechanisms of learning and memory
- microscopy/cell and molecular imaging techniques
- genetic and molecular basis of neural diseases
- neural plasticity and neuroregeneration
- model organisms in neurobiology
- behavioural neuropharmacology
- developmental neurobiology

#### Requirements for Application

This combined master's and doctoral program aims at students with a first degree in biology, biochemistry, biotechnology, biomedical science, medicine or a related field who have a strong interest in clinical neuroscience and neural diseases.

Profound knowledge in genetics, biochemistry, and molecular and cell biology are indispensable requirements for a successful accomplishment of the course.