OTTO VON GUERICKE UNIVERSITY MAGDEBURG

A good place to study and doing research

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MASTER OF SCIENCE: INTEGRATIVE NEUROSCIENCE

The Center for Behavioral Brain Sciences CBBS overarches the research activities of the neuroscience-oriented professorships and departments in the Faculty of Natural Sciences, the Faculty of Medicine, the Leibniz Institute for Neurobiology (LIN) and the German Center for Neurodegenerative Diseases (DZNE). The CBBS is one of the largest neuroscience research networks in Germany.

Teaching within the international Master program Integrative Neuroscience is provided by professors as well as lecturers from these renowned research institutes. The curriculum format is based on the model of US graduate schools. The English-language program recruits German and international scientists specializing in biology, biochemistry, biosystems technology, chemistry, physics, psychology, computer science, electrical engineering and human and veterinary medicine.

There are attractive professional fields for graduates in the following areas:
- basic research and teaching
- applied research, for example in the fields of medical technology or biotechnology
- science journalism
- science policy

The course, which is strongly research-oriented in terms of both theory and practice, comprises a broad spectrum of neuroscientific areas and technologies. The neurobiological principles of animal and human behavior, and in particular of learning and memory processes, are conveyed within the English-language curriculum.

Cooperation partners:
- Faculty of Medicine of the Otto von Guericke University Magdeburg
- German Center for Neurodegenerative Diseases (DZNE)
- Leibniz Institute for Neurobiology (LIN): molecular, cellular and systemic foundations of learning and memory
- Leibniz Science Campus
- Center for Neuroscientific Innovation and Technology ZENIT GmbH

MASTER OF SCIENCE: MOLECULAR BIOSYSTEMS

The program Molecular Biosystems aims to generate a comprehensive understanding of complex biological processes, their dynamics and regulatory mechanisms at a system level. For this, complementary knowledge in biochemistry and molecular biology, as well as in system biology, regulation biology, bioinformatics and system theory is taught.

In the Molecular Biosystems program, the structure, function and dynamics of complex biological systems are investigated and quantitatively described, as well as the basics for the targeted modification of biological systems. Molecular and cellular mechanisms are particularly highlighted. In addition to experimental biology, this also requires the understanding and analysis of mathematical models of the underlying biological systems.

In the Molecular Biosystems Master program, teaching is centered on biologiy and natural sciences and, depending on the student's focus, emphasis is put on systems theory, biotechnological and molecular biology issues. Based on existing mathematical knowledge, the system theoretical knowledge is systematically expanded in order to find new routes to understand complex molecular biosystems. The four-semester program, which is largely interdisciplinary, is offered jointly by the Faculty of Natural Sciences and the Faculty of Process and Systems Engineering. In addition, the Faculty of Mathematics, the Faculty of Computer Science and the Faculty of Electrical Engineering and Information Technology are also involved in the program.

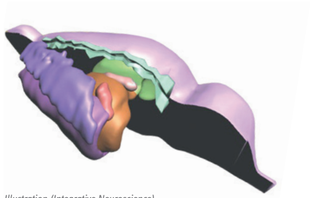


Illustration (Integrative Neuroscience)
Three-dimensional reconstruction of a rat's brain from serial cuts with insight into cortical and limbic regions.

APPLICATIONS AND ADMISSION REQUIREMENTS

ACADEMIC REQUIREMENTS

There are no admission restrictions for the Bachelor's/Master's degree in Physics at the Faculty of Natural Sciences.

For the Bachelor's/Master's degree in Psychology and the Master's degree in Integrative Neuroscience, admission is subject to a local selection procedure.

The admission requirement for the Master program in Molecular Biosystems is a Bachelor's degree in Biology, Biochemistry, Molecular Biology, Molecular Biotechnology or in a closely related subject with a minimum grade of 2.0. If the applicant has not yet completed his or her degree at the date of application, specific regulations apply.

ADMISSION QUALIFICATIONS

Program admission is subject to the general university admission qualification, a relevant subject specific qualification or a qualification recognized as equivalent by legal provision or by the Ministry of Education and Cultural Affairs of the State of Saxony-Anhalt. The enrolment regulations of the Otto von Guericke University Magdeburg contain more detailed information.

COMMENCEMENT OF STUDIES

Every year in the winter semester (from 1 October of each year)

APPLICATIONS

Application period
1 June to 15 September each year

Bachelor's and Master's degrees in Psychology
(local admission restrictions)
Applications by 15 July

Master's degree in Integrative Neuroscience
(local admission restrictions)

Applications by 15 March directly to:
Otto von Guericke University Magdeburg
uni-assist e. V.
Geneststrasse 5
10829 Berlin
Germany

Applications and enquiries to
Postal address:
Otto von Guericke University Magdeburg
Postfach 41 20
39016 Magdeburg
Germany

Street address:
Gebäude 16, Universitätsplatz 2
39106 Magdeburg

Campus Service Center (CSC)
The CSC team will put you in touch with the right person for any questions regarding your course.

Telephone: +49 (0)391 675 0000
Fax: +49 (0)391 671 1890
Email: servicecenter@ovgu.de
Web: www.servicecenter.ovgu.de

Email Dean's office: fnw@ovgu.de
Email Examination Office: fnw-pra@ovgu.de
Web: www.fnw.ovgu.de

PROGRAM INFORMATION

Faculty of Natural Sciences

OTTO VON GUERICKE UNIVERSITÄT MAGDEBURG

OTTO VON GUERICKE UNIVERSITY MAGDEBURG

The research and teaching focus of the Otto von Guericke University Magdeburg is on engineering, the natural sciences, economics and business, and medicine. The university, which was founded in 1993, has been extended by humanities, social sciences and education to address the challenges of our modern knowledge society.

More than 14,400 students, of whom over 2,200 are international students, are enrolled at the nine faculties in more than 80 different programs. This dynamic and cosmopolitan university offers state-of-the-art facilities, excellent student supervision and an application-oriented education. The key areas of research and transfer at the university are interdisciplinary and are effectively strengthened by nearby non-university research institutes.

RESEARCH FOCUS

- Dynamic Systems
- Neurosciences

RESEARCH TRANSFER FOCUS

- Automotive
- Digital engineering
- Renewable energies
- Medical technology
- Fluidized bed technology

OTTO VON GUERICKE (1602-1686)

Otto von Guericke, founder of experimental physics and vacuum technology, lent his name to the University of Magdeburg. He lived from 1602 to 1686 and is probably the city's most famous son. His interest in theories and experiments, as well as his commitment to the common welfare, are a model for and guiding principle of the university.

FACULTY OVERVIEW

The term natural sciences encompasses those sciences that are dedicated to researching the phenomena of animate and inanimate nature. In our highly engineered world, diverse innovations for technical and social developments accrue from the natural sciences. Similar to engineering disciplines, social science disciplines increasingly apply methodology from natural sciences.

The Faculty of Natural Sciences offers interdisciplinary programs with natural science, engineering and neuroscientific elements.

The following academic degrees can be obtained
- Bachelor of Science/Master of Science: Physics
- Bachelor of Science/Master of Science: Psychology
- Master of Science: Integrative Neuroscience
- Master of Science: Molecular Biosystems
- Doctor of natural sciences/Doctor of natural sciences with advanced academic teaching qualification

In addition to interdisciplinary education, the research at the Faculty of Natural Sciences is also closely linked to the engineering, computer science, medical and neuroscientific research activities of other faculties and institutes.

Research focus at the Faculty of Natural Sciences
- Semiconductor nanostructures for micro- and optoelectronics
- Wide band gap semiconductors for optoelectronics and sensor technology
- Epitactic growth and characterization
- Adaptive materials
- Non-linearity and disorder in complex systems
- Self-organization and structure formation
- Cognitive neuroscience
- Clinical neuropsychology
- General and biological psychology
- Biomedical magnetic resonance (7 Tesla MRT)
- Cortical mapping of cognitive processes
- Functional imaging of cognitive and motivational behavior
- Behavioral and developmental neurobiology
- Systemic and molecular neurobiology of learning and memory processes
- System biology

INSTITUTES

Institute of Experimental Physics
Institute of Theoretical Physics
Institute of Biology
Institute of Psychology I
Institute of Psychology II

NON-UNIVERSITY COOPERATION PARTNERS IN MAGDEBURG

- Leibniz Institute for Neurobiology (LIN)
- Fraunhofer Institute for Factory Operation and Automation (IFF)
- Max Planck Institute for the Dynamics of Complex Technical Systems (MPI)

Image below (Physics)
Research into modern LED light sources

BACHELOR OF SCIENCE/MASTER OF SCIENCE: PHYSICS

Physics is often considered to be the most fundamental of all the natural sciences; at least many representatives of this discipline take this as a fact. With the quotation from Goethe's Faust, "so that I may perceive what-ever holds the world together in its inmost folds" as their motto, physicists study how matter is composed and which forces act between its building blocks.

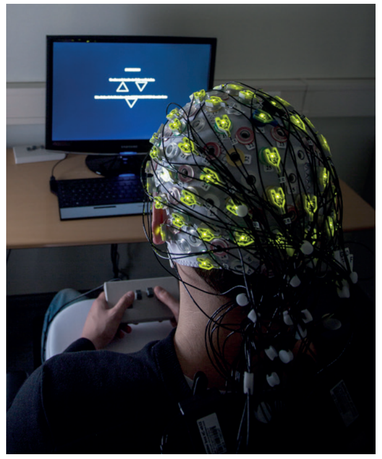
Physicists are considered to be generalists in the natural sciences. Chemistry, experimentation and theory, philosophical questions, materials science, computer science, biology and biomedicine - concepts and methods from physics can be found everywhere. Accordingly, the curriculum is broadly diversified. The applications and thus the professional job opportunities of the graduates in academia and industry are manifold.

Increasing numbers of attractive professional fields emerge outside the traditional fields of physics. These include software development, banking or information processing, corporate consulting, patenting and publishing, and environmental protection.
New, exciting and future-oriented areas are, e.g., telecommunications, renewable energies, energy conservation, the solar industry and medical technology. Long term research focuses have been established in the fields of new materials/semiconductors, Collaborative Research Center (SFB 787 – nano-photonic), or the Forschungscampus STIMULATE (medical technology for image-guided interventions). The institute operates an epitaxy laboratory for the production of semiconductor nanostructures using metal organic vapour phase epitaxy (MOVPE) and a modern microstructure center for sample characterization through spatially resolved structural and optical methods. These include spatially resolved x-ray diffractometry, transmission and electron microscopy and cathodoluminescence.

In Magdeburg, the Bachelor/Master degree in physics is offered. The six semester Bachelor's degree includes experimental physics with a laboratory course, mathematics and theoretical physics as well as elective courses such as chemistry, computer science, materials science or engineering mechanics. The Bachelor's degree completes with the bachelor's thesis. In the four-semester master's program, the student can specialize according to his interests, for example in one of the following fields: semiconductor physics, biophysics, statistical physics. The possibility for interdisciplinary curriculum (medical technology, computer science, neuroscience) is given.

Students are encouraged to extend their personal curriculum according to the catalog of elective and optional courses. The ability to work independently in a specific area is confirmed with the master's thesis. The study completes with the master's thesis including defense.

Image below (Psychology)
EEG monitoring in the neuroscience laboratory
© Center for Behavioural Brain Sciences, OVGU Magdeburg
Photo: D. Mahler



BACHELOR/MASTER OF SCIENCE: PSYCHOLOGY

We offer a Bachelor's and a Master's program in Psychology. Thus students acquire a first degree after six semesters, the Bachelor of Science.

Within this Bachelor program students acquire expertise in the different areas of psychology, and in particular psychological methodology including statistical methods, neurobiological principles of psychological processes, general psychology, social psychology, clinical psychology, neuropsychology, differential psychology, pedagogic psychology and occupational, industrial and organizational psychology.

Students may then consolidate their knowledge in a four semester Master program. In this part of their studies, which concludes with a master's thesis, they have the opportunity to specialize and expand their expertise in areas, such as clinical neuroscience, cognitive neuroscience or human-technology interaction/environmental psychology. The close connection with neuroscience, a cross-faculty research focus with two collaborative research centers, provides unique opportunities for students, including access to image-guided and neurophysiological methods (magnetic resonance imaging, magneto- and electroencephalography) within their master's thesis. Humanities and social science aspects are addressed in the focus area Human-Technology-Interaction.

A University outpatient psychology ward that is currently being established will provide the students with even more direct insights into clinical psychology and research into psychological disorders.

Graduates in Psychology have access to numerous professional job opportunities in the field of clinical care and counselling, as well as in industry and research.

More information from:
www.ipsy.ovgu.de