



Faculty of Physics and Astronomy

Julius-Maximilians-University Würzburg
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Research and Study Program Topics

Research and teaching at the highest level in the following areas :

• Condensed Matter Physics

Topological Materials, Magnetism, Spintronics, Unconventional Superconductivity, Nanostructures, Surface Physics, Quantum Transport, Quantum Dynamics, Quantum Computing, Quantum Information, Light-Matter Interactions

• Particles, Fields and Astronomy

Quantum Field Theory, Particle Phenomenology, Physics beyond the Standard Model, Gauge/Gravity Duality, String Theory, General Relativity, Multiwavelength Astronomy, High Energy Astrophysics, Cosmology

• Energy Research

Photovoltaic Materials and Devices, Quantum Sensors, Organic Semiconductors

• Imaging Physics

Nano Optics, Nuclear Magnetic Resonance (NMR), Magnetic Particle Imaging, X-Ray Microscopy and Scattering

Career opportunities and perspectives

The interdisciplinarity of our Master Programs ensures that our graduates have excellent job opportunities, in particular

- in industrial research and development
- in academics
- in IT companies and in intellectual property law firms
- in management consulting, financial services and banks.

Application Periods and Deadlines

Students may start (equivalently) either in winter or in summer semester. Classes begin in either October or April, respectively. There is no application fee.

Applications for the winter semester have to be received by 15th July and for the summer semester by 15th January of each year at the latest.

All applications are reviewed by the faculties admissions committee on a rolling basis when received and a decision on admission can be expected within two months. In general students who are among the top 25% of their peer group and meet the utmost of the admission prerequisites mentioned below, can expect to be selected.

Application Prerequisites

The following items are at least required for a successful application to one of the programs:

- A bachelor's degree (or equivalent) in physics, astronomy, quantum engineering, nanophysics or applied physics from a state-recognized University in Germany or abroad.
- Proof of English language skills (Bachelor degree in English language, or TOEFL = 72, or IELTS = 6.0).
- German language skills (A2 according CEFR) are recommended.

Application Procedure

Please check the admission prerequisites and follow the guidelines given on the web page <https://go.uni-wue.de/im> and send only one single email with one single pdf file (max. 15 MB) including all required documents attached to: international@physik.uni-wuerzburg.de.

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International Master Study Programs

- PHYSICS
- QUANTUM ENGINEERING

Studies, Research and Perspectives

Julius-Maximilians-
**UNIVERSITÄT
WÜRZBURG**



Faculty of Physics and Astronomy





International Master Study Programs

- PHYSICS
- QUANTUM ENGINEERING

Study Programs, Research Topics, Concept



International Master Study Programs

- PHYSICS
- QUANTUM ENGINEERING

at Würzburg University

Content of the Master Programs

The educational programs of our International Master of Physics (M.Sc.) as well as the International Master in Quantum Engineering (M.Sc.) are both highly competitive, two-year master's study programs with a strong focus on top class research and applications. There are no tuition fees, only a small administrative fee of about 140 Euro per Semester.

Both programs comprise 120 ECTS points (according to the European Credit Transfer System), divided into two major parts. The first two terms provide fundamental and specialized skills, acquired in lectures, tutorials, seminars and lab courses. The second part is devoted to the master project and contains project preparations, management and methods as well as the half-year master thesis.

As shown in the study plan, our programs consist of different subsections. In each of them, a minimum number of credit points must be earned.

There are two mandatory courses, the Advanced Seminar and the Advanced Laboratory Course which takes place in specific lab environments at our faculty, including important experiments devoted to the Quantum Hall Effect, the Mössbauer Effect or Superconductivity.

In Theoretical and Experimental Physics, there are a wide range of different courses, giving the opportunity to specialize in different fields, such as Particle Physics, Astronomy, Quantum Field Theory, Condensed Matter Physics, Applied Energy Research, Imaging Physics and Educational Physics.



Master student in the lab

Two courses: Physics or Quantum Engineering

The Faculty of Physics and Astronomy offers two different fascinating, demanding, and research-oriented master study programs. Both programs are taught in English and are research-focused, international Master programs in the field of physics and applied physics: a **general Physics** program and a more applications oriented **Quantum Engineering** program.

Program structure

Both programs have a similar structure. They are two-year programs and involve a combination of hands-on research in internationally recognized teams with pertinent lectures and tutorials, as well as laboratory courses.

Successful completion of either of these programs opens a gateway to careers, both in academia as well as in industry. While many of our graduates find a PhD position within our department, others decide to pursue their academic career elsewhere, being excellently prepared for both the academic and the business world.

Study Plan

International Master • Master of Science (M.Sc.)			
1 st Sem.	2 nd Sem.	3 rd Sem.	4 th Sem.
Lectures and Tutorials		Master Project Preparations, Management and Methods	Master Thesis
Advanced Seminar			
Advanced Laboratory Course			

Why study in Würzburg?

Founded in 1402, Julius Maximilians University Würzburg is one of the oldest Universities in Germany, with long tradition of excellence in research and teaching. The Faculty of Physics and Astronomy is the home of five Nobel prize winners, including Wilhelm Conrad Röntgen (X-rays) and Klaus von Klitzing (Quantum Hall effect).

Based on this tradition, within our two Master programs 'Physics' and 'Quantum Engineering' we offer a wide variety of subjects at the forefront of current research. These are centered around the following areas: Condensed Matter Physics; Particles, Fields and Astronomy; Energy Research and Imaging Physics.

Würzburg and its University

- a pleasant University town of 130.000 inhabitants with a lively student community, affordable prices, reasonable rents and short distances.
- centrally located in Germany and Europe with excellent public transport connections.
- an internationally recognized University with 29,000 students, 2,600 from abroad. The percentage of female students exceeds 50%.
- high reputation in science and research, as well as with businesses and industry.
- extensive services to students and excellent conditions for studying successfully.
- a very lively study atmosphere and safe living and working conditions.



Wilhelm Conrad Röntgen discovered X-rays in Würzburg in 1895



Würzburg, Old Bridge