dortmund university

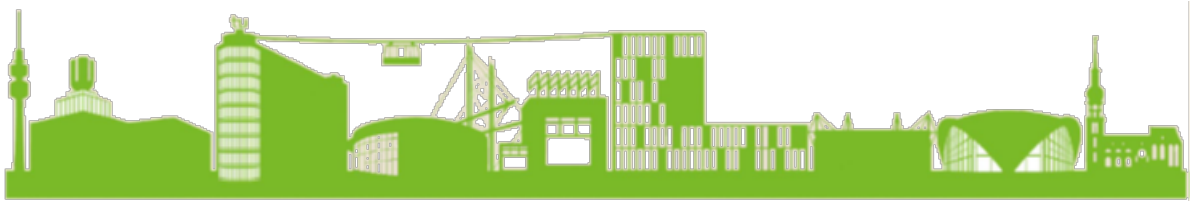
Welcome to the Master Physics at TU Dortmund University

Jan Kierfeld (Dean of Studies)

Jörg Bünemann (Academic Advisor)

Caroline Wortmann (Study Coordination)

Chris Delitzsch (Erasmus, “International affairs”)



dortmund university

TU Dortmund University at a Glance

TU Dortmund University

Spectrum of disciplines

17 departments in the area of

- Science and engineering
- Humanities and social sciences

Key statistics at a glance

- Founded in 1968
- 6,598 employees, including 325 professors
- Around 27.000 students (2025/26)
- Approx. €422 million total expenditures (2022), including €98 million third-party funding


Studies and
Teaching

Wide Range of Degree Programs

Broad selection

- Approx. 80 degree programs
- Teacher degree programs for all five types of schools, with around 25 subjects and six subjects in the area of special educational needs
- 60% of students are enrolled on natural science and engineering degree programs
- 40% of students are enrolled on degree programs in the humanities and social sciences

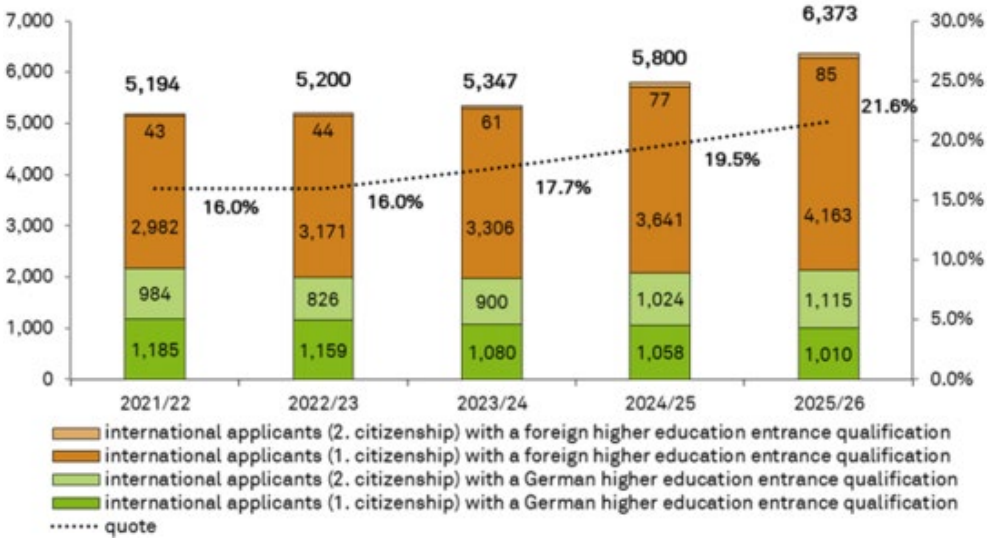
International: Students from All Continents

Cultural diversity on campus

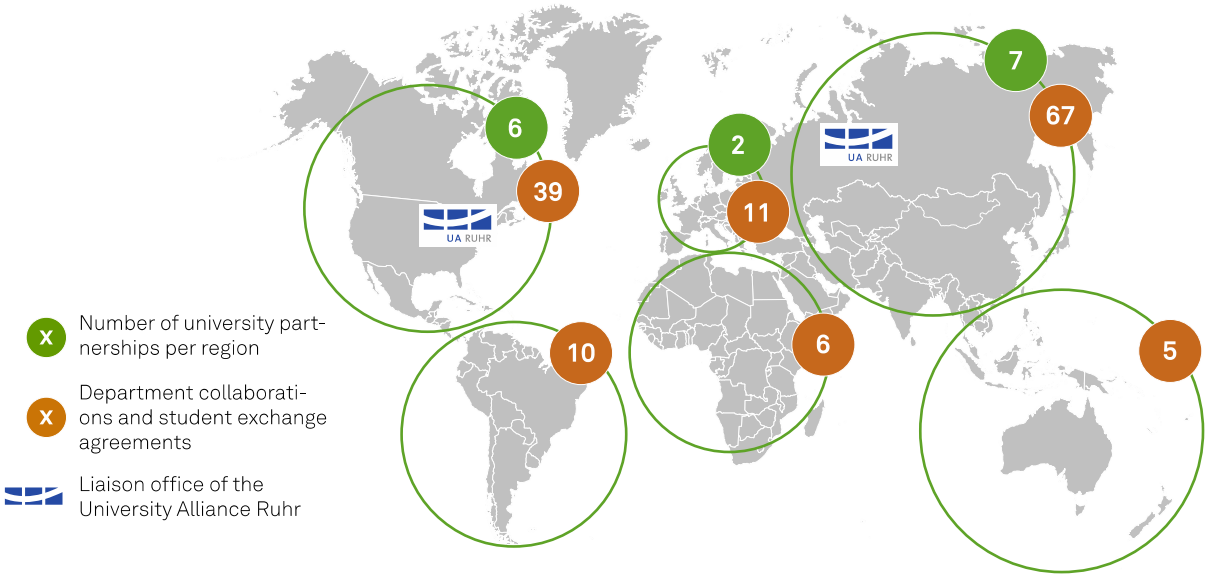
- 21.6% students with international background from around 120 different countries
- Comprehensive advisory and support program
- International Meeting Center

International study programs extended

- 15 English-language Master's degree programs



University Partnerships Throughout the World



- Around 380 cooperation agreements with universities worldwide, including 15 partnerships at university level and around 140 department collaborations and student exchange programs

University Alliance Ruhr

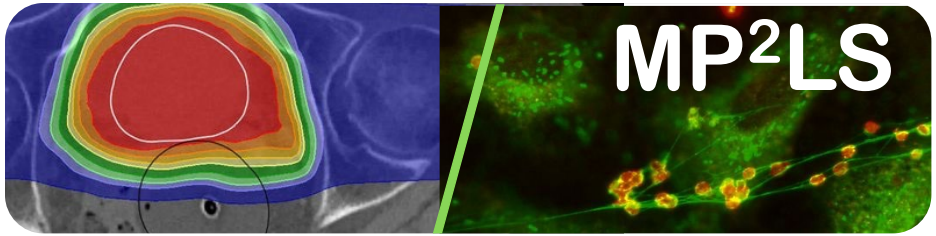
University Alliance Ruhr: Better Together

Strategic cooperation since 2007

- TU Dortmund University, Ruhr University Bochum, University of Duisburg-Essen
- Around 1,300 professors
- Around 120,000 students
- More than 16,000 graduates per year
- Around €1.6 billion total budget, including around €390 million third-party funds
- Two UA Ruhr liaison offices: New York, Eastern Europe/Central Asia

The physics department

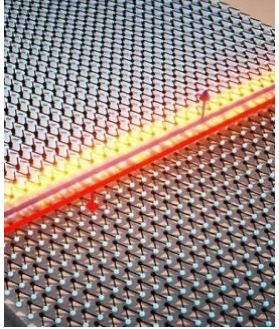
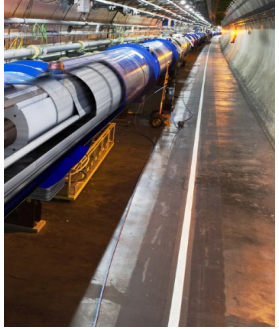
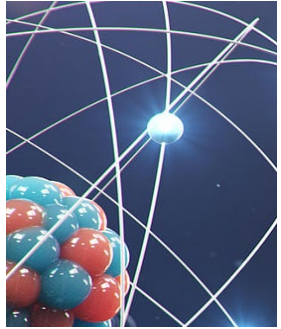
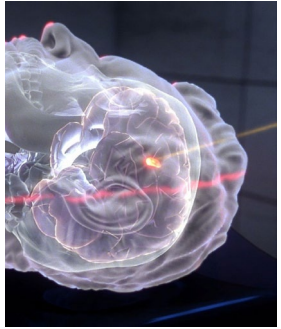
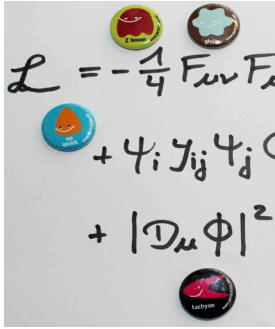
- 24 professors
- 800 students (bachelor, master, PhD)
- 3 international
  Master programs:
  Master Physics (English),
  International MAster in Particle Physics,
  Master Medical Physics and Physics of Living Systems



IMAPP

International Master
Advanced Methods
in Particle Physics

The physics department

Condensed Matter	Particle	Atoms & Molecules	Medical Physics & Living Systems	Teaching

- Main research areas:
  solid-state physics (theory/experiment)
  elementary particle physics (theory/experiment)
  medical physics
  atomic and molecular optics

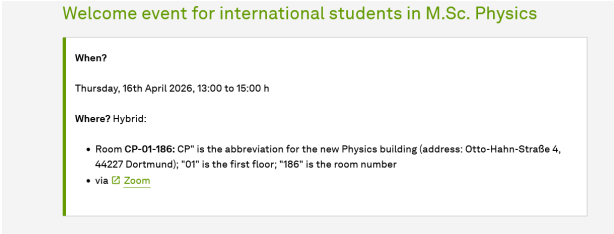
Contact Infos

- Study advisor: Dr. Jörg Bünemann, joerg.buenemann@tu-dortmund.de
- Dean of Studies: Prof. Jan Kierfeld, jan.kierfeld@tu-dortmund.de
- Administrative contact within the department: Caroline Wortmann, studiendekanat.physik@tu-dortmund.de
- Administrative contact concerning exams/grades:
  (central examinations office)
  Team 3: Christian Burgsmüller, Birgit Kienitz, Susanne Will
  pruefungsverwaltung-physik@tu-dortmund.de

Landing pages for international students:

- TU Dortmund:
  https://www.tu-dortmund.de/en/international/studying-at-tu-dortmund-university/
- Physics Department:
  https://physik.tu-dortmund.de/en/international/international-students/
- international students in Master Physics:
  https://physik.tu-dortmund.de/en/study/courses-and-qualification/master-physics/information-for-incoming-international-students/

study plans, module handbook,
link to lsf (incl. translation), events.....



Stud

- Prospective Students
- Information for New Students
- Courses and Qualification
  - Bachelor of Physics
  - Master Physics
    - Admission
    - Course Structure
    - Module Handbook
    - Examination Regulations
    - Master Thesis
    - Information for incoming international students
  - Bachelor of Medical Physics

The Master of Physics program

Description of the study programme

- Four semesters (can be started in any semester)
  - First year: deepen the students' knowledge of the subject
  - Second year: research phase that is completed with the writing of a Master's thesis
- A total of 120 credit points according to ECTS must be successfully completed

The study program is divided into modules, which comprise one or more courses. The grades of the module examinations are included in the final grade (weighted according to the credit points of the module). There is no final examination for the entire degree programme. The type of examination (oral, written) is specified in the module descriptions or announced at the beginning of the module.

Course information

The main areas of focus in our research, and thus also the possible areas of specialization for our M.Sc. Physics students, are in the fields of

The Master Physics

Entry Dates: October 1st (preferred), April 1st is also possible
Fees: no tuition fees, administrative fees of ~300 €/term
Duration: two years (four semesters)

2 phases:
1st year: course program (60 CP)
2nd year: research phase (60 CP), joining a research group, „master thesis“

The Master Physics

1st year (60CP):
2 semesters course program

mandatory: theory specialization module
theoretical particle physics
OR theoretical solid-state physics (12 CP)

mandatory:
Advanced lab course (6 CP)

2 seminars (6CP)
Elective modules (36 CP)
→ very flexible

2nd year (60CP):
2 semesters research phase
→ “master thesis”

formal substructure:

Research internship (15CP)
Methods and project planning (15CP)
Master thesis (30CP)

Students join one research group and have one year for research-oriented studies

The Master Physics

1st year: course program (60CP)

- mandatory: theory specialization module (12CP, winter term)
  theoretical particle physics OR theoretical solid-state physics
  lecture + exercises
  advanced theory course!
  choose your specialization: condensed matter or particle physics
- mandatory: advanced lab course (6CP, winter term)
  lab work, experiments, take data, analyze data, ...
- 2 seminars (6CP)
  choose 2 seminars, study your topic, presentation skills
- Elective modules (36CP)
  very flexible: choose from many electives,
  deepen in your specialization, broaden your studies

The Master Physics

2nd year: strong research phase

"master thesis year"
Students join one research group and have one year for research-oriented studies in your specialization field

Formal substructure:
- Research internship (15 CP)
- Methods and project planning (15 CP)
- Master thesis (30 CP)

About 40% of graduates continue with PhD program

How to find information?

LSF:
https://www.lsf.tu-dortmund.de/qisserver/rds?state=wtree&search=1&trex=step&root120252=195978|191518|192001&P.vx=kurz
list of modules (lectures, seminars) offered by semester

module handbook:
https://physik.tu-dortmund.de/en/study/courses-and-qualification/master-physics/module-handbook/
list of/information on ALL modules (not by semester)

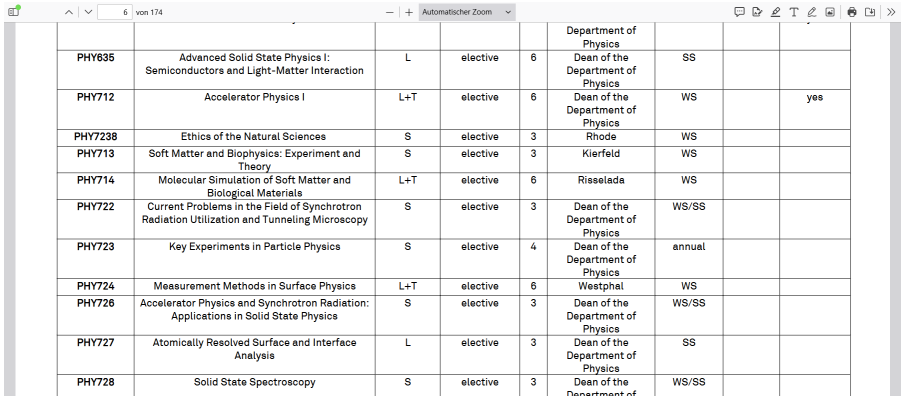
moodle:
https://moodle.tu-dortmund.de
course material, detailed information during semester

How to find information? LSF

LSF:
https://www.lsf.tu-dortmund.de/qisserver/rds?state=wtree&search=1&trex=step&root120252=195978|191518|192001&P.vx=kurz
list of modules (lectures, seminars) offered by semester

How to find information? Module Handbook

module handbook:
https://physik.tu-dortmund.de/en/study/courses-and-qualification/master-physics/module-handbook/
list of ALL modules plus informations (not by semester)



					Department of Physics			
PHY835	Advanced Solid State Physics I: Semiconductors and Light-Matter Interaction	L	elective	6	Dean of the Department of Physics	SS		
PHY712	Accelerator Physics I	L+T	elective	6	Dean of the Department of Physics	WS		yes
PHY7238	Ethics of the Natural Sciences	S	elective	3	Rhode	WS		
PHY713	Soft Matter and Biophysics: Experiment and Theory	S	elective	3	Kierfeld	WS		
PHY714	Molecular Simulation of Soft Matter and Biological Materials	L+T	elective	6	Risselada	WS		
PHY722	Current Problems in the Field of Synchrotron Radiation Utilization and Tunneling Microscopy	S	elective	3	Dean of the Department of Physics	WS/SS		
PHY723	Key Experiments in Particle Physics	S	elective	4	Dean of the Department of Physics	annual		
PHY724	Measurement Methods in Surface Physics	L+T	elective	6	Westphal	WS		
PHY726	Accelerator Physics and Synchrotron Radiation: Applications in Solid State Physics	S	elective	3	Dean of the Department of Physics	WS/SS		
PHY727	Atomically Resolved Surface and Interface Analysis	L	elective	3	Dean of the Department of Physics	SS		
PHY728	Solid State Spectroscopy	S	elective	3	Dean of the Department of	WS/SS		

Module: Advanced Laboratory Course for Master Students I **(PHY742)**
Degree program: Physics (M.Sc.)

Frequency:	Duration:	Semester:	Credits	Work load
in WS	1 semester	1st semester	6	180h

1 Module structure
4 contact hours per week, laboratory course;
experiments are performed in small groups, and supervised by experienced scientists.

2 Language: English

3 Content
Physical experiments and measurement methods:
The knowledge and skills acquired by the students from the laboratory courses of the Bachelor's program are deepened and extended with regard to current techniques. Advanced experiments on elementary particle, nuclear, atomic and solid state physics are carried out. The respective experimental instructions contain only a brief outline of the theoretical and experimental basics, so that the required knowledge must be acquired through self-study and the handling of (English) journals is learned.

Literature:
A script will be provided. Additional literature required for understanding e.g.:
Bergmann, Schäfer, Textbook of Experimental Physics 1-6 (Walter de Gruyter 1990)
Leo, Techniques for Nuclear and Particle Physics Experiments (Springer 1994).
Thorne, Litzen, Johansson, Spectrophysics (Springer 1999).
Trade journal articles

4 Learning outcome
The students are able to independently understand, perform and analyze complex experiments and to present the facts scientifically. They have learned to familiarize themselves independently with a topic (with English-language literature), as well as to select and apply a suitable method from various measurement techniques or analysis methods. Students have learned to look for errors and to correct them if necessary. The students are able to formulate a scientific work process linguistically, to document it and to discuss its results critically. They have learned to work in a team and to communicate scientifically with each other.

5 Examination
Course credits: Preparation, experimental performance and tested experimental protocols.
Module examination: Graded oral examination (30 min).

6 Participation requirements

7 Module type
Mandatory module

8 Responsible	Faculty in charge
Dean of the Department of Physics	Department of Physics

How to find information? Moodle

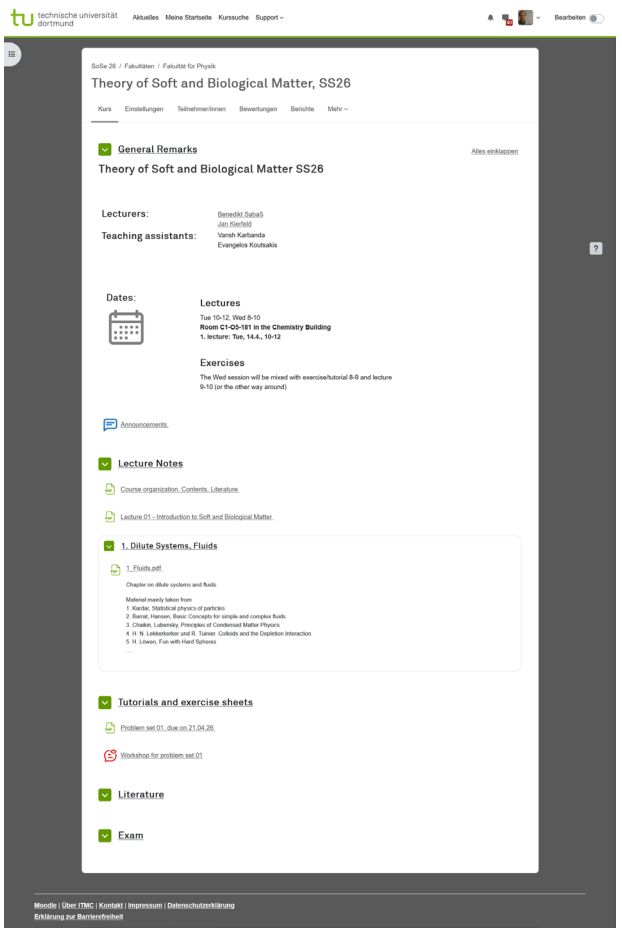
moodle:
https://moodle.tu-dortmund.de

specific information on EACH module from the lectureres

- one moodle for each module
- get there (i) from the LSF
  (ii) search in moodle

- eventually you need passwd to enroll from lecturer
- **material, specific information for each course**

- get your 2 factor authentication working!



Welcome Get Together

Save the date!

Networking Event for all Master Students in the Department of Physics
Get-to-know each other event for all Master students in the Department of Physics. Faculty members will also be on site, and there will be plenty of opportunities to ask questions.
When? Monday 27.04.26, 18:00h
Where? Physik – AV-room (P2-E0-414)