UNIVERSITÄT DUISBURG ESSEN

*Offen* im Denken

# Information for applicants for the W3 professorship in Statistical Physics

at the Faculty of Physics

# Table of contents

# 1. The University of Duisburg Essen: Open-Minded

**We are one of the youngest universities in Germany and think in terms of opportunities rather than limitations. In the heart of the Ruhr metropolis, we develop ideas with a future at 11 faculties.**

**We are strong in both research and teaching and consider diversity an integral part of our culture as we promote potential and are committed to upholding genuine equity in education.**

*A view of the Duisburg campus. Please find further images at:*
*https://www.uni-due.de/en/impressions-duisburg-campus.php*

Located in the heart of the Ruhr metropolis, the University of Duisburg-Essen (UDE) is one of the youngest and largest universities in Germany. The courses range from the humanities and social sciences via economics and business studies all the way to the engineering sciences and natural sciences (including medicine). The University has also established itself firmly in the international scientific community since being founded in 2003.

This is reflected by the top positions UDE has recently achieved in international rankings. In a comparison of the best universities founded after the turn of the millennium, UDE ranks sixth worldwide. In the Times Higher Education (THE) Young University Ranking, UDE is 18th among the top 200 international universities that are under 50 years old. UDE is also well ahead when it comes to citations of scientific publications: it ranks 15th nationwide and in the top 300 internationally in the THE World University Ranking.

The research carried out at UDE covers a broad spectrum including five cross-departmental flagship programmes: nanosciences, biomedical sciences, urban systems, transformation of contemporary societies and water research. Lifelong learning and socialisation processes are another central field of research.

Thanks to digitally supported teaching and learning concepts, UDE is an attractive location for research-based teaching. Around 42,000 students from over 130 countries are enrolled at UDE in a total of over 250 courses of study, 127 of which include the option to teach in schools.

UDE is considered a paradigm throughout Germany of how equity in education can be implemented at a university with a strong track record in research. Numerous measures and projects are in place to support talented young people and offer them prospects. UDE considers itself a vibrant environment of diversity and openness where students, researchers and staff can unfold their potential and willingness to perform. At the same time, we make every effort to ensure our development covers a wide range of areas and is resource-friendly.

In a strategic partnership, UDE is affiliated with Ruhr University Bochum (RUB) and TU Dortmund University. Together, they form the University Alliance Ruhr (UA Ruhr) and collaborate closely in research and teaching. They also have joint liaison offices on two continents. In addition, UDE maintains partnerships with more than 100 universities around the world.

## Please find further information at:

- https://www.uni-due.de/imperia/md/content/dokumente/image_broschuere_en.pdf

## What we offer as an employer:

*Seal of quality from the German Association of University Professors and Lecturers*

In August 2014, the University of Duisburg-Essen received the German Association of University Professors and Lecturers' (DHV) seal of quality for the fair and transparent nature of its appointment proceedings.

In August 2017, UDE also successfully underwent the re-audit procedure that takes place after three years and was awarded the seal of quality for the fair and transparent nature of its appointment proceedings for a further five years.

*Family-friendliness*

At UDE, there is a wide variety of services aimed at helping to reconcile work and family. The Family Service Office provides advice regarding very practical matters of childcare and care for relatives. Furthermore, there are various care services on offer including daycare facilities, holiday care and short-term care.

Since 2010, UDE has also successfully taken part in the family-friendly university audit (*audit familiengerechte hochschule*) run by berufundfamilie GmbH. Even as a 'family-friendly university', UDE continues to consider improving family-friendliness a shared goal of all University members and consistently pursues the self-commitments that result from the audit.

*Onboarding and Dual Career Service*

The Onboarding team within the Appointment Management Department provide advice for getting started at UDE and can connect you with UDE's consultation services. They also offer the Dual Career Service.

*Coaching and further training*

The personal further development of its staff members with management responsibilities is of particular importance to UDE. At UDE, it goes without saying that we offer coaching and seminars on leadership development, which are provided both internally and externally. Together with the Personnel Development Department, other suitable tools for furthering these staff members can be identified.

*Promoting good health*

As part of UDE's efforts to promote good health, there are numerous opportunities that enable staff to do something for their health and well-being in an active way at or near to the workplace.

*Company ticket*

The company transport ticket enables inexpensive and environmentally friendly mobility.

## 2. Faculty of Physics

The members of the Faculty of Physics work in the fields of Experimental Physics, Theoretical Physics and Didactics of Physics. With the exception of didactics, which, like all teacher training programmes, is located at the Essen campus, all working groups are located at the Duisburg campus. There are currently 22 full professorships at the Faculty, twelve of which are assigned to Experimental Physics, eight to Theoretical Physics and two to Didactics of Physics. In addition, there are two joint appointments with Forschungszentrum Jülich. Approximately 50 budget positions are available for academic staff. This makes the physics department in Duisburg-Essen one of the largest departments in Germany.

**Research**

The Faculty has a traditional focus on the subject of condensed matter physics. It is one of the strongest research sites in Germany in this area and covers a wide range of cutting edge topics such as magnetism and magnetic materials, ultrafast and non-equilibrium physics, nanostructure physics, 2D materials, physics of surfaces and interfaces as well as solid state theory and computational physics. The Faculty thus makes a significant contribution to UDE's strategic research area “nanoscience” and contributes to the interdisciplinary Centre for Nanointegration Duisburg-Essen (CENIDE) with a large number of researchers. The faculty is also involved in the Research Alliance Ruhr (RAR) with one professorship in the Research Centre "Chemical Sciences and Sustainability".

In addition to condensed matter physics, the Faculty also specialises in other fields that ensure a broad range of disciplines in research and teaching. In Theoretical Physics, the Faculty has a traditional focus on statistical and mathematical physics in addition to solid state theory. Both experimental and theoretical research is carried out on planet and star formation and granular matter. The field of quantum physics, which is becoming increasingly important due to technological applications such as quantum computing, is also dealt with theoretically and experimentally at the Faculty. The didactic working groups focus on empirical studies on the introductory phase of studies, on subject-specific language and experimentation.

**Third-party funding**

The strength and international visibility of the Faculty is demonstrated by the fact that it has always played a leading role in the acquisition of Collaborative Research Centres and other structured programmes of the German Research Foundation (DFG). The Faculty is currently involved in the CRC 1242 “Non-equilibrium Dynamics of Condensed Matter in the Time Domain”, is one of the two sites of the CRC/TRR 270 “Hysteresis Design of Magnetic Materials for Efficient Energy Conversion (HoMMage)” and is involved with several scientists in the CRC/TRR 247 “Heterogeneous Oxidation Catalysis in the Liquid Phase”, the International Research Training Group IRTG 2803 “2D-MATURE” and the RESOLV Cluster of Excellence. Members of the Faculty are also involved as PIs in the SFB/TRR 173 and in DFG priority programmes

and research groups as well as in large EU and BMBF projects. In addition, there are numerous individual projects funded by the DFG, foundations and MERCUR, among others.

**Teaching**

In addition to the physics and physics teaching degree programmes (Bachelor and Master), the Faculty of Physics has been offering the interdisciplinary Bachelor/Master degree programme in Energy Science, which includes a compulsory year abroad, since the winter semester 2011/12. In addition, there is the Bachelor/Master programme NanoEngineering, which is offered together with the Faculty of Engineering, as well as service courses for chemistry, medicine, biology and several engineering subjects.

Just under 1000 students are currently enrolled on the Physics programmes.

**Outreach**

The Faculty of Physics is making special efforts to get young people interested in physics and to increase the number of students and in particular the proportion of female students. Particularly noteworthy are:

- the trial study programme (from grade 12);
- the annual school competition "freestyle-physics" with over 2000 participants;
- the NanoSchoolLab;
- participation in the nationwide summer university for women in science and technology and in Girls' Day every year.

## 3. Theoretical Physics

In addition to solid state theory, computational physics and, more recently, numerical astrophysics, Theoretical Physics at the Faculty has traditionally focused on the field of statistical and mathematical physics. In addition to quantum theory, one focus in this area to date has been on the dynamics of complex systems, whereby research into socio-economic systems using the methods of statistical physics is a speciality (physics of transport and traffic and economic physics). This also contributes to the UDE's strategic research area “Urban Systems” and the Centre for Logistics and Traffic (ZLV). One of the two professorships working in this area is now up for reappointment, the other is expected to be filled in 2027. By appointing the two professorships, the Faculty aims to preserve the field of statistical physics, which has been very successful in the past, and develop it in a modern and forward-looking direction. Possible future fields of research include data-based modelling of complex systems, socio-economic systems, quantum thermodynamics and physical methods in artificial intelligence (AI). AI methods are becoming increasingly important for physics research and are already being used in some of the Faculty's groups. Together with the newly founded Faculty of Computer Science at the UDE, research initiatives in this field are currently being prepared.

## 4. Information about the open position

We are looking for an internationally recognised researcher to represent the research field of Statistical Physics at the Faculty of Physics and develop it in a modern and pioneering direction. Possible fields of research include, for example, physical methods in artificial intelligence, data-based modelling of complex systems, socio-economic systems or quantum thermodynamics. The new research area is to be strengthened in the future by the appointment of a further professorship.

The willingness to collaborate with other groups at the Faculty of Physics and at thematically related faculties is a prerequisite. Future coordinated research projects at the UDE initiated by the applicant are strongly encouraged. Links to existing research collaborations such as the CRC/TRR 270 “Hysteresis Design of Magnetic Materials for Efficient Energy Conversion” or the CRC 1242 “Non-Equilibrium Dynamics of Condensed Matter in the Time Domain” are possible.

Excellent scientific achievements should be demonstrated by publications in high-ranking, peer-reviewed journals. Furthermore, self-acquired third-party funded projects, in particular projects funded by the German Research Foundation (DFG), are expected.

The successful candidate should represent the subject of physics in research and teaching and participate in the teaching activities of the faculty to the usual extent. The University of Duisburg-Essen places great emphasis on excellence in teaching. Didactic ideas on teaching - also taking into account the profile of the University of Duisburg-Essen - must be presented.

## 5. Legal framework

Universities are state-funded bodies under public law with legal capacity. State funding is based on the university's tasks, the obligations agreed upon in university contracts and the university's performance. They have a global budget and are not subject to individual instructions from the Ministry for Culture and Science of the state of North Rhine-Westphalia.

If the legal requirements are met, professors are appointed as permanent civil servants as a rule. Professors can also be appointed on the basis of an employment contract under private law.

When awarding a junior professorship, it is to be noted that individuals who already meet the hiring requirements for a university professorship due to having completed a habilitation or another reason cannot be considered.

### Further information (in German):

- Contacts
  www.uni-due.de/verwaltung/organisation/peo_professoren.php
- Regulations on the appointment proceedings
  www.uni-due.de/imperia/md/content/zentralverwaltung/bereinigte_sammlung/2-10-mai12.pdf
- Information on the appointment and hiring process
  www.uni-due.de/verwaltung/berufungsmanagement/

## 6. Salary

The salary of university teaching staff is stipulated by the North Rhine-Westphalian system for the remuneration of civil servants. These staff members fall under the W salary range, which contains the bands W1, W2 and W3.

Basic salaries can be supplemented with (performance) bonuses in bands W2 and W3. These performance-based salary components can be awarded

- as a result of appointment and retention negotiations (appointment and retention bonuses),
- for special achievements in research, teaching, art, further education and supporting early career researchers (special achievement bonuses),
- for assuming functional or special responsibilities as part of the University's self-governance or University management (functional bonuses).

In certain circumstances, so-called teaching and research bonuses may be paid from private third-party funds.

During appointment and retention negotiations, performance bonuses can also be agreed for a fixed period of time if they are linked to target and performance agreements.

Appointment bonuses are to be negotiated on an individual basis with the Rector of the University of Duisburg-Essen as part of appointment negotiations.

Please find a table showing the current remuneration (in North Rhine-Westphalia) for the salary bands W1, W2 and W3 at:

- https://www.finanzverwaltung.nrw.de/sites/default/files/asset/document/grundgehaelter_a_b_r_und_w.pdf

You can find information on the W salary range (in North Rhine-Westphalia) and the legal foundations for it on the following webpages:

- www.uni-due.de/verwaltung/organisation/peo_links.php
- https://www.research-in-germany.org/en/jobs-and-careers/info-for-senior-researchers/career-paths/professorship/professor-university.html

Further information (in German) can be found in the regulations on awarding performance-related bonuses:

- www.uni-due.de/imperia/md/content/zentralverwaltung/bereinigte_sammlung/3_60.pdf