



Deutscher Akademischer Austauschdienst  
German Academic Exchange Service



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# Graduate school



## HEiKA Graduate School on Functional Materials

Karlsruhe Institute of Technology • Karlsruhe



## Overview

### Description/content

**The Cluster of Excellence 3D Matter Made to Order (3DMM2O)** is a Research Cluster jointly run by **Karlsruhe Institute of Technology (KIT)** and **Heidelberg University**.

The main task of the Cluster is to take 3D Additive Manufacturing to the next level by breaking current barriers of scale, precision and speed. The Cluster aims to advance 3D Additive Manufacturing from the macroscale to the microscale, nanoscale, and eventually the molecular scale. It also aims to implement technology in three selected application areas.

Built upon the scientific expertise of 40 Principal Investigators from KIT and Heidelberg University, the Cluster is characterised by a highly interdisciplinary research approach. Principal investigators (PIs), postdoctoral and doctoral researchers in chemistry, physical chemistry, physics, biophysics, biology, biomechanics, mechanical engineering and electrical engineering work together in the Cluster.

**The HEiKA Graduate School on “Functional Materials”** with its about 100 members is a central structural element of the Cluster. It offers a training programme preparing the doctoral researchers not only for their research career and their work in the Cluster but also in the areas of science communication and management. Individual mentoring committees ensure the supervision for the doctoral researchers.

In addition, annual research conferences in rotating subfields of the Cluster and annual retreats of the doctoral researchers as well as welcome and networking events are part of the programme.

HEiKA's offer contributes to the continuous deepening of the partnerships and to the development of new cross-disciplinary connections between the PIs, doctoral candidates and postdocs from KIT and Heidelberg University.

### Application

Find open positions here: [www.3dmm2o.de/jobs.php](http://www.3dmm2o.de/jobs.php)

You can also apply for a doctoral scholarship funded by the [Carl Zeiss Foundation](#).

### Faculties

- Department of Electrical Engineering and Information Technology
- Department of Mechanical Engineering
- Department of Physics
- Department of Chemistry and Biosciences

### Course language

English

## Services

Financial support	Yes
Structured research and supervision	Yes
Research training / discussion	Yes
Career advisory service	<p><b>Career Service</b></p> <p>KIT Career Service: <a href="https://www.irm.kit.edu/careerservice.php">https://www.irm.kit.edu/careerservice.php</a></p> <p>Heidelberg University – Career Service: <a href="https://www.uni-heidelberg.de/studium/imstudium/careerservice/">https://www.uni-heidelberg.de/studium/imstudium/careerservice/</a></p> <p><b>Equal Opportunity</b></p> <p>The Karlsruhe Institute of Technology and Heidelberg University are dedicated to create equal opportunities. Both institutions have defined strategic gender-equality plans to increase the proportion of women at all qualification levels by offering gender-specific mentoring at all stages of a scientific and academic career. Specific measures and services of <a href="#">Care Support and Career Development</a> are offered within the HEiKA Graduate School.</p>
Support for international students and doctoral candidates	<ul style="list-style-type: none"><li>• Welcome event</li><li>• Tutors</li></ul>

## Doctoral Programmes

List of doctoral programmes and other offers	<p><b>Research Programme</b></p> <p>The <a href="#">research programme</a> is divided into three Research Areas, each of which is comprised of three Thrusts.</p> <p>The Molecular Materials Research Area (A) focuses on designing novel molecular “inks” and “resists”, thereby providing the basic building blocks. The Technologies Research Area (B) is concerned with advancing the technology of 3D Additive Manufacturing in terms of spatial resolution, speed, scalability, and multi-material printing. The joint advances of Research Areas A and B will create a “technology push”. Building on this “push”, the Applications research area (C) explores the possibility of novel applications in materials and life sciences.</p> <p><b>HEiKA offers a comprehensive training framework, including:</b></p> <ul style="list-style-type: none"><li>• PhD agreement with a layout of the planned thesis</li><li>• Training programme</li><li>• Mentoring programme</li><li>• Funds for supporting research stays abroad</li><li>• Annual research conferences in rotating subfields of the Cluster</li><li>• Annual retreats for young researchers</li></ul>
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## Our Partners



# Karlsruhe Institute of Technology

The Cluster of Excellence 3DMM2O is jointly run by Karlsruhe Institute of Technology and Heidelberg University.

### Karlsruhe Institute of Technology (KIT)

In 2009, following a successful bid in the German Universities Excellence Initiative, the Karlsruhe Institute of Technology (KIT) was founded in a merger of the Forschungszentrum Karlsruhe GmbH and Universität Karlsruhe (TH). Fulfilling the functions of both former institutions, KIT combines tasks of a university of the state of Baden-Württemberg with those of a centre of the Helmholtz Association in the areas of research, teaching, and innovation. In 2019, KIT was selected as a University of Excellence in the German Excellence Strategy.

With more than 9,000 employees, 24,300 students and an annual budget of about 900 million EUR, KIT is one of the biggest research and education institutions worldwide and reaches top results in international rankings, especially in natural sciences as well as engineering and technology.

KIT is especially known for its engineering department, which not only has a long and successful tradition but also a reputation for its dominance in the number of intakes at the university. This is reflected in KIT being ranked highly in the discipline Mechanical Engineering, e.g., fourth in Germany in the Times Higher Education World University ranking in 2019.

KIT is an institution of top research, excellent scientific education, and a prominent location of academic life, life-long learning, comprehensive advanced training, unrestricted exchange of know-how, and sustainable innovation culture.

For the standards of excellence to be accomplished in the best possible way, KIT's research covers the complete range from fundamental research to close-to-industry, applied research and from small research partnerships to long-term large-scale research projects.

### Heidelberg University

Heidelberg University was founded in 1386, making it Germany's oldest university. It is a research university of international standing with a leading position within Germany and Europe that competed successfully in both rounds of the German Universities Excellence Initiative (2005, 2017). In 2019, Heidelberg University was selected as a University of Excellence in the German Excellence Strategy.

Heidelberg University's reputation is especially strong in the life sciences, as evidenced by the QS World University Rankings 2019, in which Heidelberg University was ranked as being one of the best 40 universities worldwide in the research area. Furthermore, it was ranked the second-best German university in the life sciences overall. In the Shanghai Ranking 2018, which mainly focuses on research output, Heidelberg University was ranked as the best German university overall.

Furthermore, Heidelberg University can look back on a long tradition of innovation and success in the natural sciences: Several people integral to the historical development of the natural sciences in Germany have studied and worked at the institution, e.g., Robert Bunsen and Hermann von Helmholtz.

The university is one of the most important educational institutions in the state of Baden-Württemberg with its 30,000 students, over 13,000 staff members and an annual budget of more than 730 million EUR.

Heidelberg University's identity as a comprehensive university drives its interdisciplinary stance that aims to make possible essential contributions toward the solution of major issues facing humanity, society, and government in an increasingly changing world.



## University location

### Karlsruhe

KIT's campus lies on the Kaiserstrasse, the main street of Karlsruhe, and it borders on the Hardtwald Forest, a perfect place to take a stroll. The campus is almost 60 hectares large. The proximity to Alsace and the mild climate of the Rhine River gives the Baden metropolis an almost Mediterranean flair in the summer. Known worldwide, the city has a fan-like ground plan thanks to the Margrave Karl Wilhelm von Baden-Durlach. Founded in 1715, Karlsruhe is the second-largest city in the federal state of Baden-Württemberg. It is also known as the "Residence of Justice" because the seat of Germany's two supreme courts (the Federal Constitutional Court and the Federal Supreme Court) is located in Karlsruhe.

Karlsruhe lies in south-western Germany on the western edge of Baden-Württemberg and has over 300,000 residents. The city enjoys many diverse leisure, culture, and sports options, which offer something for everyone.

### Heidelberg

The name of Heidelberg stands not only for its world-famous castle, for Germany's oldest university, and for lanes steeped in history in the old town, but also for a modern scientific and economic location. With over ten museums, the city theatre, a number of cultural centres, concert halls, and orchestras as well as numerous festivals, Heidelberg also offers a very lively cultural scene.

Of the 140,000 people living in Heidelberg, a city regarded as one of the most beautiful in Germany, about one-fifth are students. With 20% of them hailing from other countries, it is no surprise that the local library has a wide selection of books in English, French, Spanish, and Russian, while cinemas often show English-language films. Countless bars and restaurants attract students with their affordable prices and long opening hours.

## Contact

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🌐 Course website: [https://www.3dmattermadetoorder.kit.edu/graduate\\_school.php](https://www.3dmattermadetoorder.kit.edu/graduate_school.php)

📘 <https://www.facebook.com/Cluster3DMM2O>

🐦 <https://twitter.com/Cluster3DMM2O>

🌐 <https://www.linkedin.com/school/86045270>

📷 <https://www.instagram.com/Cluster3DMM2O/>

📺 <https://www.youtube.com/channel/UCufbl2dodIL46KZS9cYN9mw>

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# International Programmes in Germany - Database

[www.daad.de/international-programmes](http://www.daad.de/international-programmes)  
[www.daad.de/sommerkurse](http://www.daad.de/sommerkurse)

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