

Center for Mathematical and Computational Modelling (CM)²



The research center (CM)² was founded in June 2008 as part of the research initiative „Zukunftsinitiative Forschung (ZiF)“ of Rhineland-Palatinate. It consists of 21 research groups from six different departments of TU Kaiserslautern (biology, civil engineering, computer science, electrical engineering, mechanical engineering, and mathematics) and will thus join essential parts of the whole university. Further partners with excellent international reputation are the German Research Institute for Artificial Intelligence DFKI, the Fraunhofer Institute for Industrial Mathematics ITWM, and the Institute for Composite Materials GmbH IVW, all members of the Science Alliance. By including them the quantity and quality of potential research partners is significantly increased.

The main research areas of (CM)² are the development, application and improvement of mathematical models in the engineering sciences and further areas, their transformation into software via State-of-the-Art software technology and the development of a web of mathematical models (in analogy to and building up on the world wide web). With regard to the focus on applications in the engineering science, Kaiserslautern has a unique position in Germany when compared to the other centers of applied mathematics such as Berlin or Heidelberg.

In modern science, mathematics is a key technology. It has been the driving force behind spectacular developments in applications. Examples can be found in mathematical applications at stock exchanges, in medicine, in (virtual) material design, testing and -production or in the planning of traffic.

The web of mathematical models should allow storing, finding, executing, and combining of mathematical models. Such a vision is recognized as an attractive aim internationally. Intel's 2015 Computing Platform Vision assumes that next generation computers can communicate via models.

A successful application at the Carl-Zeiss-Foundation allowed the establishment of an inner ring of junior researchers. The main task of these researchers is the coordination of the scientific education of the junior members of (CM)². The ring is equipped with a generous budget which can be spent without control by the senior members of (CM)². This will enable the junior researchers to do independent interdisciplinary research.

(CM)² collaborates with excellent international partners. Among them are the Universities of Cambridge, Oxford, Göteborg and Eindhoven, Texas A&M, UC Irvine, UC Davis, Imperial College London, the Radon Institute in Linz, the Fraunhofer Chalmers Center Göteborg, the International Computing Science Institute in Berkeley and the Center for the Evaluation of Language and Communication Technologies in Trento.



Nonwoven optimized by mathematical simulation („Virtual product design“)

Contact

(CM)²

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Research Areas

- Industrial mathematics
- Computer algebra
- Computer science
- System on chip applications
- Material testing, structure, and design
- systems biology
- Process engineering

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