Lattice Boltzmann Research Group (LBRG)
Institute for Applied and Numerical Mathematics (IANM)
Institute of Mechanical Process Engineering and Mechanics (MVM)

KIT — Karlsruher Institut für Technologie

LBRG

Announcement for the summer semester 2026:

# Computational Fluid Dynamics and Simulation Lab

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Dr. Stephan Simonis, PD Dr. Mathias J. Krause, PD Dr. Gudrun Thäter
In collaboration with: Dr. Jasmin Hörter, Prof. Dr. Martin Frank (SCC, KIT)

This interdisciplinary practical course focuses on applications of mathematics for simulations on high performance computers, e.g., for computational fluid dynamics. Within this context, the interlocking concepts of

- **mathematical modeling**,
- **numerical simulation** (with lattice Boltzmann methods),
- **high performance computing** and
- **presentation and evaluation** of results

are taught with the help of examples.

Under guidance, a fluid dynamics problem is formulated, simulated and hence evaluated with the help of the compuational results. Therefor, the C++ software library *OpenLB* (www.openlb.net) is provided and its usage on high performance computers is enabled.
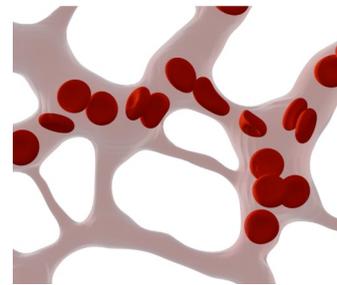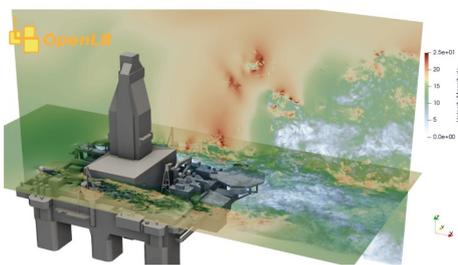
The projects are carried out in small groups that are supervised by doctoral students. At the end of the project phase, a written report has to be submitted. Each group gives a short presentation to highlight specific results obtained during the course. Own project topics suggested by the participating students are welcome.

Compulsory attendance holds for the first two dates on **April 21 and 24, 2026** and for the **project presentations in July 2026**.

GEFÖRDERT VOM

Bundesministerium für Bildung und Forschung

MINISTERIUM FÜR WISSENSCHAFT, FORSCHUNG UND KUNST
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Start:	Tuesday, April 21, 2026
Dates:	Tuesdays and Fridays, 9:45–11:15am, build. 20.30, -1.031 [in presence]
Examination:	Exercise sheets, project report, and project presentation
Credits:	4 ECTS (*upon agreement*: exercise course, seminar or laboratory*)*

The lab has an introductory character and requires solely basic prior knowledge in one of the following programming languages: C, Fortran, C++. Especially students of Masters courses in mathematics and chemical engineering are addressed. The lab can serve as thesis preparation.

Preregistration is mandatory.
Registration is on the ILIAS portal. For questions, please send an email to fedor.bukreev@kit.edu.

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