PRICING AND CONTACT

Registration fee includes

Printed lecture notes, lectures by invited speakers, software lab mentored by OpenLB developers, 5x lunch, 2x dinner, social excursion and Spring School dinner, all coffee breaks, certificate of participation

Pricing

	Early registration (by 14. January 2019)	Regular registration
Academia	€ 350	€ 500
Industry	€ 1.700	€ 1.850

Important dates

Spring School 18. - 22. February 2019

Early registration 14. January 2019

Poster session award

The award is aiming at supporting excellent students working in the field of LBM.

More information

Web: www.openlb.net/spring-school-2019
Email: springschool2019@openlb.net

SUPPORTED BY

CeMOS
Center for Mass Spectrometry and Optical Spectroscopy

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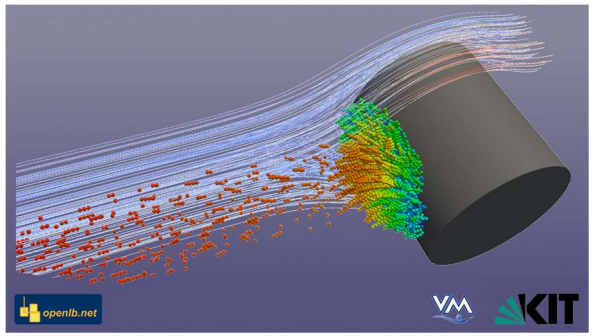
Spring School

Lattice Boltzmann Methods

with *OpenLB* Software Lab

18. - 22. February 2019

Mannheim, Germany



www.openlb.net/spring-school-2019

Executive committee

Natascha Heß-Mohr

Mathias J. Krause

Matthias Rädle

Robin Trunk

Host organizations

Karlsruhe Institute of Technology

Mannheim University of Applied Sciences

OpenLB

The field of Lattice Boltzmann Methods

In recent years, Lattice Boltzmann Methods (LBM) turned into an established numerical tool for computational fluid dynamic (CFD) problems and beyond. The simulation of complex multi-physical problems benefits strongly from the comprehensive mesoscopic modelling underlying LBM and establishes LBM besides traditional numerical methods.

The rapid development in LBM - also driven by the emergence of massive parallel computer infrastructure - enables engineers to solve relevant problems for academia as well as for industry.

Target audience

The expected attendees are developers and researchers, from industry and academia interested to learn theoretical and practical aspects of LBM. The spring school addresses e.g. engineers, computer scientists, mathematicians and physicists as well as Master and PhD students. The course level is beginners in LBM. Based on their interest in CFD, this course provides a collaborative platform for LBM, both for developers and researchers.

Objective of the spring school

The spring school introduces scientists and applicants from industry to the theory of LBM and trains them on practical problems. The first three days are dedicated to the theoretical fundamentals of LBM up to ongoing research on selected topics. Followed by two days of mentored training on case studies using *OpenLB*, the participants gain deep insights into LBM and its applications.

This educational concept is probably unique in the LBM community and offers a comprehensive and personal guided approach to LBM. Participants also benefit from the knowledge exchange during poster session, coffee breaks and an excursion.

Topic overview and preliminary agenda

	MONDAY, 18.02.2019
Morning	Registration, hand over spring school documents, introduction, LBM applications
Afternoon	Mesoscopic modeling: from micro to macro scale, LBM introduction, Chapman-Enskog expansion, target equations, boundary conditions, dimensionalisation
Evening	Poster session and dinner
	TUESDAY, 19.02.2019
Morning	LBM for turbulent flows, thermal flows, optimal control, micro flows
Afternoon	LBM for multi-phase and multi-component flows, particulate flows, efficient parallel implementation
Evening	Free
	WEDNESDAY, 20.02.2019
Morning	Introduction *OpenLB,* preliminaries (*Linux*, compile, run in parallel, *ParaView*), converter, Exercise 1
Afternoon	Social event / excursion
Evening	Spring School dinner and poster award
	THURSDAY, 21.02.2019
Morning	Setup geometry, meshing, Exercise 2, place LB models, initial and boundary conditions, convergence
Afternoon	Exercise 3, get results: console, *VTK*, images, *Gnuplot*, functor concept, Exercise 4
Evening	Dinner
	FRIDAY, 22.02.2019
Morning	Advanced models, Exercise 5 and 6
Afternoon	Option 1: work on your own application
	Option 2: OpenLB for developers: implement your own LB model

Lab room and requirements

In the computing lab sessions on Thursday and Friday, the participants are trained on practical applications, deploying the open source software *OpenLB*. Particular focus is placed on case studies, which are important to understand and verify the theory presented in the lectures earlier in the spring school. By the help of experienced tutors, the computing lab sessions also enable to set up *OpenLB* simulations for relevant problems. To guaranty personal tutoring and intensive exchange between experienced mentors and novices, the lab is limited to 50 participants.

The attendees are responsible to bring their own laptop equipped with the software

- *GNU c++ compiler 4.8 and higher*
- *OpenMPI 1.6 and higher*
- *ParaView*

Windows users prepare their laptop in advance following the *Technical Report* 4 or 5 (www.openlb.net/tech-reports).

Speakers (preliminary)

François Dubois, CNAM Paris, Université Paris-Sud, France

Timm Krüger, University of Edinburgh, United Kingdom

Timothy Reis, University of Greenwich, United Kingdom

Mathias J. Krause, Karlsruhe Institute of Technology, Germany

Max Gaedtke, Nicolas Hafen, Marc Haussmann, Fabian Klemens,

Marie-Luise Maier, Albert Mink, Markus Mohrhard, Robin Trunk,

Karlsruhe Institute of Technology, Germany

Jesse Ross-Jones,

Mannheim University of Applied Sciences, Germany