PRICING AND CONTACT

Open workshop of DFG SFB 910 and SPP 2045

The spring school is organized as open workshop being included in the DFG programs SFB 910 as well as SPP 2045. It promotes the participants of the programs in the first place, but is open for the interested general public. The spring school is organized as a non-profit event.

Registration fee includes

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

Pricing

	Early registration by 10. February 2020	Regular registration
Academia	€ 350	€ 500
Industry	€ 1.700	€ 1.850

Important dates

Spring School 9. - 13. March 2020

Early registration 10. February 2020

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-2020
Email: springschool2020@openlb.net

SUPPORTED BY

Technische Universität Berlin

Karlsruhe Institute of Technology

LBRG

SFB 910

MehrDimPart SPP 2045

openlb.net

Spring School

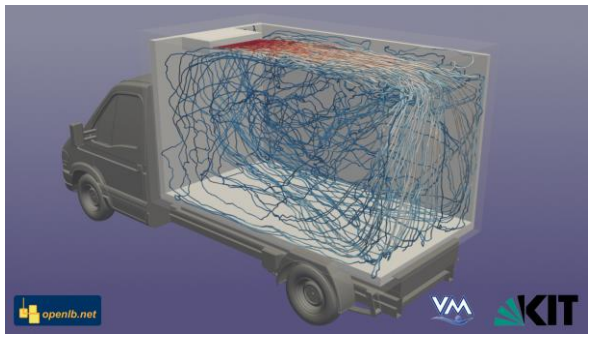
Lattice Boltzmann Methods

with *OpenLB* Software Lab

9. - 13. March 2020

Berlin, Germany

Open Workshop of DFG SFB 910 & SPP 2045



www.openlb.net/spring-school-2020

Executive committee

Nicolas Hafen (KIT)

Mathias J. Krause (KIT)

Harald Kruggel-Emden (TUB)

Christopher McHardy (TUB)

Cornelia Rauh (TUB)

Holger Stark (TUB)

Robin Trunk (KIT)

Host organizations

Karlsruhe Institute of Technology (KIT)

Technische Universität Berlin (TUB)

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 half of the week is dedicated to the theoretical fundamentals of LBM up to ongoing research on selected topics. Followed by mentored training on case studies using *OpenLB* in the second half of the week, the participants gain deep insights into LBM and its applications. Emphasis is placed on the modelling and simulation of particulate fluid flows.

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, 09.03.2020
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, 10.03.2020
Morning	LBM for turbulent flows, thermal flows, optimal control, radiative transport (light)
Afternoon	LBM for multi-phase and multi-component flows, particulate flows, efficient parallel implementation
Evening	Free, optional: help desk
	WEDNESDAY, 11.03.2020
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, 12.03.2020
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	Free
	FRIDAY, 13.03.2020
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)

Timm Krüger, University of Edinburgh, United Kingdom

Halim Kusumaatmaja, Durham University, United Kingdom

Timothy Reis, University of Greenwich, United Kingdom

Max Gaedtke, Nicolas Hafen, Marc Haussmann, Fabian

Klemens, Mathias J. Krause, Albert Mink, Stephan Simonis,

Robin Trunk, Karlsruhe Institute of Technology, Germany

Christopher McHardy, Simon Reinecke, Tony Rosemann,

Technische Universität Berlin, Germany