

Registration

The summer school fee is **250 EUR**. It includes access to all lectures and tutorials, lunch, coffee breaks and the summer school dinner.

For registration please send a (informal) mail to **register@scicomp.uni-kl.de**. We kindly ask to register **until August 11, 2017**.

Travel and accomodation

The summer school will take place at

Building 32, Room 32-349
Technische Universität Kaiserslautern
Paul-Ehrlich-Str. 32
67663 Kaiserslautern.

You can get there

- by air via Frankfurt Airport (**FRA**) which is approximately 120km away from Kaiserslautern and can be reached conveniently by train,
- by train as TGV, ICE/IC and regional trains arrive frequently at **Kaiserslautern Hbf** and
- by car (Kaiserslautern is connected by **Autobahn A6**).

From the railway station Kaiserslautern Hbf the city buses 105, 106, 115, 116 connect to the campus of the TU Kaiserslautern.

Every participant will pay for one's lodging separately. Lodging is not included in the fee. We recommend the following hotels:

- **B&B Hotel Kaiserslautern**
- **Hotel Alcatraz** (old prison, unique experience)
- **Hotel am Zollamt** (closest to the campus)



Further information

For further information on SU2 and our projects please see

- <http://su2.stanford.edu>
- <http://github.com/su2code/>
- <http://scicomp.uni-kl.de/software/>

Organization

The summer school is organized by the whole team of the Scientific Computing Chair of the TU Kaiserslautern. You can find details about us at <http://scicomp.uni-kl.de/team/>.

For general questions concerning the organization as well as in respect of the contents of the program, please send a mail to **ole.burghardt@scicomp.uni-kl.de**.

Please let me also know whether you have some wishes, especially for the tutorials, that might not be covered by the topics yet.

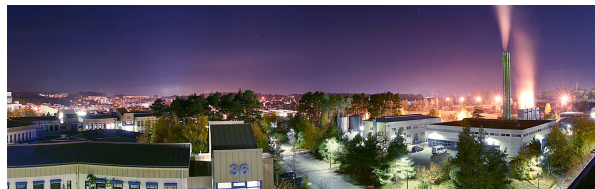
Since we unfortunately have no laptops to lend, you have to bring your own. In return we can make sure that a SU2 installation runs on your very own machine after the summer school :-).

Contact

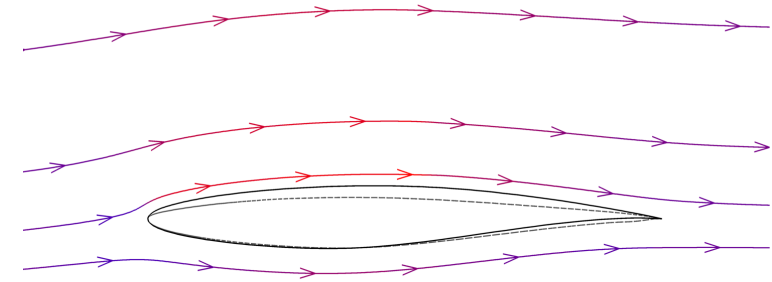
Prof. Dr. Nicolas R. Gauger

Chair for Scientific Computing
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67663 Kaiserslautern, Germany

Phone: +49 (0) 631 205 2265 (Secretary)
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Summer School on SU2



Lectures and Tutorials on the
Open-Source CFD Code SU2 and the
Adjoint Approach to Design

August 21 – August 25, 2017
Kaiserslautern, Germany



Overview

The aim of the summer school is to give an overview on how PDE-constrained optimization problems in computational fluid dynamics can be addressed using the modern open-source solver SU2 together with an adjoint approach.

The lectures will be complemented by a set of tutorials that will enable the participants to develop and contribute own code for their own specific optimization problems. This also includes changes and additions to the primal solvers.

We kick off on Monday with a Welcome Lecture on behalf of the Scientific Computing Group at Kaiserslautern University of Technology and will finish on Friday about noon.

Together we will have lunch and coffee breaks each day, on Thursday evening there will be a summer school dinner.

Schedule

Monday, August 21

09:00 – 10:00 **Welcome Lecture**

10:00 – 11:00 **Introduction to SU2**

11:00 – 11:30 Coffee break

11:30 – 12:30 **Q&A session**

12:30 – 13:30 Lunch break

13:30 – 15:00 **Optimization with PDEs, part 1**
Prof. Dr. Nicolas Gauger, TU Kaiserslautern

15:00 – 15:30 Coffee break

15:30 – 17:00 **SU2 Installation and test case (tutorial)**

Tuesday, August 22

09:00 – 10:00 **SU2 flow solver, part 1: steady cases**

10:00 – 11:00 **SU2 flow solver, part 2: unsteady cases**

11:00 – 11:30 Coffee break

11:30 – 12:30 **Optimization with PDEs, part 2**
Prof. Dr. Nicolas Gauger, TU Kaiserslautern

12:30 – 13:30 Lunch break

13:30 – 15:00 **Introduction to algorithmic differentiation**

15:00 – 15:30 Coffee break

15:30 – 17:00 **The C++ library CoDiPack (tutorial)**

Wednesday, August 23

09:00 – 10:00 **SU2 flow solver, part 3: high-level implementation**

10:00 – 11:00 **SU2 flow solver, part 4: low-level implementation**

11:00 – 11:30 Coffee break

11:30 – 12:30 **Incompressible cases with optional heat transport**

12:30 – 13:30 Lunch break

13:30 – 15:00 **SU2 optimization test case (tutorial)**

15:00 – 15:30 Coffee break

15:30 – 16:00 **Q&A session**

16:00 – 17:00 **Optimization with coupled PDEs**

Thursday, August 24

09:00 – 10:30 **Implement own code in SU2**

10:30 – 11:00 Coffee break

11:00 – 12:30 **Implement own code in SU2 (tutorial)**

12:30 – 13:30 Lunch break

13:30 – 14:00 **Q&A session**

14:00 – 15:00 **Recursive projection method**

15:00 – 15:30 Coffee break

15:30 – 17:00 **MOO and uncertainty quantification**

Friday, August 25

09:00 – 10:30 **Surrogate models**

Dr. Emre Özkaya, TU Kaiserslautern

10:30 – 11:00 Coffee break

11:00 – 12:30 **SU2 current development and outlook**

12:30 – 13:30 Lunch break and farewell coffee

Summer school venue

The city of Kaiserslautern is located at the northern edge of the Palatinate Forest – the biggest one in Europe. Its history is closely linked to being one of the Holy Roman Emperor Barbarossa's former retreats.

Today Kaiserslautern is a cultural centre and the largest city in the Palatinate, a region in southwestern Germany which is commonly well known for its castles, its vineyards and medieval villages.

