

## Application

<http://www.hzg.de/ms/summerschool/057773/index.php.en>  
Please also send your CV (pdf document, maximum one page, including the status of your education, if applicable the topic of your thesis) and your letter of motivation (signed by your supervisor also stating his/her contact address) to [summerschool@hzg.de](mailto:summerschool@hzg.de)

## Organising Committee

Jens Birch (Linköping University, Sweden), Helmut Clemens (MU Leoben, Austria), Götz Eckold (Universität Göttingen, Germany), Thorsten M. Gesing (Universität Bremen, Germany), Maths Karlsson (Chalmers University of Technology, Sweden), Anke Kaysser-Pyzalla (HZB, Germany), Martin Müller (HZG/CAU Kiel, Germany), Walter Reimers (TU Berlin, Germany), Andreas Schreyer (HZG, Germany)

## Local Organisers

A. Schreyer, *Helmholtz-Zentrum Geesthacht, Germany*  
Klaus Pranzas, *Helmholtz-Zentrum Geesthacht, Germany*  
Nicola Kampner, *Helmholtz-Zentrum Geesthacht, Germany*

## The School is supported by



The **Röntgen Ångström Cluster (RAC)** which is a collaboration between Germany and Sweden



the BMBF and the German Länder via the Röntgen Ångström Cluster

the Virtual Institute of the Helmholtz Association **New X-ray Analytic Methods in Material Science (VI-NXMM)**



and the European Commission under the 7th Framework Programme through the **Research Infrastructures** action of the "Capacities' Programme" NMI3-II Grant number 283883

## Venue and Arrival

The three-day theoretical course will be given at the conference centre „Haus am Schüberg“ in Ammersbek which is located in the North of Hamburg, about 20 km from Hamburg City centre. „Haus am Schüberg“ offers a good infrastructure for all participants. Subsequently, bus transfer will be organised to shuttle students to Hamburg to the A&O Hostel Hamburg City Süd from where students can easily reach DESY for the practicals performed the following two days.

Address of „Haus am Schüberg“ conference centre:  
Wulfsdorfer Weg 33  
22949 Ammersbek, Germany  
Tel: +49-40-6050020

Address of „A&O Hostel Hamburg City Süd“:  
Spaldingstr. 160  
20097 Hamburg, Germany  
Tel: +49-40-1812984000

## Contact

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<http://www.hzg.de/matrac>

INSTITUTE OF MATERIALS RESEARCH

# MATRAC 1 - Summer School 2015

**21.-25.09.2015**  
Including experimental-  
units at GEMS/DESY



**GEMS**  
German Engineering Materials Science Centre



**Helmholtz-Zentrum  
Geesthacht**  
Centre for Materials and Coastal Research

## Scope of School

Neutron and photon sources offer unique possibilities by complementary use of the radiations for structural analyses of advanced engineering materials. By using neutrons and photons delivered by a synchrotron radiation source, information about materials microstructures can be obtained non-destructively in the near-surface region as well as in the bulk of samples and components. Compared to conventional laboratory X-rays the spatial resolution achievable using synchrotron radiation can be improved by up to several orders of magnitude.

Diffraction methods reveal information about crystalline phase volume fractions, texture and residual stresses, while tomography provides complementary 3-dimensional images of the material's microstructure. Both diffraction and tomography have increasing impact in the fields of design of tailored materials, their processing and lifetime assessment. The current situation regarding the exploitation of photons and neutrons for engineering materials science is characterized by rapid developments: flux increase of photon and neutron sources, refurbishment of existing as well as design and construction of new beamlines and instruments with optimised beam optics and position sensitive detectors as well as increasing quality and quantity of data.

These new possibilities for microstructure analyses for advanced materials and multi-material systems meet with increasing demands from the materials engineering point of view. In materials engineering, the establishment and refinement of relationships between microstructure parameters and macroscopic properties requires information on different length and time scales, both covering several orders of magnitude.

Our school "Application of Neutrons and Synchrotron Radiation in Engineering Materials Science" is designed to provide a systematic overview of this field to students from all over Europe. As detailed on the right-hand side the program will touch all methods mentioned above in a focussed three-day course.

This school is the continuation of five very successful autumn schools with the same title which took place in 2005, 2007, 2009, 2011 and 2013.

## Organisation Details

The Summer School will provide a systematic overview of the application of neutrons and synchrotron radiation to the structural analysis of engineering materials. Students and young scientists from research and industry from all of Europe interested in this field are welcome to participate.

The school starts with a three-day theoretical course. The speakers will provide manuscripts of their lectures which will be compiled into a handout book. The focus of the practical training will be on synchrotron experiments. Neutron data analysis will also be practised. Therefore the participants will spend two days doing experiments at GEMS/DESY in Hamburg, especially at the GEMS instruments of the Helmholtz-Zentrum Geesthacht.

The Summer School is significantly funded by German and Swedish authorities for their respective students. Therefore, the participation fee amounts to 50 €. Students from other European countries can request reimbursement of their travel expenses from a NMI3 grant applicable for this school.

The fee includes accommodation and food for the duration of the school as well as the book „Neutrons and Synchrotron Radiation in Engineering Materials Science“ which has resulted from previous summer schools with the same title. Payment details will be sent to you when a decision about the participation has been made. The language of the school will be English.

### *Please note*

*Application deadline: 24 June 2015  
Decision about participation: early July 2015  
Payment deadline: end of July 2015  
<http://www.hzg.de/matrac>*

## Tentative Program

### Monday, 21.09.2015

10:00 – 12:00 Registration

13:00 – 17:30 **Lectures in the following fields:**

- Materials and Processes
- Sources
- Methods

afterwards introduction of the participants

### Tuesday, 22.09.2015

09:00 – 17:00 **Lectures in the following fields:**

- Scattering
- Imaging

### Wednesday, 23.09.2015

09:45 – 14:00 Lectures in the field of „Advanced Techniques“

14:45 – 17:00 Student presentations

17:30 Bus transfer to hotel in Hamburg

afterwards boat trip and conference dinner

### Thursday, 24.09.2015

10:00 – 17:00 Practical I at DESY

### Friday, 25.09.2015

10:00 – 15:00 Practical II at DESY