



The first week (lectures) of the laboratory course will take place at Forschungszentrum Jülich near Aachen, Cologne and Düsseldorf, the second week (experiments) at the Heinz Maier-Leibnitz Zentrum MLZ in Garching near Munich.

TRANSPORTATION

Participants arriving by plane may choose Düsseldorf or Cologne airport, those taking the train should enter Jülich as destination in the travel planner. Detailed travel instructions will be given after the acceptance of participants. Transportation to Munich and back will be provided by the organisers.

ACCOMMODATION

Participants will be accommodated in shared rooms at "JUFA guesthouse Jülich" for the first week and at "Jugendherberge München-Park" for the second. Breakfast and dinner will be included. On working days lunch will be provided at the cafeterias of Forschungszentrum Jülich and Technical University Munich.

IMPORTANT DATES

Deadline for Application: 12 May 2019
23rd JCNS Laboratory Course: 2–13 September 2019

WHERE IT TAKES PLACE

Forschungszentrum Jülich GmbH
Wilhelm-Johnen-Straße
52428 Jülich

Heinz Maier-Leibnitz Zentrum
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23rd JCNS Laboratory Course

NEUTRON SCATTERING

2–13 September 2019 · Jülich / Garching, Germany

PUBLICATION DETAILS

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(page 5)





Jülich Centre for Neutron Science of Forschungszentrum Jülich, Germany, organises in cooperation with the RWTH Aachen University (Prof. T. Brückel, Prof. S. Förster, Prof. G. Roth, Dr. R. Zorn) a laboratory course in neutron scattering with experiments at the neutron scattering facilities of the Heinz Maier-Leibnitz Zentrum MLZ. The laboratory course will consist of lectures, exercises and an experimental section. It is the aim of the course to give a realistic insight into the experimental technique of neutron scattering and its scientific power.

The lectures will encompass an introduction to neutron sources, into scattering theory and instrumentation. Furthermore, selected topics of condensed matter research will be presented. In the afternoon, exercises will be solved in tutored groups to deepen the understanding of the subjects taught.

For the experimental part the participating students will work in groups of five. Each group will perform one neutron scattering experiment per day, i. e. each group will work at five different instruments. The experimental data measured will be analysed by the students assisted by the scientist responsible for the instrument.

If you are a student of physics, chemistry, material science or biosciences with BSc (or equivalent) you are welcome to apply for participation in the 23rd JCNS Laboratory Course Neutron Scattering. To follow the course you will need elementary knowledge of applied mathematics, solid state physics and quantum mechanics which is usually part of a completed BSc study of natural sciences. The course is on beginner level and not intended for post-docs having already some experience in neutron scattering. Upon request, students can participate in a written test to obtain 5 ECTS credit points.

The laboratory course is free of charge, there is no tuition fee. Forschungszentrum Jülich supports non-local students with free accommodation and half board. Travel expenses will be subsidised.

To apply for participation please fill the online form at **www.neutronlab.de**

This will generate a PDF form which should be signed and sent by mail or fax to the organisers arriving not later than 12 May 2019 (Deadline).

If you wish to send a scanned copy (including your signature!) please send it to neutronlab@fz-juelich.de

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The laboratory course is part of the curriculum of the RWTH Aachen University.

T. Brückel | S. Förster | G. Roth | R. Zorn



LECTURES AND EXERCISES:

INTRODUCTION TO NEUTRON SCATTERING (JÜLICH)

Start: 2 September 2019 8:20 h

End: 6 September 2019 18:00 h

- Introduction: Neutron Scattering in Contemporary Research
- Neutron Sources
- Neutron Primer
- Diffraction
- Nanostructures Investigated by Small Angle Neutron Scattering
- Macromolecules (structure)
- Spin Dependent and Magnetic Scattering
- Structural Analysis
- Neutron Reflectometry
- Magnetic Nanostructures
- Inelastic Scattering
- Strongly Correlated Electrons
- Dynamics of Macromolecules
- Applications of Neutron scattering – an Overview

EXPERIMENTAL SECTION (GARCHING)

Start: 9 September 2019 8:30 h

End: 13 September 2019 17:00 h

In the experimental section, experiments on typical neutron scattering instruments will be performed:

- Backscattering spectrometer
- Polarisation analysis
- Reflectometer
- Neutron spin echo
- Small angle scattering
- Ultra-small angle scattering
- Cold neutron triple-axis spectrometer
- Single crystal diffraction ¹
- Triple-axis spectrometer ^{2,3}
- Powder diffractometer ^{3,4}
- Time-of-flight spectrometer ³

(Last four Instruments made available by ¹RWTH Aachen, ²Georg-August-Universität Göttingen, ³Technische Universität München, ⁴Karlsruhe Institute of Technology)