

HITEC Methods Day

Title: Magnetic Resonance Methods

Date: 20. November 2014

Time: 9:00 –17:00
afterwards *get together* with snacks and drinks

Location: Forschungszentrum Jülich ► **Buildg. 2.16 (Technikum), Seminar Room**

Different types of spectroscopy are at the core of many analytical techniques to investigate the structure and dynamics of molecules, materials or objects. Magnetic resonance (MR), where interactions of nuclear or electron spin with magnetic radiation are studied, has become one of the most often used methods due to its flexibility and versatility. Applications are as diverse as the structural analysis of biomolecules, polymers or ceramics, the quantification of reaction dynamics and mobility of molecules, ions or fluids, the identification of components in complex mixtures such as blood, or the imaging of intransparent objects and patients. Depending on the application, different sub-fields of magnetic resonance have emerged. Nuclear magnetic resonance (NMR) spectroscopy is concerned with the analysis of structure and dynamics of matter, magnetic resonance imaging (MRI) is used for the three-dimensional mapping of various properties in an object, and electron paramagnetic resonance (EPR) analyzes the presence, dynamics and transformation of unpaired electrons in a material.

This Methods Day will provide an overview of the different sub-fields of magnetic resonance. In the morning, general introductions of NMR and MRI will explain the principles and techniques of the methods, along with a few select examples from the research of the speakers. The afternoon session will focus on EPR, with presentations on recent applications of the method in photovoltaics research.

You will learn about:

- the basic theoretical and instrumental concepts of magnetic resonance
- fundamentals of nuclear magnetic resonance spectroscopy and magnetic resonance imaging
- applications of EPR in photovoltaics research

Contents:

- Magnetic resonance
- Spectroscopy
- NMR
- MRI
- EPR
- Photovoltaics

Who should attend:

HITEC Ph.D. students; Postgraduate-, Ph.D.- and postdoctoral fellows from the fields of energy and climate research

HITEC Days

HITEC Days are an inherent part of the graduate school Helmholtz Interdisciplinary Doctoral Training in Energy and Climate Research (HITEC). They devote a whole day to a method or a scientific topic with lectures and discussions. The methodological days serve to encourage scientific interdisciplinarity and will enable the PhD students to extend their range of methods with respect to their own scientific work. HITEC Days always end with a 'Get together', some snacks and drinks. HITEC Days are open for HITEC Ph.D. students and other interested young scientists.