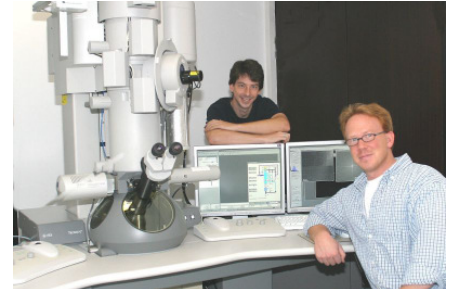


LECTURE ANNOUNCEMENT SS 2015

Scanning and Transmission Electron Microscopy / Advanced Characterisation Methods (STEM - ACM)



Fridays, 15.00 – 18.00 h
Room IC 04/410
Prof. Dr.-Ing. Gunther Eggeler
Juniorprof. Dr. Victoria Yardley
Dr. rer. nat. Christoph Somsen



The lecture course *STEM - ACM* will be given in the English language. It is aimed at students of the Master's programmes of **Mechanical Engineering** (special subjects: Materials Engineering and Micro-Engineering) and of the Master's programme **Materials Science and Simulation (MSS)**. The lecture course teaches the fundamentals that are essential for correct interpretation of microstructural results from electron-microscopic investigations. Gunther Eggeler will cover, in the **first part** of the course, the structure of matter, important crystallographic methods and the interaction between electrons and solids. In the **second part** of the course, Victoria Yardley will present the fundamentals and applications of scanning electron microscopy (SEM). Special emphasis will here be placed on orientation imaging microscopy (EBSD). In the **third part** of the course, Christoph Somsen will explain the structure of a transmission electron microscope (TEM) and introduce contrast theory and analytical electron microscopy. In three exercises, integrated into the lecture plan, the subject matter will be consolidated and illustrated with practical examples.

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|------|----------------|---|
| (1) | 24. April 2015 | Crystals and glasses |
| (2) | 08. Mai 2015 | Key crystallography techniques |
| (3) | 15. Mai 2015 | Electrons and their interaction with matter |
| (4) | 22. Mai 2015 | Exercise I |
| (5) | 05. Juni 2015 | Principles of scanning electron microscopy (SEM) |
| (6) | 12. Juni 2015 | Basics of orientation analysis in the SEM (EBSD) |
| (7) | 19. Juni 2015 | Exercise II |
| (8) | 26. Juni 2015 | Worked EBSD examples |
| (9) | 03. Juli 2015 | Key elements of a transmission electron microscopy (TEM) |
| (10) | 10. Juli 2015 | TEM diffraction contrast and analysis of defects and analytical TEM |
| (11) | 17. Juli 2015 | Exercise III |

Teaching assistant responsible for this course:

Alireza B. Parsa, Room ICFO 05/315

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