

DRESDEN
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MATERIALS & STRUCTURES

LECTURE

High Critical Currents of FeAs-based Pnictides, Y123 Cuprates and MgB₂ Superconductors

5 OCT

**13:15–
15:00**

**INSTITUTE OF LOW
TEMPERATURE AND
STRUCTURE RESEARCH**

UNDER THE AUSPICES OF

STAATSMINISTERIUM
FÜR WISSENSCHAFT
UND KUNST



Dresden.
TU



Konsulat Generalny
Republiki Federalnej Niemiec
we Wrocławiu

High Critical Currents of FeAs-based Pnictides, Y123 Cuprates and MgB₂ Superconductors – The Future of Power Applications

After a short introduction to vortex dynamics, the speakers will present and evaluate the potential of FeAs-based pnictides, Y123 cuprates and MgB₂ high-current superconducting materials. The Y123 compound is the only superconductor, which can be used at liquid nitrogen temperatures in high magnetic fields. It will be illustrated, how the critical current density of this compounds can be improved by the nano-sized defects created by chemical methods. MgB₂ is a promising low-cost superconductor for applications at 20 K. High upper critical fields in carbon doped MgB₂ will be presented. In order to interpret B_{c2}(T) data, the pronounced two-band properties of MgB₂ are taken into account. High critical current data are discussed, which are due to nano-crystalline grains in MgB₂ powder obtained by high-energy ball milling. By hot-pressing of this powder, high trapped fields in bulk MgB₂ are achieved. Finally, possible applications of bulk MgB₂ and MgB₂ tapes will be discussed.

Prof Krzysztof Rogacki studied physics at the Wrocław University from 1974 to 1978. He completed his PhD (1990) and habilitation (2004) degrees at the Institute of Low Temperature and Structure Research (Polish Academy of Science) in Wrocław, where he is now a professor.

Dr Günter Fuchs works at the Leibniz Institute for Solid State and Materials Research (IFW) in Dresden. His research areas are applied and fundamental superconductivity. He received the PASREG Award for outstanding scientific achievements in the field of bulk cuprate superconductors at high magnetic fields.

This event is a project linked with the DRESDEN-concept Science Exhibition, which is going to be on display at Plac Solny from 22 Sep until 11 Oct 2017. The exhibition is a project of 24 Dresden-based research institutions. For more information see: www.dresden-concept.de. If you are interested in visiting this event, please register at www.dresden-concept.eventbrite.de.

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