PHD Student Positions
Marie-Curie Research and Training Network

“NESPA” – NanoEngineered Superconductors for Power Applications

Leading experts from 13 European universities, research centres and industrial companies will establish NESPA, a Marie Curie Research and Training Network funded within the EU’s 6th framework programme and coordinated by the IFW Dresden. The Research and Training Network NESPA will focus on the research topic of the development of high temperature superconductor (HTS) materials for power applications. This highly multidisciplinary task involves research tasks in chemistry, physics, materials science and electrical engineering. The main research directions will be: (i) the controlled nano-engineering of superconducting materials (thin films, wires and bulk) to enhance flux pinning and thus to improve the material performance in magnetic fields and (ii) the development of advanced HTS bulk material, coated conductors and MgB$_2$ tapes. To allow a successful introduction of HTS applications into the market other enabling technologies, such as cryocoolers and cryogenic envelopes are needed and will be improved and developed within the network.

A key task of the project is the education and training of Early Stage and Experienced Researchers. The integration of the knowledge of industrial partners and academia will offer valuable training and education possibilities in the field of physics, chemistry, materials science and engineering as well as in industry relevant topics, such as intellectual property rights, quality management or special application requirements like refrigeration, cryogenics and ac-losses.

The NESPA consortium consists of
- Leibniz-Institute for Solid State and Materials Research Dresden, Dresden, D (Coordinator)
- Technical University Vienna, Vienna, A
- Institute of Electrical Engineering of the Slovak Academy of Sciences, Bratislava, SK
- Consejo Superior de Investigaciones Cientificas, Barcelona, ESP
- Institute of Low Temperature and Structure Research of the Polish Academy of Sciences, Wroclaw, PL
- Research Centre Karlsruhe, Karlsruhe, D
- University of Cambridge, Cambridge, UK
- Nexans Super Conductors, Hürth, D
- Institute of Experimental Physics of the Slovak Academy of Sciences, Košice, SK
- Stirling Cryogenics & Refrigeration, Son, NL
- Siemens AG, Erlangen, D
- Columbus Superconductors, Genoa, I
- ANSALDO Superconduttori, Genoa, I

- General description of the PHD Student Positions:

Within the NESPA program 13 PhD student positions in different research fields are available. The PhD candidates benefit from a network of leading experts from research and industry all over Europe working interdisciplinary on the development of high temperature superconductor cables and devices for power applications. The activities will comprise experimental work, analysis and characterization as well as topics as design, simulation and calculation.

The materials research topics are focussed on RE123 Coated Conductors, RE123 bulk material and MgB$_2$ wires and tapes. There, improving the critical current density requires the controlled incorporation of a high density of nano-scale defects into an undisturbed
crystalline matrix. The electrical engineering issues under consideration will concentrate on reducing ac-losses in superconducting wires and tapes by innovative conductor designs. The industrial aspects are focused on up-scaling the material preparation and the realization of superconducting cables, motors, magnets and the cryogenics involved. More detailed information with a complete list of the available PHD projects can be found at [www.nespa.eu](http://www.nespa.eu).

- **Research fields:**
  
  Chemistry, Physics, Materials Science/Engineering, Electrical Engineering and similar fields

- **Coordinator:**
  
  Dr. Bernhard Holzapfel  
  IFW Dresden  
  Institute of Metallic Materials  
  Superconducting Materials Group  
  Helmholtzstr. 20  
  D-01069 Dresden  
  
  e-mail: b.holzapfel@ifw-dresden.de

- **Requirements/Education:**
  
  We are looking for highly talented and motivated candidates aiming to obtain a doctoral degree. Both autonomous and organized working style as well as good communication skills and the ability to collaborate closely with people from other disciplines and in an international environment will be required. Candidates should hold an university degree in one of the research fields of interest. Due to EU regulations nationalities of successful applicants are restricted mainly to EU Member States or Associated States (with possible exceptions).

Candidates should send an application which should include a CV, a certificate with the disciplines of the university degree and corresponding marks, and a short statement of research interest. A list of 3 referees will be welcome.  
Deadline: 20 September 2006 by e-mail or mail to:

Dr. Teresa Puig / Prof. Xavier Obradors  
Dep. Materials magnètics i superconductors  
Institut de Ciència de Materials de Barcelona  
CSIC  

Campus UAB  
08193 Bellaterra  
SPAIN

e-mail: Teresa.Puig@icmab.es / Xavier.Obradors@icmab.es