

Looking for a PhD candidate

for the thesis topic:

Modeling of high-temperature superconductors for power and energy applications

In the Institute of Electrical Engineering,
Bratislava, Slovakia



High-temperature superconductors (superconductors below 77 K) could reduce the emission of greenhouse gases if they are used in certain power applications, like motors, generators, magnetic energy storage systems, and fusion magnets. Computer modeling tools are necessary to design these applications. However, there are no commercial software packages that directly simulate superconductors. This PhD project is to develop numerical models to predict the effect on superconducting wires of an alternating current and applied magnetic field, as those in real applications. In order to achieve this, the candidate will develop novel algorithms to solve the electromagnetic quantities in the superconductor (in close collaboration with the supervisor). During the PhD period, the candidate is expected to acquire the necessary knowledge on physics in order to be able to interpret the results. Computations will also serve to interpret the experimental data of co-workers of the institute. Finally, the PhD candidate will propose strategies on how to reduce the energy losses in superconducting applications.

Requirements: be in possession of a degree in physics (any specialisation), engineering, mathematics or similar no later than 1st of October 2013. Knowledge of a multi-purpose programming language (such as Matlab, C++ or Fortran) is welcome, although not necessary at the beginning.

Benefits: In addition to the standard benefits for a PhD candidate (stipendium and important discount on accommodation), the candidate may attend to international conferences in Europe, United States or Asia. There are several options to make research stays abroad. A PhD title from our group will be highly regarded in world-leading research institutes, universities and companies working in the same field.

Please, do not hesitate to **write an email** for more information.

Dr Enric Pardo

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