

Research and development of high performance permanent magnets and technologies is a rather complex subject that requires large scale and long-term investments. The subject is also truly multidisciplinary and requires expertise from different disciplines including physics, chemistry, materials science and engineering both in theory and experiment. NOVAMAG (NOVel, critical materials-free, high anisotropy phases for permanent MAGnets, by design) is a EU funded project aiming to develop an automated large computational screening followed by experimental screening of new and novel intermetallic compounds with uniaxial structures (with high saturation magnetization, magnetocrystalline anisotropy and Curie temperature), which can be used for the rapid development of high performance permanent magnets without the use of critical raw materials (CRM). The novelty of this proposal is the use of theoretical modelling tools to discover/develop advanced rare earth-free/lean permanent magnets. For this, a consortium with interdisciplinary expertise has been put together to undertake an integrative and concerted effort to provide the fundamental innovations and breakthroughs that are needed to design/predict theoretically new phases and microstructures required for the development and application of advanced permanent magnets without the use of critical raw materials (CRM).

In addition, the project will build on theoretical and simulation advances on the influence of microstructural features such as grain size, defects, and hard magnetic shells on the hysteresis properties of permanent magnets through computational micromagnetics simulations. Characterisation of the resulting NOVAMAG phases and magnets will be carried out to evaluate the potential for its use in markets, such as "green car" automotive components and Wind Mills.

The project is to be carried out by a consortium led by BCMaterials and composed by other 14 partners including universities, technological centres and companies.

Work Programme / Duties / Responsibilities

A three years full-time position exists for a post-doctoral experienced researcher within the nanomagnetism research group in [BCMaterials](#), an independent research centre in active and functional materials located near Bilbao in the Basque Country, north of Spain.

The postdoc will be responsible of the preparation, processing and characterization of novel uniaxial phases that have large magnetization and magnetic anisotropy, as well as writing reports and scientific articles on the research results. Neutron and Mössbauer techniques will be specifically included in the work program. He/she will also co-supervise one or more PhD students.

For the successful candidate, the position represents an excellent opportunity to develop both collaborative and personal scientific research programmes exploiting the capabilities of magnetic materials preparation, processing and characterization of BCMaterials and European neutron sources.

Contacts and Communication

Under the project manager supervision, the successful candidate will interact extensively with other researchers in the group, as well as with researchers from other partners of the NOVAMAG consortium. External representation will involve visits to other partners organizations, as well as presentation of their scientific work at the project meetings and scientific conferences.

Personal Skills and Attributes

The position requires

- A PhD in hard Condensed Matter, Materials Science and Engineering or similar.
- Previous post-doctoral experience in experimental magnetism and permanent magnet materials characterization is essential.
- Practical experience in materials fabrication and characterization with magnetometry, X-ray diffraction, SEM, Mössbauer and or neutron techniques is highly desirable.
- Fluent English and good interpersonal and presentation skills are also required.

For more information and to apply, click [here](#).