

PhD Offer

Simulation of Sustainable Permanent Magnets based on High Entropy Alloys

We are seeking candidates to start a PhD thesis at the **Materials Science Institute of Madrid (ICMM)**, a research institute of the **Spanish Research Council (CSIC)**, in the framework of the **European project BEETHOVEN** (<https://projectbeethoven.eu/>). The work will be devoted to explore **the development of rare-earth lean permanent magnets based on High Entropy Alloys (HEAs)** that compete in efficiency with those based on rare-earth. Research will be based on **multiscale magnetic models** ranging from ab-initio simulations that explore chemical compositions, structure and fundamental magnetic constants at the ground state, to micromagnetic models that incorporate temperature and field dependences of the magnetic properties. Development of **high throughput methods and machine learning algorithms** will be considered to improve the efficient exploration of big data sets.

The research will be performed **in close collaboration with the experimental groups and industry partners** that conform the BEETHOVEN consortium. Though it has a **strongly applied focus**, we are also interested in **fundamental physical problems** present in HEAs, such as the treatment of strong electronic correlations, or the description of disorder effects on a first-principles basis.

We offer an **initial contract for two years, to be extended upon common agreement** to complete the full PhD 4-year period. Our group works in an international environment, and we encourage the development of training stays abroad. The ICMM is an international reference research centre with a lively environment for junior researchers. It is deeply committed to preserving equal opportunities and inclusiveness, a philosophy that our group fully supports.

Requisites:

Candidates should hold a Master Degree on Physics, Quantum Chemistry or Materials Science. For titles obtained abroad, and in case of selection, it will be necessary to apply for the master certificate equivalence in Spain.

Interested candidates should send a CV, a transcript of their Grade and Master records, and a motivation letter to:

Silvia Gallego – sgallego@icmm.csic.es

Though not compulsory, contact details of referees are welcome.

Deadline:

The position needs to be filled **before the end of October 2024**.