INSTITUT NEEL Grenoble

Post-doc position

Combinatorial studies of hard magnetic materials

General Scope:
The demand for high performance rare earth – transition metal based magnets is continuously growing, in particular for the green energy transition (windmills, (hybrid)-electric-vehicles, electric bicycles) but also for robotics. However, the present reliance on critical rare earth elements in such magnets is not sustainable. The thin film combinatorial approach [1] combined with machine-learning [2] holds much potential to explore the use of substitutional elements, so as to reduce dependence on critical elements.

[1] Y. Hong et al., J. Mater. Res. Technol. 18 (2022) 1245
[2] A Kovacs et al., Front. Mater. 9 (2022) 1094055

Project description:
The candidate will work on the sputtering and micro-patterning of compositionally graded thin films of rare earth – transition metal hard magnetic materials (NdFeB-based phases). Sets of material libraries deposited on 100 mm wafers will be analyzed in a high throughput fashion using structural and magnetic characterization techniques operated in scanning mode. More detailed analysis will be carried out on select samples. Significant focus will be placed on data analysis. The study will be carried out in the framework of a collaboration with the group of Prof. Thomas Schrefl at the Christian Doppler Research Laboratory for Magnet Design (Danube University Krems, Austria).

Required experience and skills:
- PhD degree in experimental physics or materials science
- solid basis in magnetism, with an emphasis on functional magnetic materials
- experience in magnetic thin film fabrication and characterization would be appreciated
- experience with coding (python) for data analysis

Planned starting date: April 2023
Duration: 1 year (renewable)

Contact for additional information:
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Applicants should apply here (deadline: 15 February 2023)
https://emploi.cnrs.fr/Offres/CDD/UPR2940-FLOPOI-092/Default.aspx