**Offer title :** Post-doctoral position in Electron Microscopy and Atom Probe Tomography on low-carbon steels **(**ANR MASTERMIND2)
**Place of work:** IM2NP-UMR 7334-Marseille (France)
**Type of contract:** Fixed-term contract (CDD)
**Contract duration** : 18 months
**Planned hire date :** March 1st, 2024
**Working time :** Full time
**Remuneration:** €2500-€3000 gross per month (depending on professional experience)
**Level of studies required:** PhD
**Skills :** Expertise in Atom Probe Tomography (APT) and Transmission Electron Microscopy (TEM) would be ideal. Expertise in TEM is required. Knowledge of steel materials will be appreciated.
**Keywords :** Materials Science, Structure and Chemistry characterization at atomic level, Electron Microscopy, Atom Probe Tomography, steels, electrical machines.
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## Mission

The Institute of Materials, Microelectronics and Nanoscience of Provence (IM2NP-Marseille-France) is seeking a motivated candidate for a post-doctoral position to work on low-carbon steels for electrical machines with Electron Microscopy and Atom Probe Tomography within an ANR-funded project.

The ANR « Magnetic Ageing assisted by STrain: ExpeRimental and ModellINg Development » (MASTERMIND2) project aims at developing multi-physical models of ageing mechanisms in electrical steels and the consequences on the iron losses. Experimental investigations from the macroscopic scale down to the nanoscopic one will particularly concern carbide precipitation and the effect of pre-straining on ageing mechanisms and kinetics which has never been studied. Comparison of models to experiments will be obtained thanks to the collaboration of different French laboratories (MSMP-ENSAM Lille, Châlons-en-Champagne and Aix-en-Provence, L2EP-Lille University, IM2NP-CNRS-Aix-Marseille University).

The post-doctorate will be involved in the experimental study by APT and TEM of the evolution of the precipitation state with aging and pre-strain. Special attention will be given to the interaction of interstitials elements with dislocations at early stages of precipitation and to the determination of the nature of precipitates constituting the precipitation sequence during growth and coarsening stages. This study, implies the use of advanced nano-scale characterization of structure and chemistry down to the atomic scale. The combination of APT and TEM is thus required to characterize and understand these mechanisms that will serve as guideline for precipitation modelling.

The post-doctorate will perform both Atom-Probe Tomography (APT) and Transmission Electron Microscopy (TEM) on selected steel samples and participate to the understanding and modelling of the precipitation at the atomic scale.