Exploring novel hardware approaches based on spintronics nano-oscillators for unconventional computing

The 12 months postdoc position, contracted by the University of Grenoble Alpes, will start in Spring 2024.

Spintronics concepts and devices, such as magnetic tunnel junctions, offer novel low power hardware approaches for implementing unconventional computing schemes. Some of these make use of the phase dynamics of spintronics oscillators that have the capability to convert a DC current into an RF output voltage signal at gigahertz frequencies. Spintec is working on spintronics oscillators for the past 15 years, including experimental studies as well as theoretical concepts to describe and analyse the associated non-linear dynamic properties.

The task of the postdoc will be to experimentally investigate the phase dynamics of a specific novel spintronic oscillator configuration, including the injection locking of single and mutually coupled oscillators. This basic brick will then be extended to a larger ensemble of coupled oscillators to study the collective excitations of the system as a function of different control parameters. The experiments will be complemented by numerical simulations. The acquired knowledge will then be used to code and solve a specific computational task.

The candidate will work within a research team (experiments and theory) and will present achieved results in weekly group meetings. The subject area is very rich and provides training on different levels, ranging from magnetic tunnel junction fabrication, magneto-transport and magnetization dynamic properties, high frequency measurement techniques, numerical simulation approaches as well as concepts of unconventional computing.

For applications, please send a CV and a letter of motivation to:
Ursula.ebels@cea.fr and philippe.talatchian@cea.fr