PhD Thesis on advanced vertical magnetic medium for high-performance high-density memory applications

Location: Grenoble (France)

Company: Vertical Compute

Research institute: SPINTEC

About Vertical Compute: Vertical Compute is an early-stage deep tech startup dedicated to pioneering next-generation memory technologies for advanced computing architecture. Our mission is to redefine the well-known trade-offs of semiconductor memory devices, ultimately enabling the future of computing. We are looking for passionate, experienced, and forward-thinking colleagues to join our dynamic team and disrupt the industry together.

About SPINTEC laboratory: SPINTEC is one of the largest spintronics research laboratories worldwide, positioned at the crossroad of science and technology. SPINTEC was created in 2002 and rapidly expanded to currently reach 120 persons. The lab aims at bridging the gap between fundamental research and applications in spin electronics. As such, the outcome of the laboratory is not only scientific publications and communications at international conferences, but also a consistent patent portfolio and implementation of relevant functional demonstrators and device nanofabrication.

About Grenoble: Grenoble is a cosmopolitan city at the heart of the French Alps. One out of five people living there works in the field of research, innovation or higher education. In addition, Grenoble offers various cultural and sportive opportunities all year round

Background: Today's generative AI compute tasks are putting immense pressure on memory access by requiring model weights to be loaded continuously from a a remote (DRAM) memory. The only way to provide sufficiently large (GBs) memory on chip is to start exploiting the 3rd scaling dimension using vertically stacked data concepts. In this context, Vertical Compute is developing a unique magnetic Vertical integrated Memory device concept poised to reshape how data and compute integrate together on a chip. Thanks to the inherent high speed of magnetics and the vertical data stacking, both high performance and (very) high density can be achieved.

About what you will do: This PhD project supports the exploration of Vertical Compute's vertical magnetic device concept. The mission will be to explore, understand and develop the fundamental physics of device operation. This will require extensive magnetic and electrical characterization of 300mm fabricated devices, potentially with support of micromagnetic simulation. In this course, alternative materials and methods will be developed using SPINTEC fabrication facilities. As such, this thesis will be stationed mostly at SPINTEC in Grenoble, the PhD program being registered at Université Grenoble Alpes. You will also be part of the Vertical Compute Grenoble team, which has offices nearby.

About who you are:

- You have a Master's degree in Electrical Engineering, Applied Physics, or a related field.
- We look forward to first experiences in magnetism, magnetic devices and their fundamental behavior.
- We need your exceptional problem-solving skills and passion for tackling complex challenges.

Why a PhD thesis at Vertical Compute and SPINTEC:

- You will get the opportunity to work at the forefront of memory technology innovation.
- Vertical Compute is not only a technical journey into solving AI's bottleneck, it is a human adventure in dedicated team in a fast-paced startup environment.
- Being largely embedded in SPINTEC laboratory, you will enjoy a stimulating environment as one of the largest spintronics research institute worldwide.
- In this role, you contribute to projects that will have a significant impact on the future of computing and electronics.

Terms: the grant is a joint industry/academic so-called CIFRE contract. Its duration is 36 months, yearly bruto salary ~27 k€. The position is ready to be filled, for a start in Sep/Oct 2025.

How to show your interest in our vacancy: Find the above exciting and want to join our team? Please send your resume to people@verticalcompute.com. Vertical Compute is an equal opportunity employer. We celebrate diversity and are committed to creating an inspiring environment for all employees.

Join us in shaping the future of compute & memory technology!

Vertical Compute: https://verticalcompute.com
SPINTEC: https://spintec.fr