JOB OPENING

Physicist for R&D on quantum sensors for brain imaging

You hold a PhD on Physics, in the field of atomic physics, quantum physics, optics or plasma physics. You want to work towards the improvement of a technology that will have a great societal impact on neuronal diseases (epilepsy, traumatic brain injury, Alzheimer…)

By joining Mag4Health you will contribute to the development of a brain imaging modality which goes much further than anatomical imaging technologies like MRI. This device is made of an array of optically-pumped magnetometers, using metastable helium as sensitive element, for obtaining a very resolved movie of the currents circulating inside the brain with millisecond time resolution. This modality paves the way to much better diagnostics of neuronal diseases.

Our company

Mag4health is a startup in Grenoble (France). We are a spin-off of CEA, and we are currently 12 people (but soon 14). We develop a new generation of electroencephalography (MEG) devices, which provide accurate positioning and real-time recording of the neuronal activity. These imaging devices are routinely used for preparation of surgery of epilepsy and brain tumor, and evaluation of traumatic brain injury.

Thanks to a patented quantum technology our sensors work at room temperature, without need for cryogenic cooling which was the major technological barrier for MEG to become widespread. The democratization of MEG will not only allow more and more people to benefit for a better diagnostic and therap, but will also allow the emergence of new indications like monitoring the recovery after strokes, early diagnostic of Alzheimer…

Assignments

Inside the R&D team you will work in close collaboration with other physicists and engineers. Your main tasks will be

1. To set up and run experiments on different magnetometer schemes, in various regimes, for getting a better understanding of the current limits of our sensors (linked mainly to the photon noise of the light, but not only), and finding ways to improve then possibly down to the projection noise of the atomic spins. This task may be made in coordination with master projects and/or PhD students.
2. Contribute to the development of the sensors, notably of improved optical schemes.
3. Test and validate new process for the fabrication of sensitive element of our sensor, which is prepared thanks to ultra-high vacuum techniques and laser treatment. Develop

characterization benches for this purpose (Doppler-free spectroscopy, monitoring of coherence relaxation...)

4. Transfer to the production team simpler versions of the characterization means used for the experiments described above, so to improve the yield of the production as well as to obtain larger statistics.
5. Disclose the results in the from of patents and/or scientific publications.

Profile

- A PhD in Physics (atomic physics, plasma physics, laser), possibly completed by post-docs.
- Solid background on experimental physics (setting up an experiment, running it, processing the data…)
- Good skills on at least one programming language, ideally python
- Background on vacuum technologies, atomic physics of cold plasma physics would be a good asset.

Contract

We propose you a permanent position for taking active part in our technological adventure, and become a key actor in a dynamic and kind team with great talents. Salary to be set depending on the past experiences.

Starting date : Q1 2024.

Applications to be sent to Agustin Palacios-Laloy - apl@mag4health.com