

Two Postdoctoral Researchers in FABRICATION and CHARACTERIZATION of IMPLANTABLE MAGNETOELECTRIC/FBAR ANTENNAS

This project is part of the European EIC PATHFINDER, which will be a collaboration between the University of Glasgow and partners from Italy, Germany, and Spain. The project partners are world-class experts in neurotechnology and nanotechnology.

As we move towards the miniaturisation of antennas which can be utilised in-vivo, traditional EM devices are being replaced by **magnetolectric (ME) devices or thin-film bulk acoustic resonators (FBAR antennas)**. They comprise piezoelectric materials sandwiched between magnetostrictive materials and rely on ultra-high frequency vibration modes and couplings for transmission and reception of energy. The schematic of the device is shown in Fig. 1. The EIC PATHFINDER CROSSBRAIN project centres its technological revolution on converging novel nano-actuation modalities, bleeding-edge nano-electronics, and miniaturised wireless energy harvesting and communication. The CROSSBRAIN platform comprises a swarm of these wireless, implantable, MRI-compatible “microbots” for endovascular implantation. These will enable in vivo electrophysiology and cross-modal neuromodulation at the cell- and microcircuit levels in freely moving rodents to treat brain diseases.

The prospective candidates must have experience in one or more of the following areas:

- 1) Clean-room fabrication of piezoelectric and/or magnetostrictive devices using physical vapour deposition-based techniques, including patterning steps such as lithography and etching.
- 2) Characterization of magnetic materials using techniques such as vibrating sample magnetometry, ferromagnetic resonance spectroscopy and developing in-house dynamic magnetic excitation and recording techniques.
- 3) High-frequency characterization of ME materials (1MHz-10GHz).
- 4) Multiphysics emulations of ME coupling in materials for efficient device design (optional).

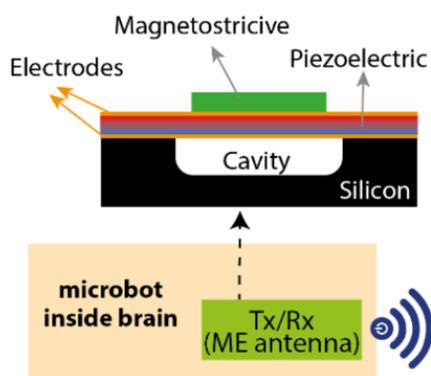


Figure 1: Schematic of cross-section of the magnetolectric (ME) antenna

We are looking for TWO Postdoctoral Researchers with clean-room experience to join this exciting project through the EIC Horizon CROSSBRAIN project. The prospective candidates will be a part of this big EU consortium project and contribute to the fabrication and characterization of miniaturized ME Antennas. The researcher is expected to work at the James Watt Nanofabrication Centre (JWNC) to develop ME antennas for wireless power/data transmission. The candidate will join the vibrant and growing team at meLAB (www.melabresearch.com) at the University of Glasgow led by Prof Hadi Heidari.

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