

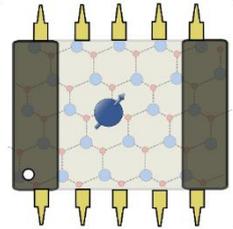


Available PhD positions

Institute of Photonics and Quantum Sciences, Heriot-Watt University

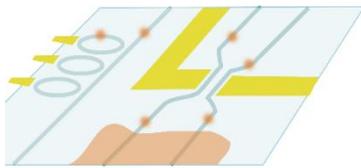
1 - Silicon carbide quantum sensing devices. A single spin is the smallest possible magnetic field sensor, providing the ultimate limit in spatial resolution and sensitivity. Quantum sensors based on single spins could open revolutionary possibilities in mapping nanoscale magnetic fields of interest for materials science and biology.

The goal of this project is to develop quantum devices for magnetic sensing based on spins in silicon carbide. Recent results have shown that spins in silicon carbide exhibit excellent properties, preserving fragile quantum states for long time. As a semiconductor widely used in microelectronics, silicon carbide is a promising platform to integrate spintronic functionalities in quantum devices compatible with the current industrial processing techniques.



Please send inquiries to Dr Cristian Bonato (c.bonato@hw.ac.uk)

2 - Integrated lithium niobate quantum devices. The goal of this project is to develop an integrated quantum photonics architecture by combining lithium niobate photonic circuits with single photon emitters based on atomically-thin 2D materials. Lithium niobate is a key material in integrated optics, widely used to develop photonic components such as ultralow-loss waveguides, switches, multiplexers and resonators. Due to its electro-optical properties, lithium niobate devices can be electrically tuned on fast timescales.



Our aim is to integrate on this platform a novel type of single-photon emitters, which can be deterministically created in pre-selected spatial locations in an atomically-flat 2D material. On-chip electrically-tunable lithium niobate components, developed in collaboration with the group of Dr Alberto Peruzzo (RMIT, Melbourne), will be used to collect, route and process the emitted photons.

Please send inquiries to Dr Cristian Bonato (c.bonato@hw.ac.uk) or Prof Brian Gerardot (b.d.gerardot@hw.ac.uk)

Who? Prospective students should have a first-class degree in a relevant discipline (Physics, Electrical Engineering, Materials Science) and a strong interest in experimental research. Due to funding restrictions, the studentship is available to EU applicants only.

The multidisciplinary nature of the projects will give the successful applicants the possibility to gain experience in different fields, such as semiconductor physics, quantum optics, nanophotonics, magnetic resonance, nanofabrication.

Where? The **Institute of Photonics and Quantum Sciences at Heriot-Watt University** is a vibrant environment for science, with more than 160 researchers active on different aspects within the field of Photonics. Heriot-Watt is based in the outskirts of Edinburgh, one of the most exciting and lively cities in Europe.

Application deadline: 31th January 2017.