Universität Basel

Research Project

ASTERIQS

Third-party funded project

Project title ASTERIQS
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Organisation / Research unit
Departement Physik / Georg H. Endress-Stiftungsprofessur für Experimentalphysik (Maletinsky)
Department
Project Website https://ec.europa.eu/digital-single-market/en/content/asteriqs-advancing-sc ience-and-technology-through-diamond-quantum-sensing
Project start 01.10.2018
Probable end 30.09.2021
Status Completed

ASTERIQS will exploit quantum sensing based on the NV centre in ultrapure diamond to bring solutions to societal and economical needs for which no solution exists yet. Its objectives are to develop: 1) Advanced applications based on magnetic field measurement: fully integrated scanning diamond magnetometer instrument for nanometer scale measurements, high dynamics range magnetic field sensor to control advanced batteries used in electrical car industry, labonChip Nuclear Magnetic Resonance (NMR) detector for early diagnosis of disease, magnetic field imaging camera for biology or robotics, instantaneous spectrum analyser for wireless communications management; 2) New sensing applications to sense temperature within a cell, to monitor new states of matter under high pressure, to sense electric field with ultimate sensitivity; 3) New measurement tools to elucidate the chemical structure of single molecules by NMR for pharmaceutical industry or the structure of spintronics devices at the nanoscale for new generation spin-based electronic devices. ASTERIQS will develop enabling tools to achieve these goals: highest grade diamond material with ultralow impurity level, advanced protocols to overcome residual noise in sensing schemes, optimized engineering for miniaturized and efficient devices. ASTERIQS will disseminate its results towards academia and industry and educate next generation physicists and engineers. It will contribute to the strategic objectives of the Quantum Flagship to expand European leadership in quantum technologies, deliver scientific breakthroughs, make available European technological platforms and develop synergetic collaborations with them, and finally kick-start a competitive European quantum industry. The ASTERIQS consortium federates world leading European academic and industrial partners to bring quantum sensing from the laboratory to applications for the benefit of European citizens.

Keywords Quantum sensing, Diamond, Spins, Magnetometry, Magnetic sensing, Magnetis imaging
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Add publication

Add documents

Specify cooperation partners