



University of Crete
Department of Physics

Physics Colloquium

Thursday, 28 March 2024 | 17:00 – 18:00, Seminar Room, 3rd floor

Spins as quantum bits: the second quantum revolution and a new computing paradigm

Dieter Suter

Department of Physics, Technical University of Dortmund, Germany

ABSTRACT

More than a century after the advent of quantum mechanics, we are in the midsts of a 'second quantum revolution': multiple efforts by academia as well as industry are racing to develop novel devices that draw directly on the the laws of quantum mechanics for qualitatively improving the sensitivity of sensing devices or promise a new generation of computers that are capable of solving numerical problems for which even the most powerful classical computers are inadequate. Possible physical systems for the realisation of these concepts include electronic and nuclear spins, which allow a 1:1 correspondence between the basic concept of a quantum bit or qubit and the physical 2-level system. This colloquium will focus on spins in wide-bandgap semiconductors, such as nitrogen-vacancy (NV) centers in diamond or silicon vacancies in silicon-carbide