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Ion Implantation Technologies for Fabrication of Quantum Systems

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Aula Magna, Dipartimento di Fisica, via P. Giuria 1, Torino

This seminar is organized by the PhD Program in Physics of the University of Torino.

Abstract

The second quantum mechanical revolution is based on the manipulation and control of single or coupled quantum systems. The Efforts can divided in two main fields : the information technology or sensing applications. However, in order to achieve compatibility with microelectronics, it is necessary for industrial use to realize quantum systems in a solid state. Only CMOS compatible techniques should be used to facilitate integration. The most important candidates for this purpose are the superconducting qubits and color centers in diamond. While superconducting qubits are used for information processing, the color centers are applied in sensor technology. The color centers are relatively easy to create and manipulate and they have the advantage to work at room temperature. A broad industrial use is therefore expected from this system. Ion implantation has proven itself as a manufacturing process of color centers. The lecture gives an overview of the current status and possible application areas.

The speaker



Jan Meijer is Full Professor at the University of Leipzig. Following from pioneering studies conducted at the University of Bochum, he coordinates an internationally recognized research program on the employment of ion beams in the keV-MeV range for the engineering of defects in solids for applications in quantum technologies. Since Academic Year 2017-2018, he has been appointed as member of the Board of the PhD Program in Physics of the University of Torino.