The Quantum Technologies PhD Program at our faculty will make a considerable contribution toward the development of both traditional and completely new fields of science

The development of electronics and computer technologies has physical limits preventing almost any further miniaturization of the elements and boosting of their effectiveness and performance. The mastery of quantum technologies appears a highly promising means by which to break these limits. Quantum technologies are involved in many fields of science: from quantum physics through information technology and nanostructures, quantum photonics, optics and plasmonic, new laser generators, new materials of unique properties to mathematical physics and modelling. This wide spectrum of fields is covered by the recently accredited doctoral program Quantum Technologies offered by the Faculty of Nuclear Sciences and Physical Engineering (FNSPE) of the Czech Technical University (CTU) in Prague.

“Making use of quantum effects in information technologies, data processing, communications, and electronics presents a promising breakthrough similar to the arrival of integrated circuits in the sixties. Mastering new technologies will be instrumental not only in boosting the performance of computers – of the quantum ones and others – but, most probably, mastering them will result in entirely new and entirely unanticipated discoveries,” says Professor Igor Jex, Dean of the Faculty and member of the strategic Advisory Committee of QuantERA, the European research project focused on cooperation and support of research into quantum technologies.

“We have over twenty suggested interdepartmental dissertation topics ready for students willing to join the Quantum Technologies PhD Program. The dissertation supervisors are leading scientists, both nationally and internationally,” explains Docent Ivan Richter, PhD., member of the Department of Physical Electronics, guarantor of the PhD program jointly run by the Departments of Physics, Physical Electronics, Mathematics, Solid State Engineering, and Materials. Extended supporting facilities provided by the Faculty and supported by the OPVVV (European Funds) are also available for the program. New high-performance servers and the Quantum Hyperion
cluster have been purchased, a new specialized laboratory has been set up for realizing and characterizing quantum nanostructures, as well as a unique laboratory of quantum photonics for research into quantum effects.

“Although the first quantum computers are now available, and some findings of quantum physics have been used in everyday life (these include semiconductor elements, nuclear engineering, lasers, magnetic resonance, carbon fibers, microscopy, and others), the development of quantum technologies is only at its very beginning. In fact, many fields are at the stage of fundamental research, and all those involved in this challenging research have a chance to witness the beginning of a new epoch and cooperate with the leading scientists here and abroad,“ adds Richter.

Being also aware of the importance of quantum technologies, in October 2018 the European Union created the Quantum Flagship incentive by allocating one billion EUR’s for research for a period of ten years. The main objective of the incentive is to support research into quantum technologies in Europe.

Applications for admission to the PhD program are accepted no later than August 4th, 2020. Further information on the program is available on the Faculty web giving also the dissertation topics.

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