

Mikko Möttönen

ONE OF THE VÄISÄLÄ PRIZES awarded by the Finnish Academy of Science and Letters went to Professor Mikko Möttönen.

Mikko Möttönen graduated as Doctor of Technology in 2005 at the Department of Applied Physics of what was then the Helsinki University of Technology – now Aalto University. He worked as a postdoctoral researcher at the Helsinki University of Technology, the University of California, Berkeley in the United States, and the University of New South Wales in Australia. In 2007 Möttönen became the Group Leader of Quantum Computing and Devices (QDC) in the COMP Centre of Excellence of the Academy of Finland. Over the years, he has worked as a postdoctoral researcher, an Academy Research Fellow and a Senior Scientist. In 2019 Mikko Möttönen was appointed to a professorship in Quantum Technology, a joint post shared by Aalto University and VTT Technical Research Centre of Finland.

“I became interested in quantum mechanics right at the start of my studies. It

felt like a new and fascinating topic. The Helsinki University of Technology had several research groups working in quantum mechanics, so there were plenty of opportunities available”, says Mikko Möttönen.

Möttönen is one of the world’s leading researchers in quantum information. He has earned merits as a researcher in both theoretical and experimental quantum physics. His first publications involved the dynamics of Bose-Einstein condensates and the general foundations of quantum computing algorithms. Since then, his research expanded to areas including superconducting quantum circuits, donor qubits in semiconductors, single-electron transistors and the properties of open quantum systems.

“When I returned to Finland from the United States, my friends were doing experimental research. It felt like something new and attractive”, says Möttönen.

He is currently studying quantum technology and especially superconducting

Mikko Möttönen is one of the world's leading researchers in quantum information



electric circuits which can be made to operate quantum mechanically.

“We have been able to rely on the highly advanced low temperature expertise that is available in Finland.”

Möttönen's research is characterized by strong theoretical and computational skills combined with operating and measuring highly complex quantum systems. He is cited as an author in more than 120 research articles, many of which have been published in prominent scientific journals.

“Two of the biggest highlights of my career in recent years have been obtaining a professorship in the spring of 2019 and the paper published on the radiation detector built by my group in the Nature journal in October 2020”, says Möttönen.

“The combination of theory and experiments offers wonderful perspectives when an experiment can demonstrate that a theory also works in practice.”

“My research team has been part of the EU Quantum Technologies Flagship. We have developed a bolometer that marks a

significant improvement in the speed and accuracy of these meters. If the development continues in the same way, this radiation detector could become a key component in quantum computers.”

Mikko Möttönen's exceptional success as a researcher is demonstrated by the project funding from the European Research Council (ERC) which he has been granted four times in the years 2011–2021, in addition to other funding from the Academy of Finland and the European Commission. Möttönen is a widely distinguished teacher and supervisor, and is known for making research findings known to the general public in the role of a columnist for Helsingin Sanomat and a visitor to upper secondary school, among others roles.

Möttönen has been involved in twelve patents and patent applications. He is one of the four founders of IQM Finland Oy and its Chief Scientist. IQM is developing a commercial quantum computer at Otaniemi in Espoo with a considerable seed fund.

"I really do not have much time for hobbies. I do not even ride my motorcycle anymore except to go to work and back home again, but even that has now ended due to COVID-19", says Mikko Möttönen.

"This prize is an incredibly great honour. It is humbling and I am extremely grateful to everyone. Especially the QCD group, the QTF Centre of Excellence, my international collaborators, Aalto University, VTT, IQM, CSC, funders, decision-makers, the press, my family, and all of my supporters deserve a big thank you", Möttönen says.

Väisälä Prize is awarded annually to 1–3 already distinguished scientists in the active parts of their careers.

Photo: Niki Strbian