Lauri Oksanen

Väisälä Prizes are awarded annually to distinguished scientists in mathematics and science who are in the active part of their careers. The prizes are worth 15,000 euros.

Professor Lauri Oksanen's research deals with inverse problems. Oksanen's research is applied, for example, when there is a need to know what is inside an object in medical or soil imaging. Oksanen studies the mathematical methods needed to produce such images.

Oksanen earned his Master of Science degree in 2008 and his PhD in 2012. Following this doctoral thesis, he went on to work briefly as a post doc researcher at the University of Washington and then in 2013 as a lecturer at the University College London where he was appointed permanent Professor of Mathematics in 2020. In 2021, it was time to move to Finland to become Professor of Applied Mathematics at the University of Helsinki.

Oksanen became interested in mathematics at a young age for several reasons. "Ever since comprehensive school, I've had

excellent mathematics teachers. I've definitely also had some natural inclination towards the field, in addition to a group of friends who are interested in mathematics. When I was younger, I enjoyed computer programming as a hobby, which is a lot like mathematics: both require logical thinking and the ability to express yourself in formal languages and enjoy this type of expression," says Oksanen.

Oksanen's research is exceptionally broad in scope and he is one of the world's leading researchers in numerical methods for inverse problems. He has studied numerical methods for partial differential equations, especially element methods, and his studies on discretization have attracted wide attention. Oksanen has also achieved interesting results with medical imaging methods combining different physical models, for example in photoacoustic imaging.

"My working days are quite varied. When I'm working remotely, I do a lot of reading and thinking, whereas when I'm at the university, I meet with my research

Lauri Oksanen's research deals with inverse problems

group and have lots of conversations with people, which stimulates my thinking on remote working days. Both sides are important."

Oksanen's work has gained remarkable visibility around the world, and he has been invited to speak at a number of international conferences. He has also received major funding for his research, including the ERC Consolidator Grant from the European Research Council for the years 2023–2028. This funding is aimed at distinguished researchers for consolidating their research group and establishing an impactful career in Europe. Oksanen also serves as the principal investigator at the Centre of Excellence of Inverse Modelling and Imaging of the Academy of Finland (2023–2025).

As for the future of mathematics in Finland, Oksanen feels optimistic: "We in Finland have extremely good, top-notch research groups and can conduct research in mathematics at the highest international level. Looking at the field more broadly, I wish that education in mathematics would lean slightly more towards computer science. The processing of large data sets and machine learning models, which are the hot topics today, sit largely in the intersection between mathematics, computer science and statistics."

Oksanen's dreams for the future have to do with solving certain mathematical problems, but the researcher does not want to give away too much: "Probably every mathematician has a favourite problem that they dream of solving."

Image: Maarit Kytöharju