

# Tuomo Kuusi

**PROFESSOR TUOMO KUUSI**, who received a Väisälä Prize from the Finnish Academy of Science and Letters in 2019 completed his doctorate in mathematics at Helsinki University of Technology – now part of the Aalto University – in 2007. "I started out studying technical physics and in practice made the decision to qualify in mathematics at the very last moment. Soon after I had made that decision my supervisor, Prof. Juha Kinnunen, asked me whether I would like to continue with doctoral studies. By that stage I was extremely interested in mathematics and applied mathematics in general and it seemed the right and natural thing to do to delve further into those subjects."

This led Kuusi to do postdoctoral research at the Aalto University and then at the Courant Institute and the University of Columbia in the USA. In 2018 he was appointed associate professor of mathematics at the University of Oulu and later the same year he gained a professorship at the University of Helsinki.

"My aim in Helsinki was to take part in creating a fine department of mathematics and statistics, and the atmosphere in the department at the moment is indeed excellent. I have often seen departments elsewhere in the world that have fallen prey to squabbling and jealousy, but my experiences so far suggest that this department enjoys a spirit of mutual respect and openness. Now it is my intention, my plan and my dream to foster this magnificent spirit."

Professor Kuusi's field of research is nonlinear partial differential equations and the calculus of variations and probability, within which he has concentrated on regularity theory, potential theory and nonlocal problems. His most recent work has been concerned with stochastic homogenization, which studies the statistical properties of random partial differential equations, i.e. mathematical models in which random microscopic behaviour leads to macroscopic consequences. Tuomo Kuusi is engaged in studying a number

*Tuomo Kuusi has a substantial network of international collaborators*



of challenging mathematical problems and applying the resulting methods in practice. One example of a practical application consists of mathematical approaches and numerical methods connected with the exploitation of geothermal energy

"Developing mathematical methods is exasperating work in the sense that the predominant state of affairs is one of uncertainty and confusion. My own way of solving such problems could be termed 'erosion', as I attempt to break down the smoke-screen surrounding the core of the problem bit-by-bit until a clear, well-articulated core emerges."

Tuomo Kuusi has led a number of research projects financed by the Academy of Finland, and now has a Consolidator Grant from the European Research Council (ERC) for the period 2019–2023.

"My collaborators are extremely important to me. Relations of that kind take years to build up and in practice usually evolve into close friendship. Up to now I have been working most of the time with

theoretical issues, so that I have mostly remained within my own field at this early stage in my career, but in recent years I have actively sought cooperation outside the field of mathematics and I will probably place increasing emphasis on this in the future."

Tuomo Kuusi is an author of about 60 papers published in widely cited peer-reviewed journals, including a considerable proportion in the leading journals in his field. He has been an invited speaker at many international conferences and has a substantial network of international collaborators.

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

*Photo: Maarit Kytöharju / University of Helsinki*