VÄISÄLÄ PRIZE

Peter Liljeroth

The field of study of Professor Peter Liljeroth's (b. 1975) research team at the Aalto University's Department of Technical Physics is nanoscience: molecular-scale structures and their electronic properties. The tools they use for this are low-temperature tunnelling and atomic power microscopy. The group has gained a reputation for the controlled generation of nanostructures and their imaging and characterization. Liljeroth's measurements are capable of revealing the structures and electron densities of atoms and molecules with unprecedented accuracy.

Examples of the group's recent achievements include unidimensional graphene ribbons and combination structures manufactured to an accuracy of individual atoms by means of polymer reactions taking place on the surface of a growth medium. Another example is imaging and spectroscopy of individual atoms and molecules and the controlling of chemical reactions between these in order to synthetize the desired target molecules.

Peter Liljeroth is the leading nanoscientist of his generation and has received funding from the European Research Council (ERC) in the face of serious competition. His research has featured prominently in prestigious journals such as Nature and Science. "Science for me is the production of new knowledge motivated by curiosity," he maintains.

Nanotechnology is a vast area of research and is being studied intensively throughout the world at the present time. It is thus important to find a topic of research which is not being addressed elsewhere with massive resources. It is in this that our opportunities lie.

Liljeroth's interest is focused on the experimental production of graphene nanostructures of kinds that have been theoretically predicted to have unique properties although it has not previously been possible to demonstrate these experimentally. So far we have successfully produced simple grapheme nanoribbons, and now the challenge is to pro-

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duce more complex systems that nevertheless have a precisely defined structure.

Liljeroth warns against excessive enthusiasm regarding the future use of these molecules, e.g. as a substitute for silicon technology. “Ordinary computers will continue in the future to be made using silicon technology. Graphenes will be used for purposes where silicon technology is inapplicable.”

Liljeroth emphasizes the value of basic research in this respect. One object of especial interest in the near future will be whether it is possible to fabricate artificial materials by moving atoms to the desired positions in order to achieve precisely defined properties.

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