Media release

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Ruzicka-Prize 2013 awarded to Maksym Kovalenko

Master of the nanocrystals

The Ruzicka Prize 2013 has been awarded to Maksym Kovalenko, ETH Assistant Professor at ETH Zurich and Empa scientist. The Ukrainian has been very successful at investigating new nanomaterials for use in electronics, optics and batteries.

Maksym Kovalenko stands beside his desk, observing his visitor in a curious but reserved way. Like many offices in the finger dock of the HCI building, his room is unadorned and fairly small. It doesn't look like it has been properly set up yet; the 31-year-old Assistant Professor, who has been working at ETH Zurich since July 2011, has simply not had time for this. In addition to the one he is currently standing in, he has a second office at Empa, which means travelling back and forth between Hönggerberg and Dübendorf. Yet, this doesn't seem to stress him.

On the contrary, Kovalenko comes across as a calm, considerate, almost shy person of few words – until the conversation turns to his research. He pulls one of his new publications from a pile of special printings to help explain what he is working on: uniform nanocrystals made of tin, for instance, that could be used in batteries in the future. He is also very enthusiastic about the present work of his group on sodium-containing batteries, a viable low-cost alternative to the present-day lithium-based technology. He wants to create nanocrystals of a size and shape that can be used to significantly improve the energy density of rechargeable lithium-ion batteries. Above all his goal is to better understand and rationally design the surface chemistry of nanocrystals – as a gateway to their application in nearly every kind of solid-state technology such as electronics, photovoltaics and batteries.

In his young scientific career, Kovalenko has already made significant accomplishments, for which he has been awarded the Ruzicka Prize 2013 on 4 December. An honor that he is delighted to receive as –apart from an ERC Starting Grant in 2012 of 1.8 million Swiss francs – his first most momentous recognition after the start of his independent research career. "This prize really means a lot to me, especially when I reflect on the notable researchers who already received it", he says, observing the list of previous awardees.

Assistant Professor at 29

Kovalenko quickly established himself in the field of battery research as one of the first to use highly uniform nanocrystals. Research on battery materials was new territory for him when he took up his position at ETH Zurich and Empa. Previously, he had mainly researched the chemical processes that occur on surfaces. However, he emphasizes that he did not have to be asked twice to enter into battery research as the field fascinated him. Kovalenko found it both interesting and important, and recognised that the existing challenges can be addressed with the help of his previous experience in nanocrystal synthesis.

He was born in Ukraine in1982. There he completed his master's degree in inorganic chemistry at Chernivtsi National University. He then moved to the West to obtain his doctorate degree. At Johannes Kepler University in Linz (Austria), he received his PhD in nanoscience and nanotechnology in 2007. His doctoral thesis dealt with the synthesis of colloidal nanocrystals for their applications in infrared optical devices. He continued his career at the University of Chicago. There, he worked as a postdoc from 2008 to 2011 and developed new procedures that can be used to tailor the surface chemistry of colloidal nanostructures. With this he laid the foundation for new ways of using nanomaterials for electronics and optoelectronics. In 2011, he accepted a position at ETH Zurich, and since then has been Assistant Professor for Inorganic Chemistry in the Tenure Track process. His group's research is mainly done at Empa, in the Laboratory for Thin Films and Photovoltaics in Dübendorf.

Productive years

Kovalenko now leads a group of eight PhD students and five postdocs, most of whom joined the group in 2013. As a result, he is now much more involved in activities such as team organization and leadership than he was at the start of his career. Nevertheless, he tries to maintain personal contact with every one of his group members. "We've had a very productive year", he says with a mischievous smile, "but I think 2014 is going to be even better."

Ruzicka Prize

The prize, which is named after Nobel Laureate Leopold Ruzicka, has been awarded to young researchers who have made exceptional contributions in the field of chemistry. The Ruzicka Prize is made possible through funds from the Swiss chemical industry and, together with the Werner Prize, is the most important Swiss prize for promoting young researchers in chemistry. Its board of trustees has discovered many talents since it was first awarded in 1957: the list of recipients includes names such as Richard Ernst (magnetic resonance; Nobel laureate 1991) and Charles Weissmann (prion research).

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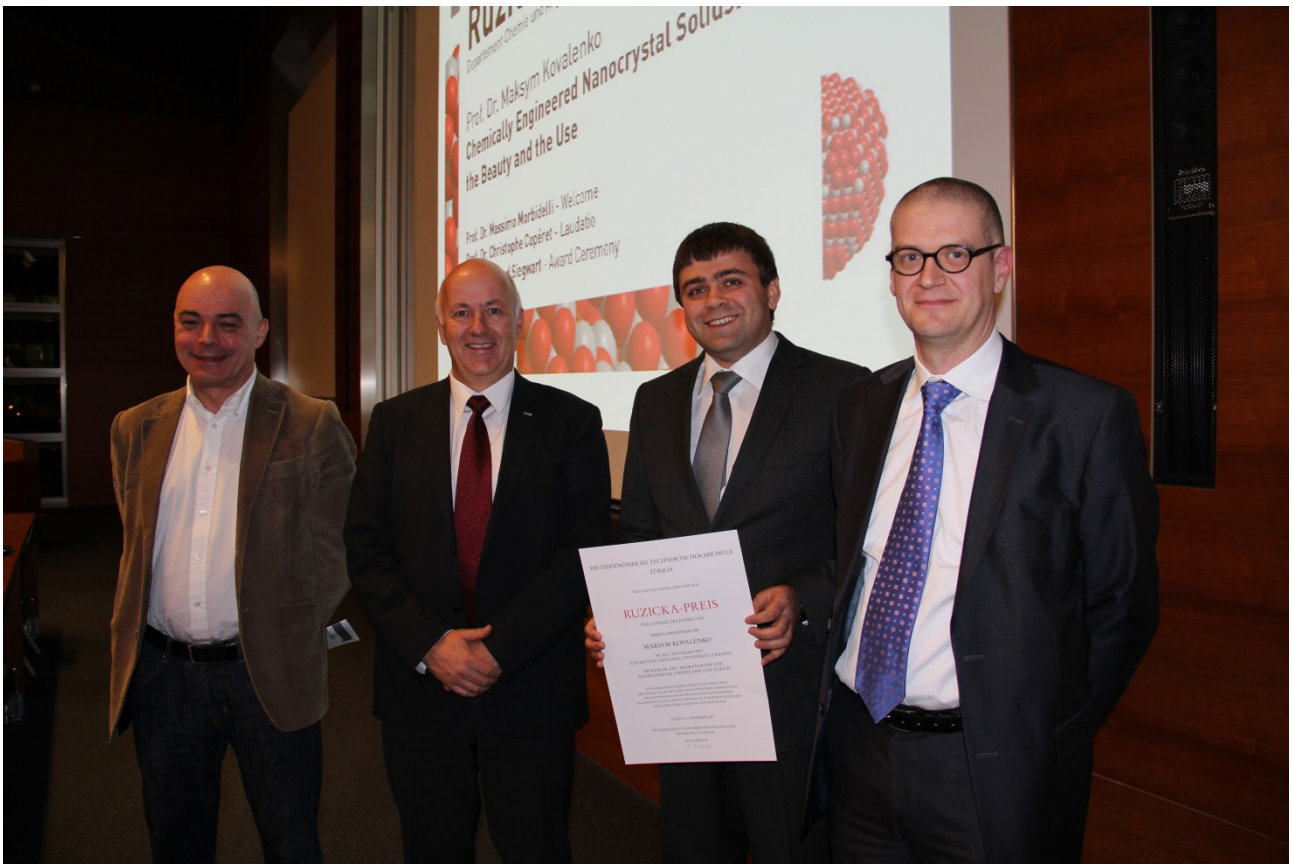

Massimo Morbidelli, Roland Siegwart, Maksym Kovalenko and Christophe Copéret (f.l.t.r.) at the award ceremony. (Photo: Barbara Brauckmann / ETH Zurich)