



DGE / The President

Deutsche Gesellschaft für Elektronenmikroskopie

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Press Release

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Cutting-edge Research using the Electron Microscope: Ernst Ruska Price 2011 for Researchers from Belgium and USA

Dr. Johan Verbeeck, Physicist from Antwerp (Belgium), and Prof. Dr. David Mastrorarde, Cell Biologist from Boulder, Colorado (USA), will receive the Ernst Ruska Price 2011 of the Deutsche Gesellschaft für Elektronenmikroskopie (DGE; German Society for Electron Microscopy), for their achievements in the field of Electron Microscopy, a research area that was initiated by the Nobel Prize Laureate Ernst Ruska. The Prize will be awarded on the Microscopy Conference in Kiel, Germany, on August 31st 2011, by Prof. Dr. Reinhard Rachel, from the University of Regensburg.

Although the two price winners work in two totally different areas, what they have in common is their keen interest in elucidating fine structures of materials under the electron microscope in as much detail as possible. Electron microscopes were initially invented and built in the 1930's by Ernst Ruska, Nobel Prize Laureate in 1986 for Physics, but their ultimate potential has not yet been fully exploited. In order to encourage and distinguish new developments in this field, the Ernst Ruska Price is awarded every two years by the DGE. **Johan Verbeeck**, physicist at the University of Antwerp (Belgium) developed a new method for the quantitative evaluation of energy losses by electrons interacting with matter. Analyses of electron energy losses make it possible to investigate the chemical composition of matter ultimately on an atomic scale, and also to characterize the bonding of atoms. The new method developed by Johan Verbeeck permits quantitative and unbiased data analysis. In addition, he recently demonstrated that it is possible to manipulate electron beams to follow a spiral path, known as vortex. Such electron waves are a new powerful tool that could be used to investigate magnetic structure in new storage devices, or to manipulate single atoms. **David Mastrorarde**, Professor at the Department of Molecular-, Cell- and Developmental Biology at the University of Boulder (Colorado, USA) has been developing new electron tomography programs for many

years. The programs facilitate the fully automatic generation of serial images from pre-defined angles, as well as enable the three-dimensional (3D) reconstruction and analysis of an object. The basics of some of these algorithms were already known from computer tomography (using X-rays), but as such not suitable for electron tomography: they needed to be adjusted comprehensively and fine-tuned in many important parts. David Mastronarde developed and wrote many new tools and modules. The program packages are available for free for different platforms and have found wide acclaim among specialists. As for other open platforms, the further development of the program modules is a two-way process between the developers in Boulder and a continually increasing number of users in a web-based forum.

The Prize-Winners:

Dr. Johan Verbeeck studied engineering, and finished his PhD in physics in Antwerp, Belgium, in 2002. After spending some time at the Technical University of Vienna, Austria (2006-2007) and at the University of Bremen in 2008, he is now working at the Electron Microscopy Centre for Material Science at the University of Antwerp, Belgium.

Prof. Dr. David Mastronarde did his bachelor in chemistry, mathematics and physics at the University of Amherst (USA). Later, he worked at the University of Boulder (Co, USA) in the field of the physiology of vision. In 1988, he finished his PhD in Biology and Neurophysiology. Since then, he is employed at the Boulder Laboratory for 3D Electron Microscopy of Cells. In 1995, he was appointed associate professor, and since 2001, he is Full Professor and co-director of this institute.

The Deutsche Gesellschaft für Elektronenmikroskopie e.V. (German Society for Electron Microscopy)

It is the aim of the DGE to support and advance electron microscopy and related scientific methods in basic research, in engineering, and in companies. The society offers support for all members, by organizing advanced training, scientific conferences, and facilitating international cooperation. The DGE was founded in 1949 in Düsseldorf, Germany, among others by Prof. Ernst Ruska, Prof. Ernst Brüche, and Prof. Bodo von Borries, three pioneers in the field.

The DGE has 650 members and organizes a national scientific meeting every two years. Since 1985, these conferences are organized every four years jointly with the corresponding societies from Austria and Switzerland, known as "Dreiländertagung Elektronenmikroskopie" (three-country electron microscopy conference).

Every two years, the DGE awards the Ernst Ruska Prize, and in addition a sponsorship award for a young scientist, and a technology award. These prizes are awarded to the recipients at the bi-annual scientific meetings. This year's conference will take place in Kiel, Germany, from August 28th until September 2nd, 2011. The Microscopy Conference 2011 is jointly organized by the Scandinavian Society for Microscopy SCANDEM, the Polish Society for Microscopy, and scientists from the Baltic countries and St. Petersburg (Russia).

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