

ÚSTAVNÍ SEMINÁŘ

v úterý dne 14. března 2017 v 15:00

v přednáškovém sále Fyzikálního ústavu AV ČR Na Slovance

Program:

Ondřej L. Křivánek

Electron-optical methods for molecular and atomic-level characterization

Monochromated, aberration-corrected scanning transmission electron microscopes (MAC-STEMs) are able to form intense electron probes as small as 0.5-1 Å in diameter, analyze single atoms spectroscopically (by electron energy loss spectroscopy (EELS) or energy-dispersive X-ray spectroscopy (EDXS)), detect vibrational EEL spectra, and perform many other types of experiments that we did not think would become possible as recently as 5 years ago.

Nion has pioneered many of these advances, by developing the first practical STEM aberration corrector, and subsequently a whole new electron microscope (the Nion UltraSTEM) that includes innovations such as very flexible electron optics, a corrector for all aberrations up to fifth order, an extremely precise and stable sample stage, and an ultra-high vacuum (UHV) sample chamber. The STEM is routinely able to image and individually probe single atoms while they remain in-situ, and to acquire large-area chemical maps at atomic resolution. In 2013 we introduced a new type of a monochromator, which allows materials to be probed by vibrational EELS carried out with better than 10 meV energy resolution and about 1 nm spatial resolution, as well as damage-free vibrational analysis in an “aloof” mode.

My talk will review these advances and illustrate them with practical examples.

Ondřej Křivánek, FRS, is the President of Nion Co. and Adjunct Professor at Arizona State University. He is well known for developing new techniques of structure research and for designing pioneering instruments, including simple-to-operate serial and parallel detection electron energy-loss spectrometers (EELS), post column-imaging filters, the first working aberration corrector for a scanning transmission electron microscope, an advanced aberration-corrected electron microscope (the Nion UltraSTEM), and a revolutionary electron monochromator. Dr. Křivánek has also initiated the development of DigitalMicrograph software for electron microscopy (in the 1980s, as the director of R&D at Gatan) and more recently, Python-based, open-source Swift software at Nion. 19 years ago, Ondřej Křivánek and Niklas Dellby founded Nion Co., which went on to develop STEM instruments that feature many important new capabilities and other advances. His papers and book chapters have been cited over 7000 times, and he is a Fellow of the Royal Society, the American Physical Society, the British Institute of Physics, the Microscopy Society of America, and an Honorary Fellow of the Royal Microscopical Society and of Robinson College in Cambridge.

Seminář proběhne v anglickém jazyce.

prof. Jan Řídký, DrSc.
ředitel

Colloquium of the Institute of Physics CAS

on Tuesday, March 14th, 2017 from 15:00

in the lecture hall of the Institute of Physics Na Slovance

Programme:

Ondřej L. Křivánek

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The colloquium will be held in English.

Prof. Jan Řídký
Director