Charles University
Faculty of Mathematics and Physics

Cordially invites you to

26th Strouhal's Lecture

NONCONTACT ATOMIC FORCE MICROSCOPY: IMAGING AND MANIPULATING SINGLE ATOMS AND ELECTRONS

Given by

doc. Mgr. Martin Setvín, Ph.D.
(Department of Surface and Plasma Science,
Faculty of Mathematics and Physics,
Charles University)

On Wednesday, 1 March 2023 at 1 p.m.

The lecture will be held in
the Jarnik´s auditorium (M1),
Prague 2, Ke Karlovu 3

The lecture will be also streamed at:

Zoom Meeting ID: 965 6406 8254
Passcode: 026087

click here

doc. Mgr. Martin Setvín, Ph.D. (*1982) is an associate Professor at the Department of Surface and Plasma Science, MFF UK. He obtained his Master and PhD degree in Surface Physics there and spent eight years at TU Wien as an assistant Professor, one year in Japan at NIMS and one year at the Institute of Physics at the Czech Academy of Sciences. His research focuses on surface characterization by scanning probe methods and on development of novel approaches based on noncontact atomic force microscopy. After returning to MFF UK, he established his own laboratory thanks to the support from GACR EXPRO and GAUK PRIMUS projects.

Abstract
Transition metal oxides represent a technologically important class of materials, which play a key role in catalysis, electronics, energy harvesting and energy storage. The key processes typically occur at the surface and the atomic-scale analysis is invaluable for developing new technologies. Recent advances in noncontact atomic force microscopy offer novel ways for surface analysis. This talk will demonstrate the new opportunities for deciphering the surface structure of various crystalline materials such as In_2O_3 or the $SrTiO_3$ perovskite, as well as amorphous copper oxide layers. The superior sensitivity in force detection allows going beyond simple imaging of the atomic structure and allows for detecting and manipulating single electrons in solids. This is used for studying the kinetics of electrons and holes self-trapped in ionic lattices, so called polarons.