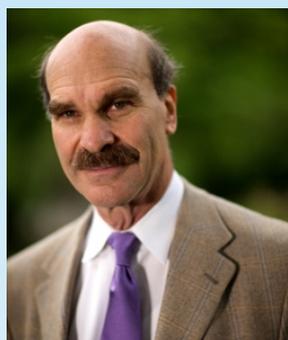


# REGIONAL CENTRE OF ADVANCED TECHNOLOGIES AND MATERIALS

## RUDOLF ZAHRADNÍK LECTURE

General Director of RCPTM cordially invites you to the lecture  
in the framework of **RUDOLF ZAHRADNÍK LECTURE SERIES**

This talk will be delivered by



**Prof. Mark A. Ratner**  
(Northwestern University)



**NORTHWESTERN**  
UNIVERSITY

### „Molecular Mesoscopics: Transport in Molecular Junctions”

**Monday, November 25, 9:30, assembly hall of Faculty of Science,  
17. listopadu 12, Olomouc.**

**Mark Ratner** is Dumas University Professor at NU. Ratner is interested in structure and function at the nanoscale, and theory of fundamental chemical processes. Some principal areas of interest are molecular electronics, theories of self-assembly, nonlinear response in molecules, and exact and approximate theories of quantum dynamics. Specific hot topics at the moment include interference properties and coherence in chemical dynamics, microscopic modeling of electrochemical redox processes, optimization of organic solar cells, energy transduction and electronic motion in nanodot/molecule composites, and molecular spintronics. His newest interest is in using nanoscience to attack the energy problems facing this world.

Mark Ratner is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the International Academy of Quantum Molecular Sciences and the Royal Danish Academy of Sciences. He received the Langmuir Award, The Gibbs Medal and the Feynman Award. He has honorary doctorates from the University of Copenhagen and from the Hebrew University of Jerusalem. He has twice chaired the Chem. Department at Northwestern, has been on the Faculty Teaching Honor Roll at Northwestern eleven times, and taught roughly five thousand students in General Chemistry in the last dozen years.

**Abstract:** The two phenomena of electron transfer in molecules and electron transport through molecules are closely related to one another. Some of the phenomena exhibited in one of these areas can be mirrored in the other, but there are also differences. In this talk, we discuss the transport situation and different mechanisms for transport that occur under different temperature conditions and with different molecular structures. In particular, we will examine transport through more complex organic molecules than usual, and the interference phenomena that can result from cross-coupling, from meta linkages, and from simultaneous transport through more than one molecule. Emphasis will be conceptual (no complicated equations, no harping on methodology), and some concepts of physical organic chemistry, and their relationship to transport, will be addressed.