

# EINLADUNG

zum

# VORTRAG

von

**Dr. Tonči Tadić**

Ruđer Bošković Institute, Zagreb, Croatia

## **MeV SIMS – an Introduction**

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## MeV SIMS – an Introduction

Dr. Tonči Tadić, Ruđer Bošković Institute, Zagreb, Croatia

[Tonci.Tadic@irb.hr](mailto:Tonci.Tadic@irb.hr)

### Abstract

MeV SIMS - molecular imaging by mass spectrometry of secondary molecular ions, resulting from MeV ion irradiation of materials, is a promising tool and becoming increasingly important for surface characterization of organic materials, enabling molecular analysis and molecular imaging of materials. Since the yield enhancement by MeV ion impacts compared to the conventional SIMS is still not well understood, the matrix-assisted laser desorption/ionization (MALDI) has often been used for visualization of molecular distributions in organic materials, although in most cases a lateral resolution of MALDI imaging is more than several tens micrometers. On the other hand, secondary ion mass spectroscopy (SIMS) using primary ions in keV energy range provides good lateral resolution (often better than micrometer), although its application is limited by low secondary ion yields of high-mass molecules. Using focused MeV heavy ions as primary ions is a different approach to molecular analysis and molecular imaging of (organic) materials, with the benefits in higher yield of high-mass molecules (in some cases for three orders of magnitude higher compared to conventional SIMS using keV primary ions). Besides, ion micro-beams employing MeV heavy ions with submicron lateral resolution are in routine use at several ion accelerator facilities in the world. Coupling of time-of-flight (TOF) setup for detection of high-mass molecules with heavy ion micro-beam therefore offers a possibility for a significantly better molecular imaging and mapping.

### CV

Tonči Tadić born 1962 received his BSc in 1987, his MSc in 1992 and PhD in Physics in 1995 from the Ruđer Bošković Institute and University of Zagreb, Croatia. He is research associate at Ruđer Bošković Institute (RBI), Zagreb, Croatia. His research interests include interactions of accelerated ions with materials, ion beam analyses and ion beam modification of materials. He has published 31 journal papers in these areas of research.

Tonči Tadić from RBI and Jiro Matsuo from Kyoto University were leaders of Croatian and Japanese groups, respectively, in bilateral Croatian-Japanese project „Enhanced Molecular imaging by swift heavy ions“ 2010-2013, as a part of Strategic Japanese-Croatian Cooperative Program on Materials Science.

In 1997-1998 Tonči Tadić was guest-researcher at ONRI-AIST, Ikeda, Osaka, Japan as STA post-doctoral fellow. He is recipient of Japanese Order of the Rising Sun.

He was Member of Parliament of Croatia (Hrvatski Sabor) 2000-2008, is coordinator of Croatian nuclear fusion research programme, member of General Assembly of the EUROFUSION Consortium, member of „Fusion for Energy“ Governing Board (F4E GB), and member of Euratom Programme Committee Fusion.

In July 2013 EC appointed Tonči Tadić for a member of Euratom Scientific and Technical Committee (STC).