



**October, 21-24, 2014 - Natal - Brazil**

1st Iberoamerican Congress on Surface, Materials and Vacuum Applications

**ICSMVA**

&

35<sup>th</sup> Brazilian Congress of Vacuum Applications in Industry and Science

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**AND SHORT COURSES!!**

# **INVITED LECTURES**

## **INVESTIGATING AND ENGINEERING BIOMOLECULAR INTERFACES**

**Mariano Anderle (IUVSTA-Italy)**



Scientific Director of the International Union for Vacuum Science Techniques and Applications (IUVSTA), Fellow AVS 2003, Past President of the Italian Society for Science and Technology (AIV), since May 1<sup>st</sup>, 2009 is Responsible of the Special Project “Promotion and internalization of the Trentino Research System” at the Department of Innovation, Research and ICT of the autonomous province of Trento, Italy.

He has also been active in international professional circles, including serving as Councilor for Italy, Vice-chair of Applied Surface Science Division Committee, Chair of Congress Planning Committee, and Chair of the Biomaterials Interface Steering Committee of IUVSTA and organizer for numerous International surface analysis and engineering activities.

## **ATMOSPHERIC PRESSURE PLASMA SOURCES AND THEIR APPLICATIONS**

**Hana Barankova (UPPSALA UNIVERSITY – Sweden)**



Professor at the Uppsala University, Sweden and director/manager of several projects/centers on energy and environmental applications of plasma. She graduated from the Czech Technical University, Faculty of Nuclear Sciences and Engineering Physics in Prague and received her PhD degree in Electronics and Vacuum Technique from Czech Academy of Sciences. Her primary interests are development of plasma sources and processes at reduced and atmospheric pressures, innovation in coating technology and plasma treatment of surfaces, gases and liquids. She has published over 170 papers, conference contributions and book chapters and holds several industrial patents on plasma systems, some of them licensed or assigned to industry. She runs two companies, BB Plasma Design AB and BB Plasma HB.

## NON-EQUILIBRIUM ATMOSPHERIC PRESSURE PLASMA JETS: DIAGNOSTICS AND PLASMA-BIO INTERACTIONS

Peter Bruggeman (University of Minnesota Twin Cities – USA)



Researcher of Department of Mechanical Engineering, **University of Minnesota**. Msc. Physics, 2005, Msc. Engineering: Applied Physics 2005, PhD, Applied Physics, 2008, Ghent University, Belgium

Primary research interests are in plasma processes for environmental, biomedical and renewable energy technologies. In these processes the unique large reactivity of atmospheric pressure non-equilibrium plasmas in their interaction with matter is investigated. Recent work is concerned with research and characterization of novel medical plasma devices for wound healing, optimizing and investigating plasma technologies for disinfection, environmental remediation and conversion processes for energy applications. These studies include laser induced fluorescence, optical emission spectroscopy, laser scattering, absorption spectroscopy and mass spectrometry to measure plasma properties and reactive species densities. Further research interests are in plasma chemistry, plasma-liquid interaction and plasma synthesis processes.

## ATMOSPHERIC PRESSURE PLASMAS: FROM NANO-SYNTHESIS TO DEVICES

Davide Mariotti (University of Ulster – UK)



Plasma scientist Dr Davide Mariotti has been awarded a Distinguished Research Fellowship by the University of Ulster. Since joining the University of Ulster as a Reader in 2009, Dr Mariotti has been a member of the Engineering Research Institute and has taken an active part in the international research community. This has been demonstrated by two recent invited papers, an Invited Topical Review “*Microplasmas for nanomaterials synthesis*” and a Perspective Paper “*Perspectives on atmospheric-pressure plasmas for nanofabrication*” which are clear indications of his world-leading role in the field of plasma nanofabrication. Dr Mariotti has increased his h-index from 5 to 18 in only four years since joining Ulster. Citations to his work have seen an exponential increase with already more than 180 citations for 2012. This is further demonstrated by invitations received to prominent international conferences and his growing number of keynote lectures.

## **NEW METHODS FOR CONSTRUCTING METALLIZED ORGANIC SURFACES**

**Amy Walker (University of Texas at Dallas – USA)**



Associate Professor of Departamento of Materials Science and Engineering (University of Texas at Dallas). The ultimate goal of Amy Walker's research is the development of simple, robust materials for constructing complex two- and three-dimensional surfaces by manipulating interfacial chemistry. Metal/SAM, semiconductor/SAM and biomolecule/SAM structures have applications in organic electronics, sensing, catalysis, photovoltaics and optoelectronics. Her group also develops analytical techniques to probe the structures produced. The Walker group employs surface science techniques, in particular time-of-flight secondary ion mass spectrometry (TOF SIMS) and reflection absorption infrared spectroscopy (RAIRS) and calculations of molecular structure (density functional theory, DFT) in this work. TOF SIMS is a unique widely applicable technique that provides detailed information about the chemical composition of surfaces with sub-micron lateral resolution, and is used in areas from biological systems to materials science.

## **PREPARATION OF FUNCTIONALIZED SURFACES BY NON EQUILIBRIUM PLASMAS**

**Francesco Fracassi (Università Di Bari – Italy)**



Graduated in Chemistry at University of Bari. Since January 2004 he is full professor of General and Inorganic Chemistry at the Department of Chemistry of University of Bari Aldo Moro. In November 2010 he was elected chair of the Department of Chemistry and in November 2012 he became member of the Academic Senate of the University of Bari. The research activity concerns essentially on the investigation of non equilibrium plasmas and on the innovative processes which can be carried out with this kind of plasmas. These reactive systems allow to perform reactions and processes of interest in various industrial fields such as microelectronics, biomaterials, sensors, air purification, etc.. The cold plasmas or non-equilibrium plasmas or glow discharges are of great scientific interest because they are not characterized by thermodynamic equilibrium between the various degrees of freedom.

## ANALYSIS OF SURFACE/BIOMOLECULES INTERACTIONS

Anouk Galtayries (Chimie Paris Tech – France)



**Associate Professor in Chemistry**, Ecole Nationale Supérieure de Chimie de Paris (Chimie Paristech), **Laboratoire de Physico-Chimie des Surfaces** (UMR CNRS-ENSCP 7045)

**Research fields:** surface reactivity of passivated metals and alloys : biointerfaces, corrosion, oxidation

**Scientific publications and communications**

1. **author or co-authors** of more than **60 papers** (and 15 proceedings) ; h = 17.
2. **authors or co-authors** of more than **120 scientific communications** (oral or poster papers) in national and international conferences.
3. **co-editor** des *Proceedings of the 9th European Conference on Applications of Surface and Interface Analysis: ECASIA'01*, Surface and Interface Analysis, Wiley, 34, (2002).

**Leader of “Biointerfaces, biofilms, biomaterials” research team**

## DNA BIOINTERFACES: FROM MODEL SYSTEMS TOWARD BIO AND BIO-NANO APPLICATIONS

Dmitri Petrovykh (INL – Portugal)



Ph. D. in Physics from the University of Wisconsin and joined the University of Maryland, initially to develop passivation and functionalization of semiconductor surfaces for chemical and biological sensing. His pioneering work in establishing quantitative analysis of DNA films has been recognized in 2003 by the Best Paper award from the international Surface Analysis conference. In 2011, Dr. Petrovykh became a Principal Investigator at INL, where his work in the area of nanobiotechnology is focused on the rational design and quantitative analysis of biointerfaces. He is particularly interested in elucidating the interactions between biomolecules and surfaces, which are important in biosensors, microarrays, programmed self-assembly of nanostructures, and bioinspired materials.

# **SHORT COURSES**

**1. THIN FILMS: deposition, characterization and applications**

**2. THERMOCHEMICAL TREATMENTS AIDED BY PLASMA TECHNIQUES**

**3. TECHNIQUES OF BASIC AND ADVANCED VACUUM**

**4. PREPARATION, CHARACTERIZATION AND APPLICATIONS OF NANOMATERIALS**

**5. PLASMA PHYSICS - FUNDAMENTALS AND APPLICATIONS**

**6. VACUUM FOR ELEMENTARY, MIDDLE OR HIGH SCHOOL TEACHER**