



Call for Abstracts and Papers

Symposium B: Advanced Functional Materials for Environmental Monitoring and Applications

E-MRS - Spring Meeting 2014, May 26 - 30, Lille Congress Center, France

Background

About three quarters of the European population lives in urban areas. The urban environment has a profound effect on people's health and well-being. Environmental sustainability of the urban society is a key issue in the era of smart cities and information services for the quality of life. Solid state sensors based on functional materials have been developed for several decades and recent improvements in nanotechnology and multifunctional materials have opened up the possibility to develop a new generation of sensitive, selective and stable sensors, with largely improved capacity to give relevant information both on a personal level and system levels.

The **COST Action TD1105 EuNetAir** is a science and technology running platform involved as European Network in the New Sensing Technologies for Air Pollution Control and Environmental Sustainability.

Scope of the Symposium

Air quality takes a prominent position in discussions on urban environment and health, and it is a concern for many inhabitants of urban areas. Nanotechnologies including nanostructured materials for sensing, chemical sensors, portable systems and commercial devices give a challenging opportunity to create a new generation of nanosensors for air quality control. Functional nanomaterials (i.e., nanowires, nanotubes, graphene, nanoparticles of metal-oxides, carbon-nanostructures, large band-gap semiconductors, and metals) with new sensing properties (detection at ppb-level, high sensitivity and selectivity), self-heating and durable operations for low powered (tens of μ Watt to tens of mWatt) devices are potential key elements in advanced air quality measurements for indoor and outdoor air quality monitoring.

Modeling provides a tool for nanomaterials tailor-made for specific purposes and applications. In order to realize functional, sensor-systems improvements in packaging, testing and aging are also very important and a focus area of this conference as current research hot-issues.

Nanotechnologies offer a big challenge to create innovative low-cost nanosensors for air quality monitoring. Functional nanomaterials (one- and two-dimensional nanostructures of carbon, graphene, metal-oxides, metals, polymers, supramolecular materials, self-organized materials, organic/inorganic materials, hybrid composites) with new tailored properties are key-issues for the development of low-powered devices for indoor and outdoor air quality monitoring, including practical applications such as geo-tagged database collected by networked stationary or mobile smart devices to address new sensing concepts for novel air quality monitoring and mapping techniques of gas molecules and particulate matter. These solid-state chemical sensors based on smart materials are useful for real deployment and complementary to the existing official high-cost high-quality air-quality monitoring stations used by public authorities, scientists or community groups.

Many worldwide investigators are involved in research in materials physics/chemistry and engineering, including nanosciences and nanotechnologies for sensing applications. Current international research includes the design and synthesis of organic, inorganic, polymers, and hybrid materials, the development of biomimetic materials and biomaterials, the discovery of new organometallic catalysts, the synthesis of nano- and mesoscopic materials including raw materials, the preparation of multilayers and multifunctional coatings, the study of chemistry of surfaces and interfaces, the exploration of the sensing properties of reactive materials, the characterization of the matter at nanoscale level for deep insights, the photo-physical study of supramolecular materials and the demonstration of functional nano/micro systems.

Basic research on sensing mechanisms and gas/surface interaction is critical for advancements in materials science and nanosensors in order to address practical applications in the field of the environmental monitoring, safety, security, healthcare, automation, green buildings, energy efficiency, transportations, food quality, industrial process control.

This **Special Issue** in *Journal of Sensors and Sensor Systems* (JSSS) will consolidate the research in the newly emerging area of environmental sensors. Authors are invited to submit papers on the theoretical, technological and experimental aspects of the design, development, and validation of various types of novel sensors printed on diverse substrates, e.g. planar substrates, plastic, metal foils, paper etc. Submission of research/review papers is particularly encouraged.

Hot Topics covered by the Symposium

- Advanced gas sensing semiconducting materials
- Hybrid materials and nanocomposites for gas sensing
- Catalytic sensing materials
- Device fabrication, packaging, testing and aging
- New (nano)sensors for monitoring gaseous and liquid pollutants
- Ab initio modeling of gas/surface interaction
- Surface-sensitive spectroscopies for studying sensor/gas interaction
- Modeling of materials, devices and sensor systems
- Functional applications

Tentative List of Invited Speakers

- **Silke Christiansen** (Max-Planck Institute, Erlangen, Germany) “*Nanomaterials for sensing and energy applications*”
- **Martin Eickhoff** (University of Giessen, Germany) “*Novel optochemical nanosensors*”
- **Hossam Haick** (Technion, Israel Institute of Technology, Haifa, Israel) “*Hybrid Nanomaterials for Non-Invasive Diagnosis of Disease via Volatile Biomarkers*”
- **Jing Li** (NASA, Ames Research Center) “*Carbon Nanotube based Chemosensor Development and Smart Phone Applications*”
- **Juan Ramon Morante** (IREC, Barcelona, Spain) “*Metal-oxides nanowires for gas sensing applications*”
- **Ruth Pearce** (NPL, National Physics Laboratory, London, UK) “*Graphene, material characterization and sensor development*”
- **Reginald Penner** (University of California Irvine, USA) “*Sniffing molecules with metal nanowires*”
- **Ping Wang** (Zhejiang University, China) “*Biomimetic cell and tissue biosensors for environmental monitoring*”

Depending on the number of submitted abstracts and on the topics covered by the abstracts, the list will be completed by other **Invited Talks** selected from submitted oral contributions.

Important Dates

January 16, 2014:	Deadline for Abstract Submission (1500 characters, no figures) to E-MRS server
February 28, 2014:	Authors Notification
March 31, 2014:	Completion of Scientific Program
May 26-30, 2014:	Symposium B at E-MRS 2014 Spring Meeting 2014 in Lille (France)
June 15, 2014:	Deadline for Paper Submission to Journal of Sensors and Sensor Systems (JSSS)
December 2014:	Publication of Proceedings as Special Issue JSSS

Symposium Organizers and Guest Editors

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Submission of Abstracts and Peer-Review of Extended Papers

All **Abstracts** (max 1500 characters, no figures, no formulae) must be submitted to E-MRS 2014 server (Symposium B) within the deadline of **16 January 2014** by the electronic manner at the following weblink: http://www.emrs-strasbourg.com/index.php?option=com_content&task=view&id=409&Itemid=152.

The authors of the accepted abstracts will be invited to submit Extended Papers to Open Access **Journal of Sensors and Sensor Systems** (JSSS), Copernicus Publications. All **Extended Papers** shall undergo the standard Journal of Sensors and Sensor Systems peer-review process. Manuscripts must be submitted on-line, by deadline of **15 June 2014**, via the *JSSS Manuscript Submission*, see http://www.journal-of-sensors-and-sensor-systems.net/submission/manuscript_submission.html.

When submitting, please indicate in the “Manuscript Type” roll down menu, and also by e-mail to Michele Penza, michele.penza@enea.it, that the paper is intended for the “*E-MRS 2014 Spring Meeting 2014, Symposium B*” Special Issue. Authors are particularly encouraged to suggest names of potential reviewers for their manuscripts in the space provided for these recommendations in *Manuscript Submission*.

For manuscript preparation and submission, please follow the guidelines and template in the *Information for Authors* at the JSSS Journal webpage, http://www.journal-of-sensors-and-sensor-systems.net/submission/manuscript_preparation.html.