Nanomaterials and Nanotechnology for Trace Level Detection

Technical Programme

Overview

The Short Course will cover basic concepts of nanomaterials and Microsystems technologies for a successful integration in functional devices. It will review state of the art technology and methods for trace level detection. An introduction to growth and characterisation of nanostructures will deliver hands on experience. Students may show their own results since a poster session will be organised. This will give an opportunity to build personal networks and meet active researchers, both from academia and industry, who are advancing in the field.

The School is ideal for anyone with an interest in nanotech sensors and in trace level detection and is new to the field; for example, PhD students, researchers, technologists and industrialists. Short Courses organized by ISOCS are a unique combination of fundamental theory lectures and practical application exercises. They provide a head start into selected topics of current research and new developments in the area of chemical sensing and olfaction. Most lecturers will be present throughout the duration of the course and a poster session will be organized for students to have an active participation. Therefore, ample opportunity is given for discussion and networking.

The Short Course is residential and the programme allows plenty of scope for networking with lecturers and attendees. Lectures take place in the morning and afternoon with the evenings free to network, consolidate their knowledge or enjoy the outdoors (Roman and Medieval Tarragona or its beaches).

The venue is the Science and Technology Campus of the University of Tarragona. Accommodation, breakfast, coffee breaks and lunch are included in registration fee.

School Director:	Prof. Eduard Llobet	University of Tarragona, Spain
Additional Lecturers:	Prof. Santiago Marco	University of Barcelona, Spain
	Prof. Julian Gardner	University of Warwick, UK
	Dr. Eduard Figueras	CNM Barcelona, Spain
	Dr. Wolfgang Vautz	ISAS Dortmund, Germany
	Dr. Karine Bonnot	ISL Saint Louis, France

For further information visit: **www.olfactionsociety.org/summercourse2012/**

ISOCS Short Course
4 - 7 June 2012 – Tarragona, Spain

Schedule

Monday 4th June

19:00	Registration	
19:30	Buffet reception	

Tuesday 5th June

09:00 – 09:55	Lecture1: Overview of trace detection	**Julian Gardner**
10:00 – 10:55	Lecture 2: Pre-concentration and sample handling	**Julian Gardner**
11:00 – 11:55	Coffee break and poster set-up	
12:00 – 12:55	Lecture3: Food and medical applications of trace detection: Beer taints and urine analysis	**Julian Gardner**
13:00 – 14:00	Lunch	
14:30 – 15:25	Lecture 4: Detection of trace vapors of chemical warfare and explosives. Overview.	**Karine BONNOT**
15:30 – 16:25	Lecture 5: Applications of nanomaterial based technologies: sensing TNT and DMMP in air.	**Karine BONNOT**
16:30 – 17:30	Tour of the labs and facilities	
17:35 – 18:35	Around the posters / networking time	
Adjourn		
	(Dinner on your own)	

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Wednesday 6th June

09:00 – 09:55	Lecture 6: Basics of Ion Mobility Spectrometers	**Wolfgang Vautz**
10:00 – 10:55	Lecture 7: Miniaturised IMS. Potential and challenges	**Wolfgang Vautz**
11:00 – 11:55	Coffee break and poster flash presentations	
12:00 – 12:55	Lecture 8: Nanomaterials	**EduardLlobet**
13:00 – 14:00	Lunch	
14:30 – 15:25	Lecture 9: Integration of NM in functional devices	**EduardLlobet**
15:30 – 16:25	Lecture 10: MEMS based technologies	**E. Figueras**
16:30 – 17:30	Around the posters / networking time	
Adjourn		
19:00	Walking tour of Roman and Medieval Tarragona (Dinner on your own)	

Thursday 7th June

09:00 – 09:55	Lecture 11: Optical methods for trace-level detection	**E. Figueras**
10:00 – 10:55	Lecture 12: Signal processing for IMS devices	**Santiago Marco**
11:00 – 11:55	Coffee break and poster flash presentations	
12:00 – 12:55	Lecture 13: Signal processing for IMS devices	**Santiago Marco**
13:00	Informal farewell and lunch	

About the lecturers:

Eduard Llobet is Professor of Electronic Technology in the Electronic Engineering Department at Tarragona University and heads the Research Centre on Engineering of Materials and micro/nanosystems (EMaS). His research interest include the development of nano gas and biosensors using low-dimensional metal oxides, nano-wires and nanotubes, and artificial olfaction and taste for food, health and medical applications.

Karine Bonnott is a researcher at the French-German Research Institute of Saint-Louis (ISL). She received her Ph.D. degree in Chemical Engineering from the National Polytechnic Institute of Lorraine in 2003, and has a strong experience in trace chemistry. She joined NS3E in 2008, where her research interest are the tunable generation of explosive vapors, analytical means for their sensitive and reliable detection at a molecular level, and the comprehensive study of sensing processes. She is the author of over twenty publications in peer-reviewed journals and communications in ultra-traces detection of explosives and atmospheric pollutants, and in competitive gas-solid adsorption.

Wolfgang Vautz is Senior Scientist at Leibniz-Institute for Analytical Sciences ISAS e.V., Dortmund Germany. He is in the board of directors of the International Society of Ion Mobility Spectrometry and he is Editor of the International Journal of Ion Mobility Spectrometry. Since more than 10 years his focus is on the development of ion mobility spectrometers for process control and for biological and medical applications. Current research interests include the implementation of instruments for medical diagnosis and on the investigation of ionisation processes.

Julian Gardner is Professor of Electronic Engineering in the School of Engineering at Warwick University, UK. He is a Fellow of the Royal Academy of Engineering and has worked with more than 25 companies in the past 20 years developing CMOS gas sensors and electronic noses. His current research interests include the fields of smart sensors, biomimetic MEMS devices, and artificial olfaction.

Santiago Marco is Associate Professor at the Department of Electronics at the University of Barcelona and heads the Artificial Olfaction lab at the Institute for Bioengineering of Catalonia.. His research concerns the development of signal/data processing algorithmic solutions for smart chemical sensing based in sensor arrays or microspectrometers integrated typically using Microsystem Technologies.(more at http://www.ibecbarcelona.eu/artificial_olfaction).

E. Figueras received his PhD in Physics from the Universitat Autònoma de Barcelona, Spain, in 1988. Until 1998 as Clean Room Manager at CNM he supervised all technological processes developed at CNM and was responsible of the standardization of all new fabrication processes. Since 1999, he has been working at the Microsystems and Silicon Technologies Department in the field of gas sensors. He is currently working on the developement of micromachining resonant devices to be used as gas sensors.