

Australia Advancing in Micro and Nanotechnology

-Highlights of SPIE International Symposium on Microelectronics, MEMS and Nanotechnology Held on Dec.11-15th 2005, Brisbane, Australia-

The 2005 SPIE Asia Pacific micro- and nano- technology conference was held in Brisbane hosted by the Queensland University of Technology (QUT) on Dec11-15th.. SPIE started its first Far East and Pacific Rim Symposium in 1997 in Adelaide hosted by University of South Australia titled Smart Materials, Structures, and MEMS sponsored by the Australian Defence Science and Technology Organization (DSTO, which sponsored most of the SPIE conference in Australia), the Microelectronics Center (MEC) and SPIE, since then from 1999, it became an annual event on micro and nano technology in Australia held at different cities in Australia including Melbourne (2000, Swinburne University of Technology), Adelaide (2001, Adelaide University), Melbourne (2002, RMIT), Perth (2003, The University of Western Australia), Sydney (2004, University of New South Wales), Canberra (Australian National University). The theme of each symposium has been related to MEMS, Smart Materials, Smart Systems, Microelectronics and Nanotechnology, and each year there is a different focus depending on the organizer and the conference chair. It is usually held during mid Dec. except in 1998 (none) and 1999 (held on Oct 27-29th in Gold Coast sponsored Queensland Government).

This SPIE conference has become increasingly popular especially attracting increasing number of papers and attendants from Asian countries. In 2005 the number of registered participants reached over 340 (15% increase from 2004) from 31 countries. The majority of participants (70%) is obviously from Australia and next is from Japan.

The symposium has a multidisciplinary tradition and the 2005 event consists of 5 thematic conferences held during Dec 12-14th 2005:

1. Microelectronics: Design, Technology, and Packaging
2. BioMEMS and Nanotechnology
3. Device and Process Technologies for Microelectronics, MEMS, and Photonics
4. Photonics: Design, Technology, and Packaging
5. Complex System

All the conferences consist of oral and poster presentations and were held in parallel.

The Complex System conference is new and the Exhibition area is also newly introduced. There were 7 exhibitors including Queensland University of Technology, Coherent Scientific, Australia Microelectronics Centre, Realtek Technologies, Bandwidth, Dyesol, and nanoTechnology systems.

The event provided training course workshops including AFM Fundamentals Workshop on Day One and AFM/STM Advanced Techniques Workshop on Day Five. A special workshop on Silicon Carbide Microtechnology was organized at the Queensland Microtechnology Facility located at Griffith University newly funded by the Queensland government.

Details about the event program and authors can be viewed at SPIE website spie.org/events/au.

The main nanotech centers, major facilities and companies are summarized in Table 1, 2 and 3.

Name	Location	Area	Website
Nanoscale Science and Technology Centre (NSTC)	Griffith University (GU), Brisbane	Materials, microelectronics, electronics, sensors	www.gu.edu.au/centre/NSTC
Australian Institute of Bioengineering and Nanotechnology (AIBN)	University of Queensland (QU), Brisbane	Materials, Biotech, Biosensors	www.aibn.uq.edu.au
ARC Center for Functional Nanomaterials	UQ, Brisbane	Materials, biosensing, fuel cells	www.arccfn.org.au
ARC Center of Excellence for Quantum Computer Technology	UQ, Brisbane	Quantum electronics, quantum theory	www.uq.edu.au/solutions/unit/cqct.html
Centre for Nanotechnology and Biomaterials	UQ, Brisbane	Biomaterials, diagnostic sensors, DNA sequencing	www.chemistry.uq.edu.ac/nbc
Centre for High Performance Polymers (CHPP)	UQ, Brisbane	Biopolymers, nanostructured polymers, industrial polymers	www.cheppe.uq.edu.au/chpp
Cooperative Research Centre for Cast Metals Manufacturing (CAST)	Brisbane	Metals, casting, alloy	www.cast.crc.org.au
Queensland University of Technology (QUT)	QUT, Brisbane	Materials, photovoltaic, water treatment, thin film deposition, surface characterization	www.bee.qut.edu.au

Table 1. List of Nanotech Key Centers in Brisbane

Name	Location	Area	Website
Center for Microscopy and Microanalysis	UQ, Brisbane	Materials, facility, service	www.uq.edu.ac/nanoworld
Brisbane Surface Analysis Facility (BSAF) and Future Materials	UQ, Brisbane	Facility, materials, characterization	www.chemistry.uq.edu.ac/bsaf
Queensland Microtechnology Facility	GU, Brisbane	Silicon carbide, microtechnology, power device, MEMS, memory elements	www.griffith.edu.au/centre/qmf
Australia Microelectronics Center	Brisbane	Facility, microelectronics, semiconductor, service, incubation, education	www.amcentre.com.au

Table 2- List of Micro and Nano Technology Facilities in Brisbane.

Name	Location	Area	Website
Alcan	Brisbane	Aluminium, production	www.alcan.com.au
Bio-Layer	Brisbane	Biominetic polymers	www.bio-layer.com
Claypave	Brisbane	Clay pavers, surface additives	www.claypave.com
Hydrexia	Brisbane	Hydrogen storage, magnesium alloys, fuel cells	www.hydrexia.com
Nanochem Holdings	Brisbane	wastewater treatment	www.nanochem.com.au
Nanocooling Technology	Brisbane	high temperature superconductor, microwave filter, ceramics	NA
Nanomics Bio Systems	Brisbane	DNA, microarray, bioassays, fluorescent dyes, ceramic beads	NA
NanoQuest	Brisbane	Materials, fuel cell	www.nanoquest.com.au
Orica Mining Service	Brisbane	Explosive systems, blasting systems	www.oricaminingservices.com
PANBIO	Brisbane	Diagnostic equipment, oligonucleotide chemistry	www.panbio.com.au
Poly Optics Australia	Brisbane	Fibre optic cable, polymer, LED	www.fiberopticlight.com
Very Small Particle Company	Brisbane	materials, metal oxides, manufacturing	www.vspc.com
XeroCoat	Brisbane	Coating, antifogging, anti-reflection	www.xerocoat.com.au

Table 3- List of Nanotech Companies in Brisbane



<< Coherent (representatives of a number of international micro and nano tools companies including Zyvex) and Australian Microelectronics Center are attracting the crowds at the exhibition area.

Dr Giulio Manzoni representing AIST Japan presenting Conception and Design of a Thermal Valveless Micropump at the BioMEMS and Nanotechnology Conference which was one of the best attended conferences at the SPIE symposium. >>

