

## **CALL FOR PAPERS**

### **Smart Coatings 2008**

27-28 February 2008

Orlando, Florida

The objective of this symposium is to provide a forum to present and discuss fundamental and applied science of smart coatings. Please provide a 100-150 word abstract by 18 August 2007

[Details](#)

## **FUNDING OPPORTUNITIES**

FP7 is the short name for the Seventh Framework Programme for Research and Technological Development.

This is the EU's main instrument for funding research in Europe and it will run from 2007-2013. FP7 is also designed to respond to Europe's employment needs, competitiveness and quality of life. [Details](#)

## **CONFERENCE DATES**

### **12th Asia Pacific Vibration Conference - APVC 2007**

6-9 August 2007

Hokkaido University, Sapporo, Japan

[Details](#)

### **UK Polymer Showcase 2007 Innovative Materials**

5-7 September 2007

London College of Fashion, UK

[Details](#)

### **How Smart is your packaging?**

12 September 2007

Perth, Scotland

[Details](#)

## **SMART.mat - A day at Edinburgh Academy**

With a strong reputation for producing top engineers (notably James Maxwell), Edinburgh Academy was pleased to host SMART.mat on 22<sup>nd</sup> June. Presenting some theory on smart materials and their selection, a flavour of some applications and running hands-on experiments, the SMART.mat team helped the students to lift the lid on this new scientific world. Making the session go with a bang, guest speaker Michael Ross of QinetiQ (Rosyth Shipyard) illustrated the importance and thought process of material selection. Once the students had seen a destroyer sunk with an underwater explosion and a test composite panel blown up, they were keen to learn more.



Once the youngsters were released from the lecture theatre, they got more detail on how the areas of biomimetics, physics, design / testing and chemistry are being used to bring smart materials and systems into the everyday world. Whether it was self-cleaning glass, imitating the complexity of a butterfly's wing or seeing shape memory alloys and their unusual behaviour, pupils enjoyed this snapshot of materials. Whilst the prospect of working with a large number of 14-17 year olds clearly terrified some of the SMART.mat technologists, this fear evaporated as debates started. With composites being made and tested to destruction, evaluating the pros and cons of piezo-electric devices, designing glass 'body-armour' and getting a flash from chemical reactions, students remained enthralled throughout the day.



Events like these are crucial to the long-term future of science and technology in the UK. Maintaining the enthusiasm of these young engineers can only result in a stronger economy long-term, and will be essential if the UK is to compete successfully against developing nations.

For further information please contact :

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## **STRUCTURES NEWS**

### **Magnetic Force**

Traditional vehicle suspensions are optimised for comfort or handling performance - but not both. This might be a thing of the past if a hi-tech magnetic damping system fitted to the latest Audi TT is anything to go by. Unlike the conventional shock absorber systems the TT's pistons do not contain oil, but a magneto-rheological fluid in which microscopic iron particles are suspended.

[Details](#)

### **First International conference on self-healing materials**

Scientific research into self-healing materials has taken off significantly worldwide in recent years. The Delft Centre for Materials of Delft University of Technology in the Netherlands took the initiative to mount the first conference on the topic. Over 180 leading scientists, including all the new discipline's renowned pioneers gathered in Noordwijk, the Netherlands, to present their findings. [Details](#)

## EUROMAT 2007

10-13 September 2007  
Nuremberg, Germany

[Details](#)

## Sensors & their Applications XIV

11-13 September 2007  
Liverpool John Moores

University,  
Liverpool, UK

[Details](#)

## National Aerospace Forum

12-13 September 2007  
Bristol Council House, UK

[Details](#)

## SPIE Europe Remote Sensing

17-20 September 2007  
Exhibition dates:

18-20 September 2007  
Florence, Italy

[Details](#)

## BIONIS 2007

20 September 2007  
Bath Royal Literary and  
Scientific Institution (BRLSI)  
Bath, UK

[Details](#)

## Electro-active Materials

20 September 2007  
Cranfield Management  
Development Centre,  
Cranfield, UK

[Details](#)

## OFMC 2007 Optical Fibre Measurement Conference

15-17 October 2007  
Teddington, UK

[Details](#)

## 10th International Trade Fair for Material Applications, Surface Technology and Product Engineering

16-18 October 2007  
New Munich Trade Fair Centre  
Germany

[Further Details available shortly](#)

## EuroSSC 2007, the 2nd European Conference on Smart Sensing and Context

23-25 October 2007  
Windermere, Lake District  
National Park, UK

[Details](#)

## 'Smarter' traffic monitoring

Traffic control boxes in Ohio State are to benefit from improved software that will enable road incidents to be identified and located by software that monitors traffic using car-sized wire loops buried in the pavement. Feedback from the sensors can then be used to manage the traffic.

[Details](#)

## Wireless monitoring of oesophagus reflux

A flexible RFID chip inserted into the oesophagus has been designed to wirelessly transmit data regarding the acidity of passing fluid to a receiver worn around the neck. [Details](#)

## Walking gait corrected by sensors to rehabilitate patients

A device worn in place of a traditional foot brace, senses whether the foot is on the ground or in the air and actively controls the calf muscles via electrical stimulation to correct the gait. [Details](#)

## 2cm long carbon nano-tubes have smart potential

The world's longest carbon nano-tubes have been grown. The fibres have the potential to be longer, stronger and better conductors of electricity than copper and many other materials could ultimately find use in smart fabrics, sensors and other applications. [Details](#)

## US physicists demonstrate power transmission without wires

Special resonant antennas have been used to show wireless power transmission from a transmitter to a 60W light bulb positioned 2 metres away. [Details](#)

## Wireless computerised sensors network that adapt function

Wireless sensor networks are being developed in which tiny computerised sensors organise themselves into networks that can adjust their shape and function according to information dictated by their environment. [Details](#)

## 3D micro-vascular network provides self healing system

A micro channelled self healing system has been developed that imitates a 3D micro-vascular sacrificial scaffolding network built up of layered polymer inks. When resin is poured around the structure and subsequently cured, the ink melts away leaving a hollow network of small channels that can be filled with an adhesive. [Details](#)

## Millimetre sized tactile sensor has been developed

A small sensor has been developed with tactile capabilities similar to a human finger, sensing position and magnitude of an applied force. [Details](#)

## Nanotechnology develops transparent circuits and transistors

Flexible colour screens and electronic paper could be possible with the development of transparent electrical circuits and transistors, along with "smart cards" and displays in windshields. [Details](#)

## A review of Microcantilevers and Nanocantilevers

A review of the technology and applications for Microcantilevers and Nanocantilevers using Microelectromechanical Systems (MEMS) technology has been produced. These have potentials for numerous chemical and physical sensing techniques. [Details](#)

## Remote operations of micro-machines is a possibility

The Casimir force - the weak attraction between close objects - can be altered using a beam of light which could have the potential for remote control of micro-machines. [Details](#)

## Bleeding control potential for nano-particles that self assemble on contact with salt

Nano-sized protein particles called peptides offer the potential for repair patches. As a result of the 'self-assembly' reaction to contact with salt, these particles could stop/reduce bleeding.

[Details](#)

## Smart materials could transform medicine

Intelligent biomaterials show promise in regenerative medicine, diagnostics and drug delivery, says UK scientist. Rein Ulijn, a biomedical materials specialist, claims that enzyme-responsive materials have the potential to detect, respond to, and ultimately repair biological processes'

[Details](#)





### Smart Coatings 2008

27-29 February 2008

Orlando, Florida

[Details](#)

### SPIE Smart Structures and Materials & Nondestructive Evaluation and Health Monitoring

9-13 March 2008,

Exhibition Dates:

11-12 March 2008

San Diego, California, USA

[Details](#)

### 3rd International Conference Smart Materials, structures and systems

8-13 June 2008

Acireale, Sicily, Italy

[Details](#)

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### IOM3 INSTITUTE

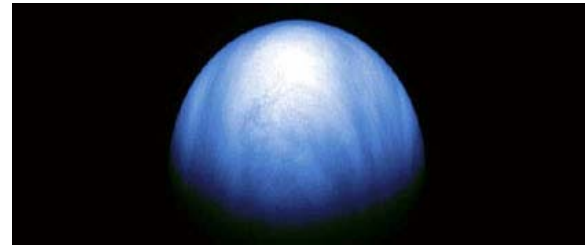
**MEMBERS** - you are able to update your contact details online and set up your personal interests profile by visiting the new 'members' area [HERE](#)

### Smart Nano Nose used to detect diseased cells

A molecular nose has been developed with nano-particle sized sensors that can detect proteins, which could potentially be used to detect protein types associated with diseased cells. [Details](#)

### Smart dust to be used to explore planets

"Smart dust" is being developed that is made up of small, shape shifting devices that can potentially be carried on the wind or fly in formation, communicate with one another and take scientific measurements. [Details](#)



### Giant magnetocaloric materials

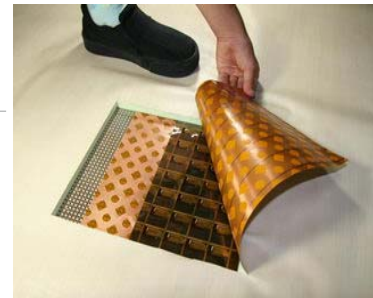
A magnetic field can be used to induce a temperature change in magnetocaloric materials, which could lead to new refrigeration techniques. This could help reduce the use of greenhouse gases. [Details](#)

### New fluorescent sensing material

A new fluorescent sensing material could be used to detect explosives by sensing vapours of TNT. [Details](#)

### Novel wireless power-transmission device

State of the art ink jet printing using electronic inks are being used to create thin, flat, flexible wireless power-transmission devices which can be located on desks, floors, walls etc. [Details](#)



### Smart car says when it needs a service

Smart cars are to be designed that can inform mechanics as to which part needs servicing, speeding up the servicing procedure. It is also envisaged that it could also determine which parts are still reusable when the vehicle comes to the end of its life. [Details](#)

### Smart nano-particles to carry cargo

Researchers have shown that nano-particles could be used to carry and deposit cargo at precise locations. Such cargo could carry nano-sensors, drugs, and genes to the cell interior. [Details](#)

### Conductive fibres used for smart fabrics

Polymer fibres coated with metal are being used as a flexible lightweight conductive material as an alternative to copper which can be heavy, expensive and breakable. [Details](#)

### Nano-particles used to detect mercury

A simple "litmus test" has been developed to detect mercury using gold nano-particles, DNA and clever chemistry, which could be used for environmental monitoring. [Details](#)

### Quieter windows

Noise vibration can be controlled using a chip of piezoelectric material bonded to a window which oscillates to counteract the vibration. [Details](#)

### Talking paper made by scientists

Digital paper that can speak to you has been created by scientists. Researchers have constructed an interactive paper billboard that emits recorded sound in response to a user's touch. [Details](#)

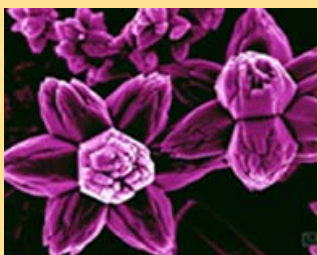


### Tobii launch a new generation eye tracking hardware and analysis software

Fundamental technology advances and new tools facilitate use of eye tracking and add substantial new values to usability and user experience studies. [Details](#)

### Intelligent car wheels for super cars

Scientists at the University of Portsmouth are using the latest breakthroughs in artificial intelligence to develop the world's first thinking car wheel. [Details](#)



## **SURFACES NEWS**

### **LG Philips develop first A4 sized colour e-paper**

A paper thin and bendable viewing panel, is designed to be energy efficient only using power when the image changes on the display. [Details](#)

### **Magnets change particle colour**

Researchers at the University of California have succeeded in controlling the colour of very small particles of iron oxide suspended in water simply by applying an external magnetic field to the solution. This could enable the manufacture of products such as colour electronic paper.

[Details](#)

### **M&S launches revolutionary iSuit**

This classic black pinstripe appears rather conservative - until the electronic wizardry hidden within is revealed. The M&S iPod suit has a 'smart-fabric' control pad for the MP3 player sewn into the left lapel. [Details](#)

### **New electronic fabric could deter shop lifters**

A new electronic fabric woven with conductive fibres could be designed to incorporate small electronic components, sensors as well as utilising wireless technology to provide a security for clothing, where an alarm would sound when taken outside of the premises. [Details](#)

### **Smart hat brings play to disabled**

A 'smart' cap that allows disabled children to 'drive' radio-controlled cars and boats has been launched. The Dream-Racer device has four motion sensors that detect small movements of the head, which are then fed wirelessly to control the toy's direction. [Details](#)

### **Smart Bandages**

Micro-gels are to be utilised within smart bandages to aid healing as they have a fast response to heat and pH. [Details](#)

### **Smart fit clothing**

Clothing that could alter its shape to fit snugly could be a reality due to the insertion of shape memory alloy wires that change length when a small current is passed through. [Details](#)

### **Smart surgical gloves**

Stretchable nano-scale silicon could pave the way for stretchable electronic devices that could be used for applications such as smart surgical gloves and health monitoring. [Details](#)

### **Self-cleaning surface of nano-fibres**

Nano-fibres have been grown at various heights on a surface, which are invisible to the naked eye, but can be tailor made to repel oil, dirt and water. [Details](#)

### **Health Check clothing**

Smart clothing is being developed that can monitor your heart and respiratory function wirelessly. Embedded electronics in the clothing can then be accessed when the clothes are put on the smart hanger which downloads data from the sensors. [Details](#)

European scientists are also developing clothing which will be able to monitor your health.

[Details](#)

New Zealand firm Zephyr Technology have also developed smart fabric which monitors the wearers vital signs and biochemical information. [Details](#)

SMART.mat is a DTI funded project and is part of the Materials Knowledge Transfer Network (KTN) concentrating on 'smart' technology. SMART.mat is a partnership of QinetiQ, NAMTEC and the Institute of Materials, Minerals and Mining.

[Click Here to visit the Materials KTN Website](#)

**The next issue of the SMART.mat newsletter will be distributed in October 2007.**

