

**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**

2nd International Congress Competitiveness and technological innovation in the textile sector
5 and 6 November
Aitex, Alcoy, Spain
[Details](#)

SMART Materials for SMART Buildings
14 November 2008
The Innovation Park,
BRE, Watford
[Details](#)

TEP presents New Technologies and Smart Material
6 December 2008
Radisson Hotel, Glasgow
[Details](#)

SPIE Smart Materials, Nano- and Micro-Smart Systems 2008
9-12 December 2008
Melborne, Australia
[Details](#)



Another Side of Fashion 2 - Fashion and Smart Materials

Held on the 18th and 19th September this was the second in a series of networking events, entitled Another Side of Fashion, to explore the wider influence of fashion, and the potential synergies between fashion, materials science and digital technology. It was hosted by the National Physical Laboratory (NPL), the University of the Arts (UAL), the Creative Industries Technology Innovation Network (CITIN), SMART.mat and The Materials and Design Exchange (MADE) of the Materials KTN, and the Smart Materials and Systems Committee (SMASC) of the Institute of Materials, Minerals and Mining (IOM3). The overall aim of these networking events is to raise the profile and awareness of the value that fashion and design can bring to the development and commercialisation of new products and materials amongst the science and technology communities (HEIs and industry). The event formed part of the London Design Festival and London Fashion Week. The event was comprised of three parts:



Part 1: Products and Materials Bazaar

The Bazaar comprised smart materials, demonstrators, posters, videos, as well as fashion storyboards (visualisations of smart materials applied to fashion). Visitors were able to leave comments and ideas inspired by the bazaar on the 'feedback dress'. Visitors left suggestions such as a 'temporary tattoo fabric', and a 'lenticular fabric'.

Part 2: Evening outreach to the public – Clever Dressing

The public debate was hosted as part of the Dana Centre's programme of innovative debates about contemporary science, technology and culture.

Part 3: Day workshop for specialists

[Details](#)

A Smart event to improve the air travel experience

Air travel is now a routine experience for much of the UK, whether it be for business or pleasure. Expectations from passengers have risen and the level of complaints received by the Air Transport Users' Council (AUC), the consumer body for air passengers, is rising steadily. The House of Commons Transport Committee report on "Passengers' Experiences of Air Travel" concluded that there was a role to play for new technology to overcome problems encountered. Working with Airport Operators and Airline Design Teams, the potential for smart materials and systems was explored. Rather than relying solely on publication of a static document, a workshop was held at IOM3 in London in July to engage with invited stakeholders and develop roadmaps for various themes within air travel as it impacts on customers. [Details](#)

Electronic nose for explosive detection

A team of American scientists believe they have the technology and know-how to create a hand-held electronic nose capable of sniffing out even tiniest traces of explosives, which could one day see the sniffer dog out of work. [Details](#)

Stopping identity fraud with quantum tunnelling composites

The risk of fraudsters or terrorists hacking into our personal data will reduce if novel ultrathin switches are incorporated into biometric passports and contactless credit cards, says the team at Peratech in Richmond, UK. The technology, made from quantum tunnelling composites (QTCs), would allow the owner to restrict when sensitive information contained in radio frequency identification (RFID) microchips is read by pressing the control as and when needed. [Details](#)

UK Young Scientists and Engineers Fair 2009

04 Mar 2009 - 06 Mar 2009,
Queen Elizabeth II Conference
Centre, London, UK

[Details](#)

Materials KTN Annual Event

23 Apr 2009
Church House Conference
Centre,
London, UK

[Details](#)



Scientists develop high tech 'green' explosives

An eco-friendly explosive might sound like a contradiction in terms but scientists at the US Lawrence Livermore National Laboratory are claiming to have made just that. By using new ionic liquids instead of traditional compounds, the scientists have created explosive compounds that are purer, less polluting and less likely to go off accidentally when subjected to heat or impacts. [Details](#)

Energy Harvesting for Wireless and remote sensor

Action Group Study

The Sensors & Instrumentation Knowledge Transfer Network (KTN) has considerable interest and activity in the area of wireless sensing and wireless sensor networks. The powering of remote and wireless sensors is widely cited as a critical barrier limiting the uptake of this technology. Energy harvesting is a means of powering wireless electronic devices by scavenging many low grade ambient energy sources such as environmental vibrations, human power, thermal and solar and their conversion into useable electrical energy. Energy harvesting devices are therefore potentially attractive as replacements for primary batteries in low power wireless sensor nodes. [Details](#)

Speed - Vest

The SPEED-VEST is a bicycle safety device and advocacy tool which displays the wearer's current speed on their back in bright numbers. It improves rider visibility while legitimizing bicycle speeds on the roadway. The system consists of a wheel speed sensor, a wearable numeric display and a small computer that does the thinking. The computer is an Arduino: an open-source embedded computing platform powered by an Amtel microcontroller. It runs for 6 hours on a 9 volt battery

[Details](#)

Home on the range

Architects building a retreat on the outskirts of Ahmedabad drew inspiration from a neem tree to build something elevated and cool without using air-conditioning. The house has been designed to stay cool throughout the year. In the summer, the sloping walls and ferrocement roof keep the sunlight out for the better part of the day. The east and west walls have shorter spans to reduce solar exposure. [Details](#)

Growing smart materials idea comes from trees

A key consideration when developing complex new 'smart' materials is - what is the best way to move substances from one place to another?

Duke University researchers believe the answer to this question is in the canopy of trees. The image of two tree canopies touching top-to-top can guide efforts to efficiently control the flow of liquids in new materials, including next-generation aircraft and rocket "skins" that can self-repair when damaged or self-cool when overheated. [Details](#)

Neural network-based micropositioning control of smart shape memory alloy actuators

Shape memory alloys (SMA) are a special kind of smart materials whose dimensions change because of a temperature-dependent structural phase transition. This property can be used to generate motion or force in electromechanical devices and micromachines. However, their highly nonlinear hysteretical stimulus-response characteristic fundamentally limits the accuracy of SMA actuators. [Details](#)

Smart intersection

Ford Motor Company researchers have developed a 'smart intersection' that uses GPS technology and wireless communications to reduce traffic accidents and ease congestion. The intersection is fitted with technology that can monitor potential hazards, and then transmit that information to vehicles. Several pieces of data are sent to the vehicle, including a digital map of the intersection, six additional maps of surrounding stop sign intersections and crosswalks, lane-specific GPS location, as well as traffic light status and timing information. [Details](#)

Smart lenses

'Smart' contact lenses that measure pressure within the eye and dispense medication accordingly could be made possible thanks to biomedical engineers at UC Davis. To develop the smart lenses, Tingrui Pan, assistant professor of biomedical engineering, and post-doctoral researcher, Hailin Cong, started with a material called polydimethylsiloxane (PDMS). [Details](#)

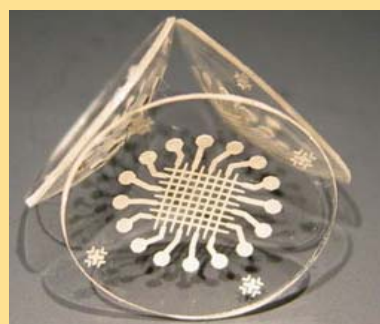
Smart communication

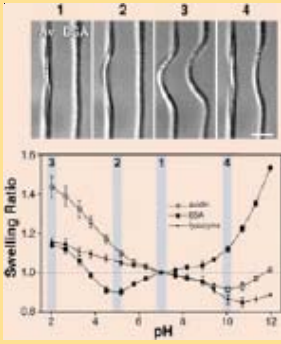
As part of its overall fight to curb road accidents and traffic jams, the European Commission has decided to reserve, across Europe, part of the radio spectrum for smart vehicle communications systems. The new communications systems allow cars to wirelessly communicate to other cars and to the road infrastructure itself. [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](#)





Hydrogels bend on command

Researchers at the University of Texas at Austin have used multiphoton nonlinear excitation to fabricate chemically responsive protein structures embedded in a protein hydrogel matrix [Details](#)

Hot pizza guaranteed

Good news for takeaway pizza lovers. As of March 2008, each Pizza Hut pizza box will display a heat sensitive sticker ("Hot Spot") which reacts to changes in temperature. Once a hot pizza is placed in the pizza box, the Hot Spot will become transparent to reveal the word HOT. [Details](#)

Materials may help autos turn heat into electricity

Researchers have invented a new material that will make cars even more efficient, by converting heat wasted through engine exhaust into electricity. The material is described as being twice as efficient as anything currently on the market. Scientists call such materials thermoelectric materials, and they rate the materials' efficiency based on how much heat they can convert into electricity at a given temperature. [Details](#)

Molecules with muscles

Earlier this year researchers headed by Professor Chris Easton achieved a world first by creating a cyclodextrin-based molecular muscle that can expand and contract when exposed to different wavelengths of light.

Cyclodextrins are complex toroidal molecules that can be created by the appropriate actions of enzymes on starch. One of their key features is that the exterior of the ring is hydrophilic, meaning they are highly soluble in water. The hollow interior is much less hydrophilic than the exterior, making cyclodextrins a good host for other smaller hydrophobic molecules that like to sit inside them. [Details](#)

Domestic gadgets go hi-tech

Can the route to domestic bliss be smoothed with a few home-help gadgets?

Domestic appliances just got sexier!! Have a look at these time and energy saving appliances that include a washing machine that does the ironing to a droid that cleans the floors. [Details](#)

Smart plankton to 'see' underwater

Gadgets that copy plankton's drifter lifestyle could improve our understanding of the world's oceans. Italian researchers are working on "smart plankton", which will carry sensors and communicate using flashing lights. Released in groups, they could drift through the ocean collecting data. This is a watery take on an idea dubbed "smart dust", already used to monitor environmental conditions on land and tipped to transform extra-planetary exploration. The smart dust model uses many small, cheap sensors that communicate wirelessly to track environmental conditions over wide areas. [Details](#)

Solar-powered wi-fi comes to Brazil

These days' net users in developed nations can get online pretty much anywhere thanks to reliable electricity and telecoms networks, but in developing nations where power sockets and fixed line links can be few and far between the same is not true. A project at the University of Sao Paulo aims to overcome one of these hurdles by using the sun to power a self-contained wi-fi access point. [Details](#)

Smart shoe keeps you on your toes

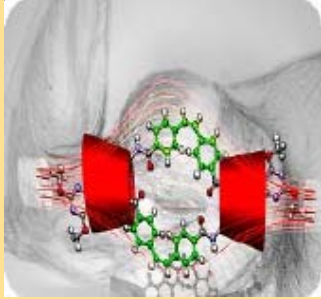
Falls are the leading cause of accidental death in people over 65. Now technology developed for astronauts could help to monitor those at greatest risk. When astronauts return home after months in zero gravity, they have their balance tested. A sensor tracks their changing centre of mass as the floor and walls of the box they are standing in slide and tilt. A version of the software used in this system has now been developed to fit inside a shoe. [Details](#)

Smart specs for the blind

Electronic canes for the blind are designed to detect nearby objects and provide a stereo audio signal that informs a person of the location of obstacles. But they do not distinguish between stationary and moving objects. However, a pair of spectacles fitted with a camera and accelerometers that detect movement can. They are connected to a computer that spots any obstacles in the field of view and works out which are moving. [Details](#)

PICNIC Green Challenge 2008

The winner of this years PICNIC Green Challenge, the international creative competition of the Dutch Postcode Lottery and cross-media event PICNIC was Greensulate. Greensulate is a revolutionary low-cost, rigid insulating composite that biodegrades at the end of its useful life cycle. So while its polystyrene counterparts take up landfill space indefinitely, Greensulate doesn't overstay its welcome. [Details](#) [Details](#)





Smart inhaler

An increasingly common way of treating cancers, AIDs and diabetes, not to mention asthma, is by inhaling a drug in aerosol form. But inhalers are notoriously inefficient. At best they deliver 20% of their load into the lungs. At worst, they deliver less than 5%. The rest gets left in the mouth and throat, or gets blown back out into the air, particularly if the user's intake of breath is not well synchronised with the aerosol jet. With some drugs costing more than their weight in gold, that is an expensive waste. [Details](#)

'Smart ears' for machines

A major project is under way to give machines 'smart ears'. The aim is to develop digital systems that can understand the sounds they hear so they can react appropriately.

A traffic camera, for example, would know where to zoom when it heard a crash. At a football match a search engine would find a video clip of a goal by listening for the crowd's roar. A computer would print out a symphony score after enjoying the live performance. [Details](#)



NPL's SMART range

The development of smaller, smarter and even wearable antennas has received a boost thanks to the completion of a new facility at the National Physical Laboratory (NPL). Wireless communication through mobile phones, GPS, WiFi and WLAN is becoming increasingly in demand, while devices such as laptops commonly use Bluetooth and ultra wideband (UWB) over short distances. However, with this has come demand for smaller devices with lower power consumption, allowing the entire unit to be made smaller and lighter [Details](#)

Battling Corrosion

The current issue of Materials Today focuses on how thin films, coatings, and nanovessels can provide corrosion protection and even heal materials. Corrosion-resistant metallic coatings reports on U.S. researchers investigating the possibility of a tunable amorphous alloy that acts as a local corrosion barrier, and can also supply soluble ions which act as corrosion inhibitors. [Details](#)

Fabrication and actuation of electro-active polymer actuator based on PSMI-incorporated PVDF

In this study, an ionic networking membrane (INM) of poly(styrene-alt-maleimide) (PSMI)-incorporated poly(vinylidene fluoride) (PVDF) was applied to fabricate electro-active polymer. Based on the same original membrane of PSMI-incorporated PVDF, various samples of INM actuator were prepared for different reduction times with the electroless-plating technique. [Details](#)

Materials

Knowledge Transfer Network

Feed back on SOA

SMART.mat is keen to receive feedback on the State of the Art Reviews that can be found on the [website](#). Please send your comments to Jackie.Butterfield@iom3.org

Download the following reports from the SMART.mat website

- NEW Smart Surfaces and Functional Coatings in the Modern Built Environment
- NEW In-Vivo applications of SMART Materials
- Smart and Active Packaging to Reduce Food Waste
- Consumer Packaging - Opportunities for SMART Technologies
- State of the Art Review - Structural Health Monitoring
- SMART Materials, a designer's handbook

News on company products

If you or your company would like to include news on any products / programmes that are applicable to smart structures or surfaces in the SMART.mat quarterly newsletter, please provide a brief description, contact details, and website address to nicola.radford@namtec.co.uk

SMART.mat is a TSB funded project and is part of the Materials Knowledge Transfer Network (KTN) concentrating on 'smart' technology. SMART.mat is a partnership of 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 January 2009.

