

## **MATERIALS AND DESIGN EXCHANGE E-NEWSLETTER 6, May 2007**

News and events for the materials science and design communities

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The Materials and Design Exchange – MADE – brings together the communities of design and materials technology in order to stimulate innovation, promote the transfer of materials knowledge and improve the competitiveness of UK business.

MADE is part of the Materials Knowledge Transfer Network (KTN) funded by the Department of Trade and Industry, forging a link between designers and other sectors of the KTN concerned with metals, plastics, textiles and the full range of modern materials.

The core partners of MADE are the Institute of Materials, Minerals and Mining (IOM3), the Royal College of Art (RCA), the Design Council, the Institution of Engineering Designers (IED) and the Engineering Employers Federation (EEF South).

Visit the MADE pages at [www.materialsktn.net](http://www.materialsktn.net).

### **MADE, MATERIALS KTN AND IOM3 EVENTS**

6 June 07

#### **Seeds of destruction**

Biodegradable mobile phones are one thing, but a biodegradable phone that releases the seed of a sunflower? You might see this innovation as a piece of fairy-tale magic or simply a hippy gimmick – delegates took both views at an IOM meeting in February, which is to be run again due to popular demand on 6 June. Its developers at the Warwick Manufacturing Group regard it as a device for raising awareness. The phone itself is made of polyvinyl alcohol-based composite. One day there'll be no excuse for not being 'aware', and we'll have to start actually solving problems. This meeting promises to make a start. 'Working with Nature – Green Design Polymers' is at the IOM3, London, SW1. Contact: [eileen.ellis@iom3.org](mailto:eileen.ellis@iom3.org)

6 July 07

#### **I want to ride my bicycle**

For the first time ever, the Tour de France starts off in London. To mark this unique event, the IOM3 has organized a one-day conference, 'Materials in Bicycles'. Despite its humble image, the bicycle remains one of the most efficient means of transport ever invented, and is the intensive focus for materials scientists and designers alike. British Olympic Gold medallist Chris Boardman will give the rider's view of a technology that is once again a focus for innovation. For evidence of this, look at the return, after a long historical break, of car manufacturers such as Audi and Porsche to pedal-powered two-wheeled transport (only Peugeot has continuously pursued both). As for materials, how about a bike using renewable resources. Watch for the return of the bamboo frame, first seen in 1895. 9.00 am–5.00 pm, then to Trafalgar Square for the Tour de France starting ceremony. IOM3, London, SW1. Contact: [paul.harris@iom3.org](mailto:paul.harris@iom3.org)

25 Sept 07

### **Manufacture without factories, design without constraints**

Just as his model of the manufacturing economy loses its currency, the Scottish philosopher Adam Smith pops up on the new £20 note. Smith marvelled at how making a pin was divided into 18 separate jobs. But now we're beginning a big rethink. Wouldn't it be better to make things additively in a single pass – as nature does. This is the promise of the fast advancing technology of Rapid Manufacturing, which has been chosen as the theme of this September's MADE conference. Hosted and organised by InnovationRCA at the Royal College of Art, the conference will focus on future opportunities for design/materials innovation, and is central to MADE's contribution to the London Design Festival 2007. The stage was set in April with a MADE seminar at the Materials KTN Annual Meeting where Richard Hague, head of the Rapid Manufacturing Research Group at Loughborough University, and Martin Watmough of RapidformRCA, academia's largest digital manufacturing bureau at the RCA, explained how the traditional relation between maker, object and user will be upset in a revolution that will put materials centre-stage and transform the role of the designer. Metal parts made by rapid manufacturing techniques can have superior physical properties to cast or machined parts, while in three-dimensional design terms 'complexity comes for free.' MADE design mentor Geoff Hollington calls it 'the hinge point for a second industrial revolution.' Tell your kids you were there! For information about the conference, to be held on 25 September, please contact [innovation@rca.ac.uk](mailto:innovation@rca.ac.uk) (If you can't wait that long, see news of the rapid manufacturing conference in July at Loughborough, below.)

### **OTHER NEWS**

13 May 07

#### **Kryptonite discovered on Earth**

I may have given the impression in the last newsletter that the Superman-slaying compound kryptonite is unknown on Earth. Not so, it seems. Chris Stanley, a mineralogist at London's Natural History Museum has found a mineral containing all the requisite elements – sodium, lithium and boron with silicate and hydroxide. Well, all except fluorine, actually. Still, who wants to stand in the way of a good story? The stuff is on special display on Sunday 13 May at the museum. But be warned. It isn't a green crystal and doesn't glow. [www.nhm.ac.uk/about-us/news/2007/april/news\\_11392.html](http://www.nhm.ac.uk/about-us/news/2007/april/news_11392.html)

16–17 May 07

#### **Nano good, macro bad**

For luddites, nanomaterials are the next big environmental hazard. But, whisper it, could they actually do more good than harm in the environment? Chemicals by any other name, nanomaterials can have good or bad effects depending on where they are used. Thus, they may help us reduce our bulk use of chemical nasties, provide means to clean up waste and save energy, as well as reducing the use of limited resources in the first place. Find out how at the 'Nanotechnology: Products and Processes for Environmental Benefit' conference to be held on 16 and 17 May at the Royal Society in London, SW1. Speakers range from the chief scientific adviser to Defra to the London College of Fashion. [www.nano.org.uk/newsletter/environment/index.htm](http://www.nano.org.uk/newsletter/environment/index.htm)

22 May 07

### **The guilty pleasure of plastics**

Ninety per cent of the plastic we use finds its way into landfills, even though much of it is produced from non-renewable resources and is recyclable in principle. Most of the rest seems to end up in museum collections, to judge from a major exhibition at the Science Museum (London, SW7) which includes Ekco radios and Art Deco mantle clocks among over 300 treasured objects made of bakelite alone. 'Evolving Plastics' is clear that we cannot go on as we have been doing, but are plastics part of the problem or can they be a solution? [www.sciencemuseum.org.uk](http://www.sciencemuseum.org.uk)

23–25 May 07

### **Another one bites the dust**

Bakelite's pretty robust stuff, of course, and many objects made using it well worth the effort to save. But the more recent plastics get, the more of a conservation problem they present. Where will we draw the line? One presentation at 'Plastics: Looking at the Future and Learning from the Past' considers the fate of Freddie Mercury's fake leather trousers, for example. Artist Pamela Wells is determined to make the job of future conservators even more difficult, by working with especially fragile plastics, while the current trend to use biodegradable plastics for all sorts of products makes the collector's task all but futile. The conference is at the Victoria and Albert Museum, London, SW7, from 23 to 25 May.

[www.vam.ac.uk/whatson/tickets/product.php?xProd=290](http://www.vam.ac.uk/whatson/tickets/product.php?xProd=290)

26–27 May 2007

### **What can the matter be**

Forget the hushed tones of the art gallery. The team from King's College London's Materials Library has toured Tate Modern recording sounds associated with various artworks related to the materials of their execution. The results are available on a podcast. Interaction with the materials of an artwork can change appreciation of both artwork and the material, says Zoe Laughlin of the Materials Library. The team is also taking part in the Tate Modern Long Weekend of public events on 26–27 May.

[www.tate.org.uk/modern/tours/materialslibrary/](http://www.tate.org.uk/modern/tours/materialslibrary/); [www.materialslibrary.org.uk/](http://www.materialslibrary.org.uk/)

15–24 June 07

### **Footprints in the Strand**

A footprint can mean the size and shape of the space a building inhabits, or the carbon footprint of a building or area, or it can mean what is left behind; a legacy, regeneration or void. RIBA London will be working with partners across the city to create footprints exploring ideas of change, regeneration, sustainability and legacy. The event is one of many taking place as part of Architecture Week nationwide. This year's theme, 'How Green is our Space?', focuses on climate change and sustainability. Events range from the intensely practical to the inspirational, including an inside look at London architect Sarah Wigglesworth's exemplar house/office, and an exhibition in Lewes on how the 'natural supply chain of materials' links landscape and architecture. For full details go to [www.architectureweek.org.uk](http://www.architectureweek.org.uk)

4–6 July 07

### **John Ruskin in the 25th Century**

What is craft? Who is it for? Is it basically a romantic business, all about preserving traditional practices, essentially nostalgic and backward-looking? Or, is it a bellwether of the future, with ways of making seen in craft today suggesting new paradigms for manufacturing and promising to democratize the processes of design and making. What materials are craft materials? Ancient or modern? Natural or artificial? Does craft demand talent? Does it demand creativity? Doubtless speakers at the 'New Craft - Future Voices' conference and exhibition have answers for these and other questions. The event focuses on the experience of creating craft in the 21st century, embracing everything from digital technology to hobbyist interests, and will be at Duncan of Jordanstone College of Art & Design, University of Dundee, from 4 to 6 July.

[www.newcraftfuturevoices.com](http://www.newcraftfuturevoices.com)

11–12 July 07

### **Swift progress in rapid manufacturing**

So rapid is progress in rapid manufacturing – the tying together of CAD with fabrication techniques formerly used mainly for prototyping to make unique and economical finished products – that it's hard to believe that this year sees only the second international conference on the subject. The meeting brings together industry and academia, with speakers from British and American universities and companies such as Boeing, Siemens and BAe Systems. The emphasis at the moment is on items where a custom fit is important. Richard Bibb of the University of Wales Institute Cardiff will describe selective laser melting to make dental implants, for example. But it is easy to see how this extends into products with more general appeal. Conference organizer Richard Hague will talk about the development of personally tailored, high-performance sports equipment. The conference is on 11–12 July at Loughborough University. For details, see [www.rm-conference.com/](http://www.rm-conference.com/)

14–17 Sept 07

### **Crafty beggars, dodgers and weavers**

'Crafty' is hardly a neutral adjective, as Janis Jefferies of Goldsmiths College notes. It carries with it double meanings of wilful, mischievous, and secretive. Are well crafted objects devious and deceitful? Are they true to their materials or does part of the pleasure they give lie with the unexpected sensory feedback they provide, confusing vision, hearing and touch? How does the encroachment of computers into craft activity promise to change this? Artists, museologists and technologists involved in textile making will discuss these matters in a one-day seminar at the Constance Howard Resource and Research Centre in Textiles. Contact the centre for further details: [connitex@gold.ac.uk](mailto:connitex@gold.ac.uk); <http://www.goldsmiths.ac.uk/constance-howard>; The seminar is part of the European Textile Network conference: [www.etn-net.org](http://www.etn-net.org)

### **Material extensions of our selves**

In what ways will we become extended, dispersed, improved, displaced, or empowered by new arrangements of materials engineering around and within our bodies? Andy Robinson and Tobie Kerridge of Goldsmiths College aim to find out through workshops exploring the impact of technologies which enable our bodies to interact with materials in new ways. The first 'Material Beliefs' workshop, held in April, brought together materials scientists, interaction designers, artists such as Jane

Prophet, and engineers such as Brendan Walker who trained at an aeronautical engineer and worked for British Aerospace before taking time out ‘to understand his romance with moving structures and their potential to thrill him.’ Robinson and Kerridge hope to use design likewise as a way to engage with engineering research. [www.materialbeliefs.com/blog/](http://www.materialbeliefs.com/blog/)

### **Innovation poll picks bricks and concrete**

Ask a hundred ‘key thinkers’ what the greatest innovation in their field is and you get, well, almost a hundred different answers. Spiked did just this, asking scientists, writers, philosophers and others. Many chose ideas or processes, but some humble materials made the final cut: the brick, concrete (the second most used resource after water, apparently), phosphorus and windows (not Windows!) Other nominations were received for the shift from metals to plastics in the healthcare industry, as well as for rapid prototyping and being able to make ‘DNA origami’ – million-atom 3D structures. Read what fractal discoverer Benoît Mandelbrot has to say about roughness’, and Nobel physics laureate John Hall on why it’s important to know the time (to 15 digits). [www.spiked-online.com/index.php?/innovationsurvey/](http://www.spiked-online.com/index.php?/innovationsurvey/)

### **It’s slime to go!**

Snail slime must be pretty special stuff, you might think, providing both lubrication and adhesion. Not really, according to researchers at the Massachusetts Institute of Technology and the Catholic University of Leuven who compared natural snail slime with a range of clay-polymer substitutes used to enable a small robot to climb walls. Lots of things will do, from hair gel and axle grease to mayonnaise and peanut butter (smooth, not crunchy, presumably). It’s all in the action, apparently: the snail pushes until the structure of the glue breaks, at which point it glides forward. When the snail stops, the glue structure reforms, sticking the snail safely to the wall. [www.rsc.org/Publishing/Journals/SM/article.asp?doi=b615546d](http://www.rsc.org/Publishing/Journals/SM/article.asp?doi=b615546d). This information might come in handy if you’re planning to enter the next World Snail Racing Championships in July in Norfolk. [www.snailracing.net](http://www.snailracing.net)

### **(A bit) like water off a duck’s back**

The most familiar application of biomimetics –the lotus-leaf effect used to repel water from treated surfaces – continues as a focus of research interest. Boris Striffler of the University of Bonn, having tried aeroplane coating for greater fuel efficiency (unfortunately the coating could not be walked on by maintenance crews), is now looking at ways of reducing flow resistance on ships. [www.lotus-effect.com](http://www.lotus-effect.com). Meanwhile, researchers at Queen’s University Belfast have found a way to replicate the lotus leaf effect on metals directly by immersing them in a metal-salt solution which deposits a textured metal layer with strongly hydrophobic properties. [www.innovations-report.com/html/reports/materials\\_science/report-79431.html](http://www.innovations-report.com/html/reports/materials_science/report-79431.html)

### **The shoemaker’s son always goes barefoot ...**

... according to the proverb. Perhaps with good reason. Walk a thousand miles in shoes, and your shoes get holes; walk a thousand miles in bare feet and your feet get tougher. Which is the better technology? Latching on to this truism, the first international conference on self-healing materials took place in April in the Netherlands, organized by the Delft Centre for Materials of Delft University of Technology to draw together many strands of new research. The first applications are likely to come in self-healing concretes and asphalts, organizers predict. A book of

the conference due in mid year should provide an invaluable overview of this fast-developing field. [www.selfhealingmaterials.nl](http://www.selfhealingmaterials.nl)