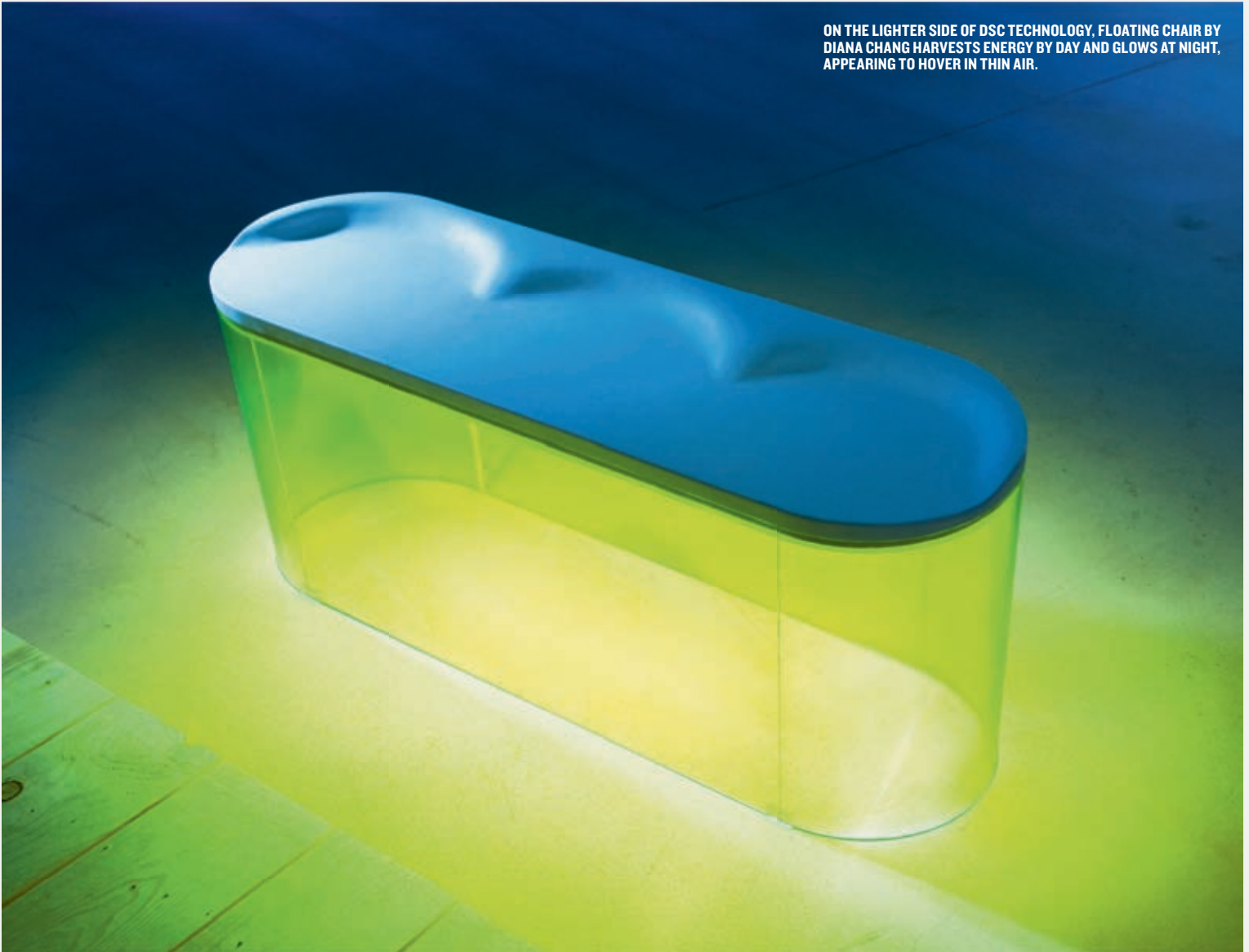


ON THE LIGHTER SIDE OF DSC TECHNOLOGY, FLOATING CHAIR BY DIANA CHANG HARVESTS ENERGY BY DAY AND GLOWS AT NIGHT, APPEARING TO HOVER IN THIN AIR.



# SOLAR SYSTEMS

**Focusing on products with integrated solar cells, students from four design schools showed their work at the ICFF.**

WORDS SHONQUIS MORENO  
PHOTOS TONATIUH AMBROSETTI AND DANIELA DROZ

Remember those chunky photovoltaic panels that resembled badly designed credit cards but were much, much thicker? Well, forget them. Sunny Memories is a travelling exhibition of student-made products that use dye-sensitive solar cells (DSCs) to make anything from radios and planters to insect repellent. If it is any indication, PV tiles will go the way of the Betamax VCR, unfettering us from the electrical grid and battery recycling, making our lives more portable – and disappearing into good-looking objects instead of dominating them.

The show, which made its first US stop at the Center for Architecture in New York in May, was initiated by the three-year-old ECAL Lab, which is part of the École Polytechnique Fédérale de Lausanne (EPFL), a prestigious Swiss institute of higher education. The Lab, which explores the

application of new technologies by giving them to designers to get fresh ideas, invited industrial-design students from the California College of the Arts (CCA), London's Royal College of Art (RCA) and the Paris-based École Nationale Supérieure de Création Industrielle (ENSCI) to join ECAL in creating products using the DSC technology invented by EPFL's Michael Grätzel.

The dye cell has existed since the 1960s but with only 5 per cent efficiency. (The maximum efficiency possible in a solar cell is only 32 per cent.) But, in 1991, taking photosynthesis as his muse, professor and photochemist Michael Grätzel used titanium nanoparticles to make the dye more absorbent and his cells 12 per cent efficient (a percentage that continues to grow), earning him the coveted Millennium Technology Prize in June. The film-like 'Grätzel cell' is slender,

flexible, strong and cheap to make. It can be transparent or printed with colour and pattern. It generates energy at low light levels or under artificial light to power anything from mobile phones to appliances integrated into buildings. 'Using inks and dyes to collect solar energy means that any window or, later, any painted surface will be able to collect energy and be self-sufficient. This would change everything,' says designer Yves Béhar, one of the CCA instructors.

'This technology has a lightness of being and of implementation that is unique and which generates light objects,' observes French designer and ENSCI professor Jean-Francois Dingjian of Normal Studio. Dingjian's university workshop is called Meaning in Utility and was developed around real-world partnerships with manufacturers and industrial and technology >>>



**GULLIAN GRAVES MADE A SELF-POWERED MONO AMPLIFIER – APTLY ENTITLED HORN – THAT IS REMINISCENT OF AN OLD-FASHIONED GRAMOPHONE SPEAKER.**



**FRAGRANT MEMORIES BY ROMAN PIN LOOKS LIKE A HANGING LAMP BUT IS, IN FACT, AN AIR FRESHENER EQUIPPED TO HOLD VARIOUS TYPES OF LIQUID.**

**THE RAINBOW OF COLOURED CELLS FEATURED IN HELIO, LÉA LONGIS'S DAB DIGITAL RADIO CONCEPT, CAPTURES SUNLIGHT AND TRANSFORMS IT INTO ENERGY.**





COLLECTING SUNLIGHT BY DAY, FARO BY DIRK WINKEL TURNS SOLAR CELLS INTO ORNAMENTAL GLASS TILES AT NIGHT.

## 'We need an undogmatic approach to get away from the black panels on the roof'

Michael Grätzel

companies. For him, the dye-sensitive cell is liberating because it can be applied so easily – printed just as newspapers are printed – and used to fill the roles of batteries and circuits. 'This technology interrogates the notion of automatism,' Dingjian points out. 'In the 1960s, we had a concept of automatism that was linked to mechanism. In the 1980s, it was domotics – the remote-controlled house – but today it is about the passive and intelligent autonomy of objects that no longer need to be told what to do.'

Sunny Memories boasts an excellent exhibition design (by Big Game) and an attractive catalogue (by Emmanuel Crivelli), but the wall text smacks of marketing instead of curatorial commentary and fails to explain how each product demonstrates the technology's potential – which is precisely what each product does.



RCA student Jamie Tunnard made the Solar Tile, an energy-gathering flagstone, which floored Professor Grätzel. 'You can imagine whole streets that produce solar power, but I had never thought about it,' he admits. 'Why not? A scientific approach sometimes makes you dogmatic about what you should and shouldn't do, so you don't think of beautiful applications like these. We need that undogmatic approach, because to get away from the black panels on the roof, we have to surprise people.'

The surprising, because knobless and featureless, Heliotone radio by Emile Rosen of the RCA turns a single cell into a radio, serving as speaker, touchscreen and power source simultaneously. The thick glass base of the Floating Chair by the CCA's Diana Chang is also one (huge) cell with no seams and no

opacity – just a sheer chartreuse tint. After harvesting energy by day, it emits a diffuse glow at night, making the seat appear to float in the air. ENSCI's Christophe Machet and Enrique Illánéz made the N47 bowl to store and charge hand-held portable devices. Contrary to standard practice, the cells were integrated into the surfaces vertically, not laid on top of them. Daniel Castro, who studied at both the CCA and ECAL during the project, made Solcool, a portable cooler for preserving medicine and organs in disaster areas and developing countries. It absorbs light via cells on its exterior, while also absorbing the heat from its conductive carbon-fibre shell to store additional energy in its capacitor. Before he settled on this eminently useful concept, Castro considered projects such as a taser combined with an umbrella, a mailbox-



JAMIE TUNNARD'S INVENTION, SOLAR TILE, GATHERS ENERGY IN ITS DSCS, WHICH ARE EFFECTIVELY A SANDWICH OF CERAMIC POWDER, GLASS PLATES AND AN ELECTROLYTE.

cum-paper shredder and a 'living' thermostat. 'In retrospect,' he recalls, 'I suppose I needed to sift through the silly to realize the serious.'

Looking forward with humour and sincerity, we see a future in which design must begin to embed technologies into objects with true transparency. 'The question then is: what form shall we give to things that are invisible?' says Dingjian. 'What meaning do forms bear when it comes to qualities or functions that are basically imperceptible? Technology is dematerializing, but objects need to be rematerialized.' ■■■■

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YOU'VE GOT MAIL BY CLARE HSU TRANSFORMS SUNLIGHT INTO INFORMATION: THE POSTBOX SENDS A TEXT MESSAGE WHEN THE POSTMAN DROPS A LETTER INSIDE.

SOLCOOL BY DANIEL CASTRO COULD SAVE LIVES IN DISASTER AREAS BY CONVERTING LIGHT AND HEAT INTO THE ENERGY THAT POWERS THIS REFRIGERATED UNIT, WHICH HE DESIGNED TO PRESERVE HUMAN ORGANS AND MEDICINE.

