Ubiquitous Energy sets focus on solar cell technology

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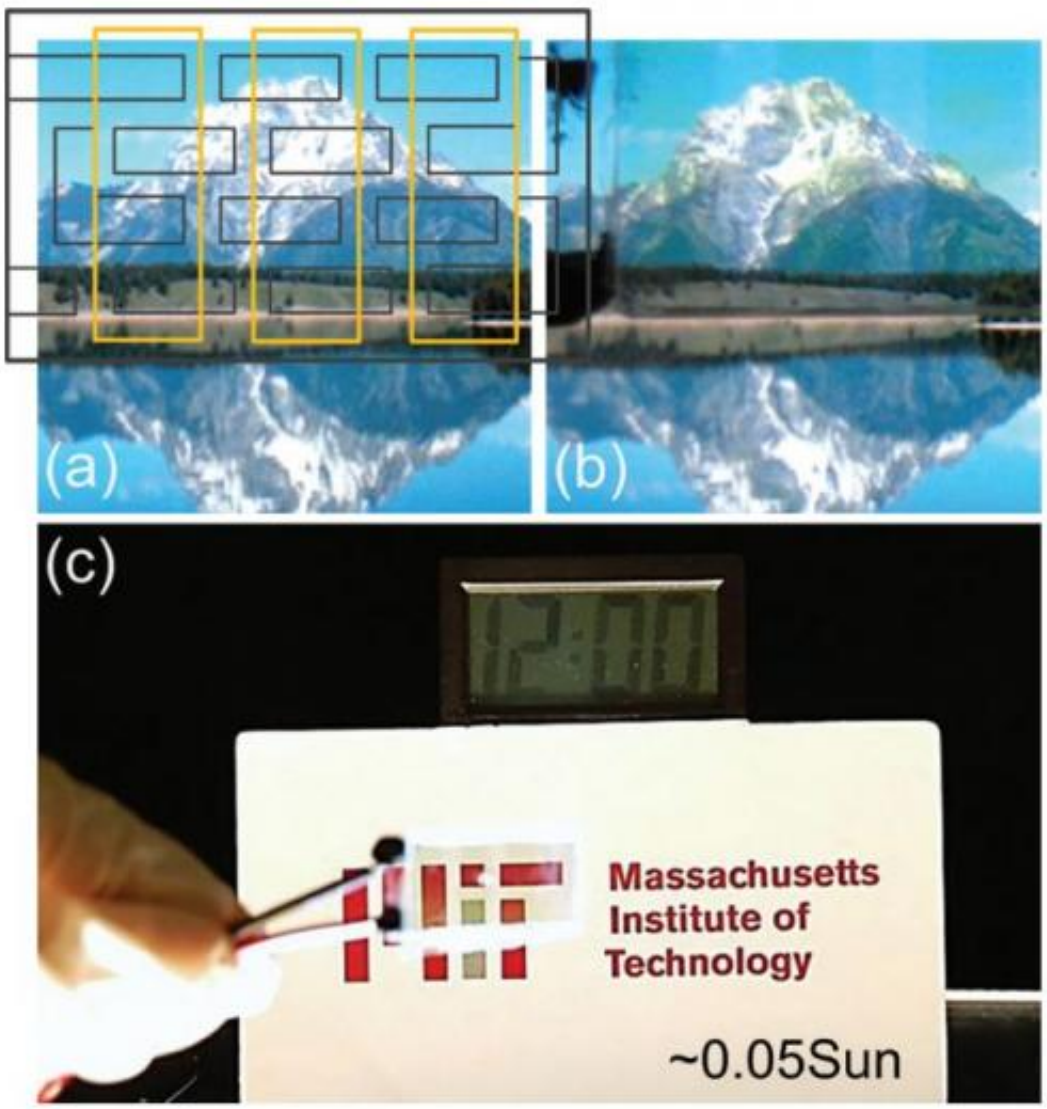

(a) Picture of the "Teton mountains" displayed on an LCD screen (b) with the fully assembled transparent solar cell in front of the picture. In (a) the anode/active layer drawing is overlaid on the same picture and the orange boxes

highlight the active layer area. ?a? and ?(b?) were taken side-by-side during the same exposure. ?(c)? Picture of the series-integrated, transparent cell powering an LCD clock illuminated with ?0.05 sun while allowing for high transparency. Credit: Appl. Phys. Lett. 98, 113305 (2011)

(Phys.org)—Can windows, tablets and e readers turn light into power? Can a surface coated with solar cells take sunlight and the glow of bulbs and change them into energy? As reported in *Technology Review*, expert scientists at a new startup called Ubiquitous Energy have those feats in mind. They want to develop transparent coatings and films that could harvest light energy when applied to buildings' windows or mobile-device screens.

The company defines itself as "a technology startup developing a portfolio of technologies that enable seamless deployment of light-harvesting functionality in the form of products and surfaces we interact with every day."

Ubiquitous Energy solar cells are made of organic layers, and they are deposited one at a time on top of a film or glass. The team uses a "spectrally selective approach" with achievements that were first outlined in a paper published in *Applied Physics Letters* in 2011. They noted how previous efforts to construct semitransparent devices focused on the use of thin active layers (or spatially segmented films) with light absorption focused in the visible spectrum, and have been limited to either low efficiencies or low average visible-light transmissivity.

They said that they demonstrated "heterojunction organic PV (OPV) cells utilizing a molecular organic donor, chloroaluminum phthalocyanine (ClAlPc), and a molecular acceptor, C_{60}, that show peak-absorption in the ultraviolet and near-infrared (NIR) (wavelength span of

λ = 650–850 nm)."

They wrote that, in combining the OPVs with selective high-reflectivity near-infrared mirror coatings, "we optimize device performance while also permitting high transmission of visible photopic light through the entire device."

The paper, "Transparent, Near-Infrared Organic Photovoltaic Solar Cells for Window and Energy-Scavenging Applications," is by Richard Lunt and Vladimir Bulovic. Both are cofounders; Lunt is an expert in organic and inorganic excitonic materials for solar energy and energy utilization efficiency.

Spun out of the MIT lab of Prof. Bulović, the company's work is still at the development stages. The focus is to improve the efficiency of the solar cells, according to Miles Barr, the president and CTO of Ubiquitous Energy. As reported in *Technology Review*, Barr is looking at ways to collect more light. Barr said the company is developing materials that gather energy deeper into the infrared.

Last year, Barr made news as a recipient of the Lemelson-MIT Collegiate Student Prize for innovative solar technologies. His approach in fabricating solar cells on everyday surfaces was singled out, and its implications for the adoption of solar power. According to the MIT award announcement, "Barr's approach, which enables solar cells to be printed directly on common materials like paper and textiles, could reduce the cost of solar energy by eliminating the need for specialized installation."

More information: apl.aip.org/resource/1/applab/v98/i11/p113305_s1
www.technologyreview.com/news/ … through-solar-cells/
www.ubiquitous-energy.com/