Nano Focus

Organic single-crystalline *p-n* junction nanoribbons fabricated

One-dimensional organic *p-n* junctions have attracted much attention due to their optoelectronic properties as well as their use as ideal systems for understanding basic charge-transport and photovoltaic behavior at organic–organic interfaces. However, fabricating organic one-dimensional *p-n* junctions is still a great challenge in the area of organic electronics. Now, W. Hu of the Chinese Academy of Sciences, A.L. Briseno of the University of Massachusetts, S.C.B. Mannsfeld of Synchrotron Radiation Lightsource, and their colleagues have used physical vapor transport growth to fabricate CuPc (*p*-type) and F_{16}CuPc (*n*-type) single-crystal nanoribbon. The synthesis of *n*-type F_{16}CuPc is based on the selective crystallization of CuPc nanoribbon as a template.

As described in the August 3rd online edition of the *Journal of the American Chemical Society* (DOI: 10.1021/ja102779x), the researchers prepared the CuPc–F_{16}CuPc (*p-n* type) nanoribbon junction through physical vapor transport and demonstrated their use in ambipolar transistors and discrete nanoribbon solar cells. The crystallization of F_{16}CuPc onto a CuPc nanoribbon as a template is based on F_{16}CuPc and CuPc similar molecular structures, lattice constants, and π-stacking along the nanoribbon axis. The ambipolar transport of the CuPc and F_{16}CuPc (*p-n*) junction nanoribbons is then characterized with balanced carrier mobilities of 0.05 $cm^2\ V^{-1}\ s^{-1}$ and 0.07 $cm^2\ V^{-1}\ s^{-1}$, respectively. The nanoribbon photovoltaic device based on such a *p-n* junction shows current rectification under AM 1.5 simulated light.

Shenqiang Ren

News

Materials Researchers

Credit: Justin Knight

Subra Suresh
Director
National Science Foundation

Subra Suresh was sworn in as the 13th director of the National Science Foundation (NSF) on October 18, 2010.

Previously, Suresh, 54, served as dean of the engineering school and as Vannevar Bush Professor of Engineering at the Massachusetts Institute of Technology (MIT). A mechanical engineer who later became interested in materials science and biology, Suresh has done pioneering work studying the biomechanics of blood cells under the influence of diseases such as malaria.

Suresh was nominated by President Obama to become the new NSF director on June 8. He replaces Arden L. Bement, Jr., who led the agency from 2004 until he resigned in May of this year.

Credit: Bill Cardoni/Bucknell U

John C. Bravman
President
Bucknell University

John C. Bravman has been named the 17th president of Bucknell University. He began his duties as president on July 1, 2010, and the inauguration was held in November.

For the last 11 years, Bravman, 52, has overseen Stanford University's undergraduate program as Freeman-Thornton Vice Provost for Undergraduate Education, and served as dean of Stanford's Freshman-Sophomore Residential College, which he founded in 1999. A world-renowned scholar in the field of thin-film materials, Bravman is the Bing Centennial Professor of Materials Science and Engineering and, since 2001, has been a professor of electrical engineering by courtesy of that department in recognition of his related achievements.

Bravman will succeed Brian C. Mitchell,who last year announced his intention to step down from the presidency effective June 30, after six years in that role.

Credit: R. Kaltschmidt/LBNL

Paul Alivisatos
Director
Lawrence Berkeley National Laboratory

Paul Alivisatos has been appointed the seventh director of Lawrence Berkeley National Laboratory, which became effective in November 2009. Alivisatos replaces Steven Chu, who was sworn in as U.S. Secretary of Energy in January 2009.

The Board of Regents named Alivisatos interim director of Berkeley Lab in January 2009. Since his appointment, Alivisatos has led the laboratory in obtaining more than $220 million in funding from the American Recovery and Reinvestment Act. In addition, Alivisatos and his management team are developing a number of new initiatives including a next-generation light source, integrating research on the carbon cycle across the laboratory, and re-invigorating the lab's safety culture and its community relations.

Alivisatos is a leader of Berkeley Lab's Helios solar research initiative, where he is spearheading ground-breaking research on artificial photosynthesis and photovoltaic technology through the creation of nano-inspired devices. □