(PoF) communications cable being developed by engineers at **Sandia National Laboratories**.

Steve Sanderson, **Titus Appel** and **Walter Wrye** of Sandia National Laboratories are co-inventors of a **hybrid cable design that uses fiber to send and regulate optical power to the communications electronics integral to the cable**. A patent is pending on the design. The developers envision their cable replacing existing copper cables in applications related to safety, such as security, explosives, explosion-proof devices, aviation and medical devices.

"The PoF cable has power limitations," Sanderson said. "It's not to be construed as a means to power your house, for example, or handle the high speeds of a computer network. But because there are growing needs of low-power sensor/control applications related to safety, having convenient optically generated power available is a tremendous benefit."

The PoF cable ends resemble a typical copper electrical cable with pin and socket connectors. However, optical interface circuits integrated into the connector housing, called a backshell, provide fiber optic transmission of both data communications and optical power. To conserve energy, optical power is delivered only on demand, Sanderson said.

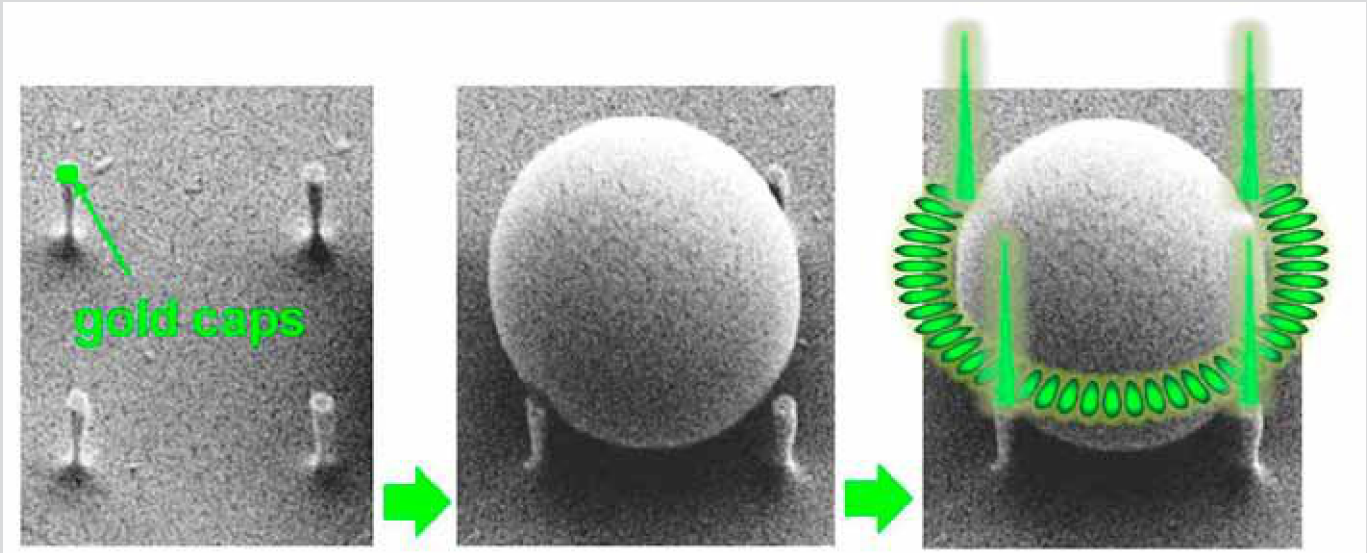
http://www.sandia.gov

Researcher at **Washington State University** and **Drexel University, both USA**, reveal in a numerical study that membrane pore surface charge density is a vital parameter in the separation through a nanopore. In this study, they have simulated high-density lipoprotein (HDL) and low-density lipoprotein (LDL) as the sample nanoparticles to demonstrate the capability of such a platform. Numerical results suggest that efficient separation of HDL from LDL in a 0.2 M KCL solution (resembling blood buffer) through a 150 nm pore is possible if the pore surface charge density is ~ -4.0 mC/m^2. Moreover, they observe that pore length and diameter are relatively less important in the nanoparticle separation process considered here. © ELECTROPHORESIS

Talukder Z. Jubery, Anmiv S. Prabhu, Min J. Kim, Prashanta Dutta: Modeling and simulation of nanoparticle separation through a solid-state nanopore, In: *ELECTROPHORESIS*, Volume 33, Issue 2, January 2012, Pages 325-333, DOI: 10.1002/elps.201100201:
http://dx.doi.org/10.1002/elps.201100201

Researchers at **Boston University (US)** investigate photonic-plasmonic mode coupling in a **new class of optoplasmonic materials** that comprise dielectric microspheres and noble metal nanostructures in a morphologically well-defined on-chip platform.

Discrete networks of optoplasmonic elements, referred to as optoplasmonic molecules, were generated through a combination of top-down fabrication and template-guided self-assembly. This approach facilitated a precise and controllable vertical and horizontal positioning of the plasmonic elements relative to the whispering gallery mode (WGM) microspheres. The plasmonic nanostructures were positioned in or close to the equatorial plane of the



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dielectric microspheres where the fields associated with the plasmonic modes can synergistically interact with the evanescent fields of the WGMs.

They characterized the far-field scattering spectra of discrete optoplasmonic molecules that comprised two coupled 2.048μm diameter polystyrene microspheres each encircled by four 148nm diameter Au nanoparticles (NPs), through far-field scattering spectroscopy. They observed a broadening of the TE and TM modes in the scattering spectra of the optoplasmonic dimers indicative of an efficient photonic–plasmonic mode coupling between the coupled photonic modes of the WGM resonators and the localized surface plasmon modes of the NPs. © ACS Nano

Wonmi Ahn, Svetlana V. Boriskina, Yan Hong, and Björn M. Reinhard: Photonic-Plasmonic Mode Coupling in On-Chip Integrated Optoplasmonic Molecules, In: *ACS Nano*, Vol. 6(2012), No. 1, Pages 951-960, DOI:10.1021/nn204577v:
http://dx.doi.org/10.1021/nn204577v

University of Illinois materials scientists **Jennifer Lewis** and **S. Brett Walker** have developed a **new reactive silver ink for printing high-performance electronics** on ubiquitous, low-cost materials such as flexible plastic, paper or fabric substrates. Most conductive inks rely on tiny metal particles suspended in the ink. The new ink is a transparent solution of silver acetate and ammonia. The silver remains dissolved in the solution until it is printed, and the liquid evaporates, yielding conductive features.

"It dries and reacts quickly, which allows us to immediately deposit silver as we print," Walker said.

The reactive ink has **several advantages over particle-based inks**. It is much faster to make: A batch takes minutes to mix, according to Walker, whereas particle-based inks take several hours and multiple steps to prepare. The ink **also is stable for several weeks**. The reactive silver ink also can print