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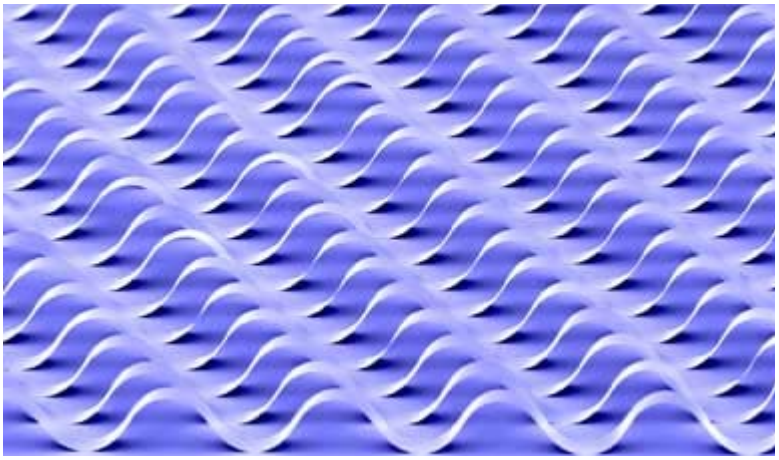
Flexible electronics could find applications as sensors, artificial mu

(*Nanowerk News*) Flexible electronic structures with the potential to bend, expand and electronic devices are being developed by researchers at the U.S. Department of Ene National Laboratory and the University of Illinois at Urbana-Champaign. These flexible find useful applications as sensors and as electronic devices that can be integrated int or biological tissues.

In addition to a biomedical impact, flexible electronics are important for energy techno accurate sensors for hydrogen.

These structures were developed from a concept created by Argonne scientist Yugan researchers at the University of Illinois led by John A. Rogers. The concept focuses on crystalline semiconductor nanoribbons in stretchable geometrical configurations with e materials and surface chemistries used in their fabrication and the mechanics of their strains.



Semiconductor ribbons with buckled profiles on polydimethylsiloxane surfaces that ar surface chemical bonding exhibit mechanical stretchability. (Image: Argonne Natio

"Flexible electronics are typically characterized by conducting plastic-based liquids tha onto thin, bendable surfaces," Sun said. "The objective of our work was to generate a subsequent technology that would allow for electronic wires and circuits to stretch like accordions leading to sensor-embedded covers for aircraft and robots, and even prost humans.

"We are presently developing stretchable electronics and sensors for smart surgical gl hemispherical electronic eye imagers," he added.

The team of researchers has been successful in fabricating thin ribbons of silicon and bend, stretch and compress like an accordion without losing their ability to function. Th these findings were published in the *Journal of Materials Chemistry* ("Structural forms semiconductor nanoribbons for high-performance stretchable electronics").

Before coming to Argonne in August of 2006, Sun worked as a research associate un at the University of Illinois at Urbana-Champaign where this project was first initiated. Argonne's Center for Nanoscale Materials late last year, he was attracted by the facilit enhance scientists' investigations in the properties of materials at nanoscale dimensio

The Center for Nanoscale Materials at Argonne integrates nanoscale research with Ar capabilities in synchrotron X-ray studies, neutron-based materials research and electr new capabilities in nanosynthesis, nanofabrication, nanomaterials characterization, ar simulation.

With the many resources at Argonne at his disposal, Sun plans to expand his researcl applications in other biological and chemical sensors.

Funding for this research was provided by the U.S. Department of Energy's Office of E Science.

Source: Argonne National Laboratory