too expensive and technologically demanding. The Texas researchers' approach, on the other hand, uses proven piezoelectric and mechanical technologies, and the cost of the prototype devices is less than $20.

The generator uses a propeller attached to a cam that causes a series of bimorphs—bidirectional piezoelectric transducers—arranged in circle around a hub to oscillate. A single bimorph made of APC 855 ceramic is capable of producing 0.935 mW with a 120-kV load, while an 11-bimorph unit produced 10.2 mW with a 4.6-kV load.

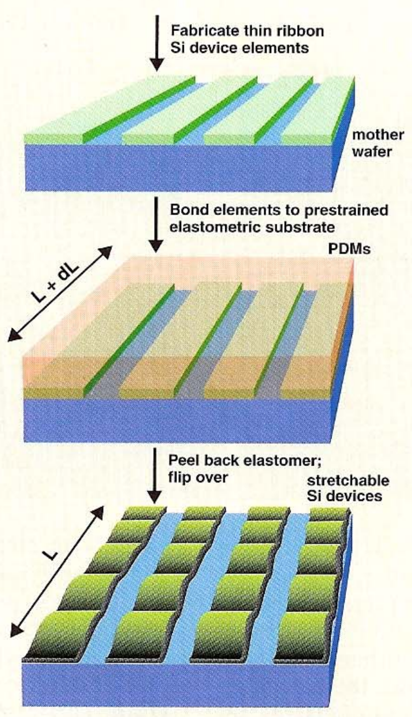
The researchers also foresee the possibility of using bimorphs to power medical devices. For instance, they suggest that an insulin pump could be created that uses vibrations from heartbeats to activate the bimorphs. For more information, call Shashank Priya at 817-272-2704, e-mail spriya@uta.edu, or visit http://mse.uta.edu/priya.html.

—Richard Comerford

Stretchable silicon promises to replace standard process

A research team at the University of Illinois at Urbana-Champaign (Urbana, IL) has introduced a stretchable form of single-crystal silicon with micron-sized wavelike geometries that can be used to build electronic devices on rubber substrates—as opposed to the rigid substrates currently used in making semiconductors. Applications could include the use of sensors and drive electronics placed into artificial muscles, structural monitors wrapped around aircraft wings, and flexible skins for robotic sensors.

The team was able to fabricate devices in the geometry of very thin ribbons on a silicon wafer using techniques similar to those used in conventional electronics. Then etching techniques were used to undercut the devices, which resulted in ribbons of silicon about 100 nm thick (see *figure*).



The process for developing single crystal silicon devices on rubber substrate has three steps.

Afterwards, a flat rubber substrate was stretched and placed on top of the ribbons. Then the rubber was peeled away, and the ribbons were lifted off the wafer, which leaves them adhered to the rubber surface. Releasing the stress in the rubber causes the silicon ribbons and the rubber to buckle into a series of well-defined waves.

The researchers tested the process by fabricating wavy diodes and transistors and comparing their performance with traditional devices. Not only did the wavy devices perform as well as the rigid devices, they could be repeatedly stretched and compressed without damage and without significantly altering their electrical properties.

For additional information, call John Rogers at 217-244-4979 or, e-mail jrogers@ uiuc.edu, or Yonggang Huang at 217-265-5072 or e-mail huang9@uiuc.edu, or visit http://www.engr.uiuc.edu.

—Christina Nickolas

High-performance 64-bit processor promises tenfold cut in power

Addressing the hot topics of low power and high speed in microprocessors, startup P.A. Semi (Santa Clara, CA) is getting ready to release a high-performance 64-bit microprocessor that claims to use one-tenth the power of current devices at the same performance level. The PA6T-1682M achieves its low-power performance via a combination of a new architecture design, process improvements, and extreme clock management techniques—there are 15,000 gated clocks on the chip.

And the PA6T-1682M does offer performance. Its dual