



Where Doping Is Legal

Souping up silicon could lead to a super-efficient world

Mizzou scientists have refined silicon using irradiation, which allows it to handle megawatts of power in applications such as bullet trains.

It also, it appears, appears in products from caulk to computer chips.

John Farmer, senior research scientist at the MU Research Reactor (MURR), has helped shape silicon's rapidly growing role in electronics during the past three decades. Silicon circuits handle the shock-absorber role that rows of vacuum tubes formerly played, he says. They decrease wear and tear by absorbing the power spikes that come every time an electronic device turns on or off.

And silicon chips are compact. "If a smartphone were built using vacuum tube technology, it would be the size of a football field, one meter thick," he says. "It would consume more power than the cities of St. Louis and Kansas City combined."

Farmer and others at MURR have greatly refined silicon through doping, or irradiation. When bombarded with neutrons, silicon partly transmutes into phosphorus, which makes it a first-rate electrical conductor. Doped silicon is the material to handle megawatts of power — 4,000 volts, 1,000 amps — in applications such as the bullet trains in planning stages in California.

Silicon, the 14th element on the periodic table, is about as common as dirt. Or sand, to be precise. It makes up about a quarter of the Earth's crust and, depending on how it's handled,

Neutron-doped silicon is already making automobiles greener, Farmer says. Specialized electronic devices in hybrid cars require two wafer-thin slices of doped silicon 5 inches in diameter.

And doped silicon will make next-generation power grids efficient by vastly reducing power loss during long-distance transport of electricity. The high-grade silicon will all but obliterate the current 30 percent energy loss.

MISSOURI PRESS REDUX On July 16, officials announced the University of Missouri Press will reopen with a new model that emphasizes digital technologies and student participation. Speer Morgan will direct the press and continue to edit *The Missouri Review*.

In May 2012, University of Missouri System President Timothy M. Wolfe announced the press's closing and alluded to the digital model. At the reconstituted press, faculty and students will work together similar to how journalism students and faculty work side by side at the *Columbia Missourian*. Press staff will explore ways to make scholarly materials more available in this digital age. "In about a year, we should have our feet under us," Morgan says. The press will honor its contracts with authors for printed books while developing a greater online presence.

The plan is for Mizzou to resume governance of the press, which had been managed by the UM System since 1967.

Briefly

In July, **Thomas Hiles** began work as Mizzou's vice chancellor for development and alumni relations. He had served as vice president for institutional advancement at Bowling Green State University. Hiles replaces David Housh, who retired after leading MU's record-breaking \$1 billion For All We Call Mizzou campaign.

The June 22 state budget revision cut higher education funding by 1 percent for FY2013 rather than the expected 7.8 percent, which left the UM System with **\$26 million** to reallocate. Mizzou's share is **\$11 million**. Campus initiatives could include merit-based raises for faculty and staff; building maintenance; and student enhancement, such as financial aid and research.

The National Institute of General Medical Sciences recently recognized MU biochemistry **Professor Gerald Hazelbauer's** scientific contributions by granting him a \$5.5 million Method to Extend Research in Time Award.

MU officials and artist **Paul Jackson**, MFA '92, recently reached an out-of-court agreement leading to the removal of the Tiger Spot from Lowry Mall. Jackson completed the mosaic in 2001, but it deteriorated, and litigation arose over its status. Jackson agreed to pay Jackson \$125,000 to relinquish rights to the work.