The New York Times

TUESDAY, OCTOBER 11, 2005

Science Times

FINDINGS

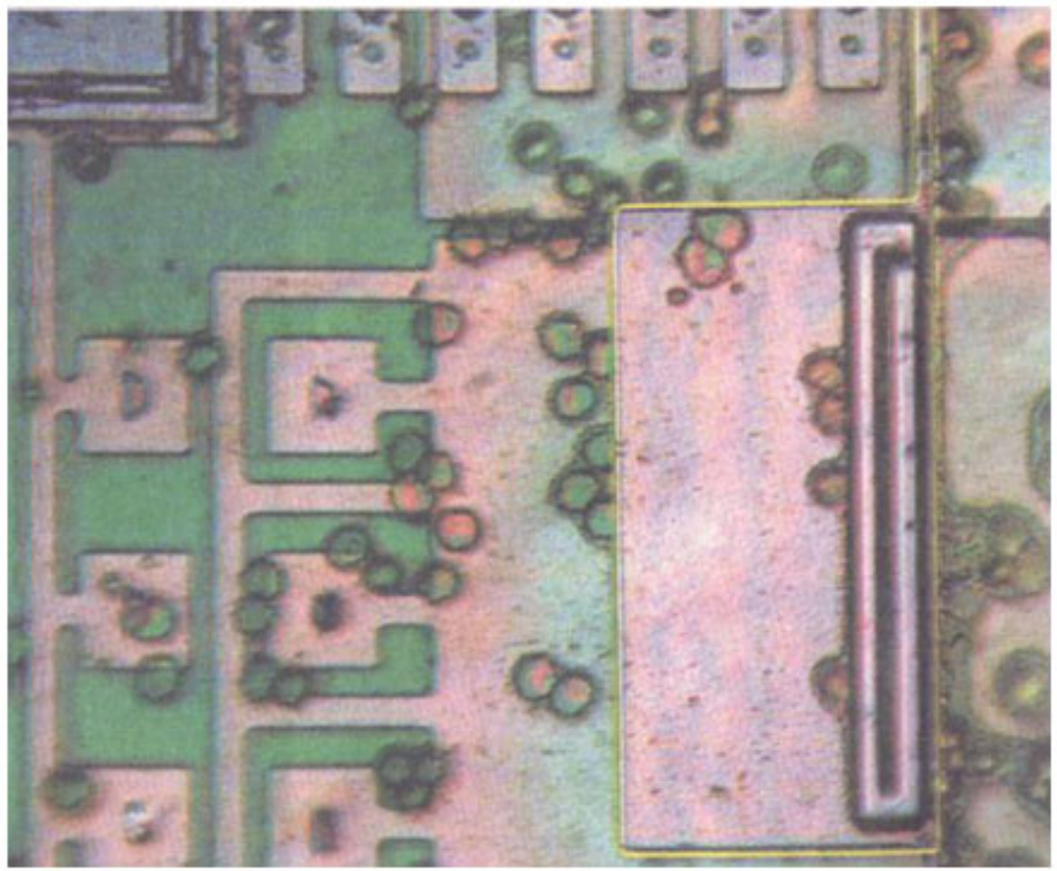
At Dartmouth, a Remote-Controlled Robot (You Can See It if You Squint)

For a steerable piece of dust, look somewhere at Dartmouth College.

Researchers there have built what they say is the world's smallest untethered, controllable robot. When placed on a penny, it looks like a mole on the side of Lincoln's chin, measuring a hundredth of an inch by one four-hundredth of an inch.

A traffic jam of 200 of them would stretch the length of an M&M.

The robot contains no motors or circuitry. Rather, it is a carefully carved piece of silicon that moves across a special surface that contains an embedded electrical grid. The main rectangular piece has one edge bent downward; from the side, it looks like an L that has toppled forward.



Dartmouth's microrobot, above and outlined in yellow at right on top of a chip, may find uses in biomedicine. The spheres are human blood cells, placed as a size comparison.

Donald Laboratory

"You can think of it as a business card with a fold at the end," said Bruce R. Donald, a professor of computer science and leader of the research team.

When an electrical voltage is applied, the silicon buckles, and the long leg of the L is pulled down against the surface. When an opposite voltage is applied, the silicon rectangle pops back and pushes the robot forward. "It crawls along like an inchworm," Dr. Donald said.

An article describing the microrobot will appear in The Journal of Microelectromechanical Systems. At top speed, the robot zooms around at nearly a hundredth of an inch a second.

To turn the robot, a stronger voltage pulse lowers an arm extending off one side of the rectangle. At the end of the arm is what looks like a tiny lollipop with a pointy thorn at the center. The lollipop snags the surface, and the robot runs in circles around it. Another pulse lifts the arm, and the robot heads straight again.

Dr. Donald said more sophisticated versions of such robots might one day be used to inspect or fix chips or interact with individual cells.

Robots of different shapes could snap together to build larger structures, he said.

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