

Big Hopes for the Smallest Mobile Machine

From the expanding field of shrinking robots comes a meandering machine no thicker than a human hair—the small-

est mobile robot ever built. Developed by researchers at Dartmouth College, the tiny crawler is less than one-tenth the size of previous untethered controllable robots, and it is thousands of times as



light. The microbot scampers forward by taking thousands of inchwormlike steps per second, each the length of a cold virus. It turns by clamping a foot to the floor and pivoting.

The robot draws its power and the signals that command its movement from the specially designed electrostatic surface it crawls on. However, its creators say that reworked versions of the bot could someday be set loose on a variety of materials to do its thing—or many things. Future iterations may be designed to perform cell manipulation in the lab, repair integrated circuits in computers, and explore hazardous environments. The Department of Homeland Security helped fund the project; it is possible that the microbots could be used to hide secrets or authenticate identities at important meetings.

The thought of a mite-size robot with the ability to crawl on skin or skulk inside the Pentagon may make some people uneasy. But Bruce Donald, the lead inventor, believes the benevolent uses of a microbot outweigh the possibilities of James Bond-villain scenarios. "I'm hoping," he says, "that this will be developed for benign applications." —Susan Kruglinski

This tiny robot, $\frac{1}{100}$ of an inch wide, crawls like a worm and pivots on its silicon foot.