



### Shape-Shifting Robot

4 April 2005

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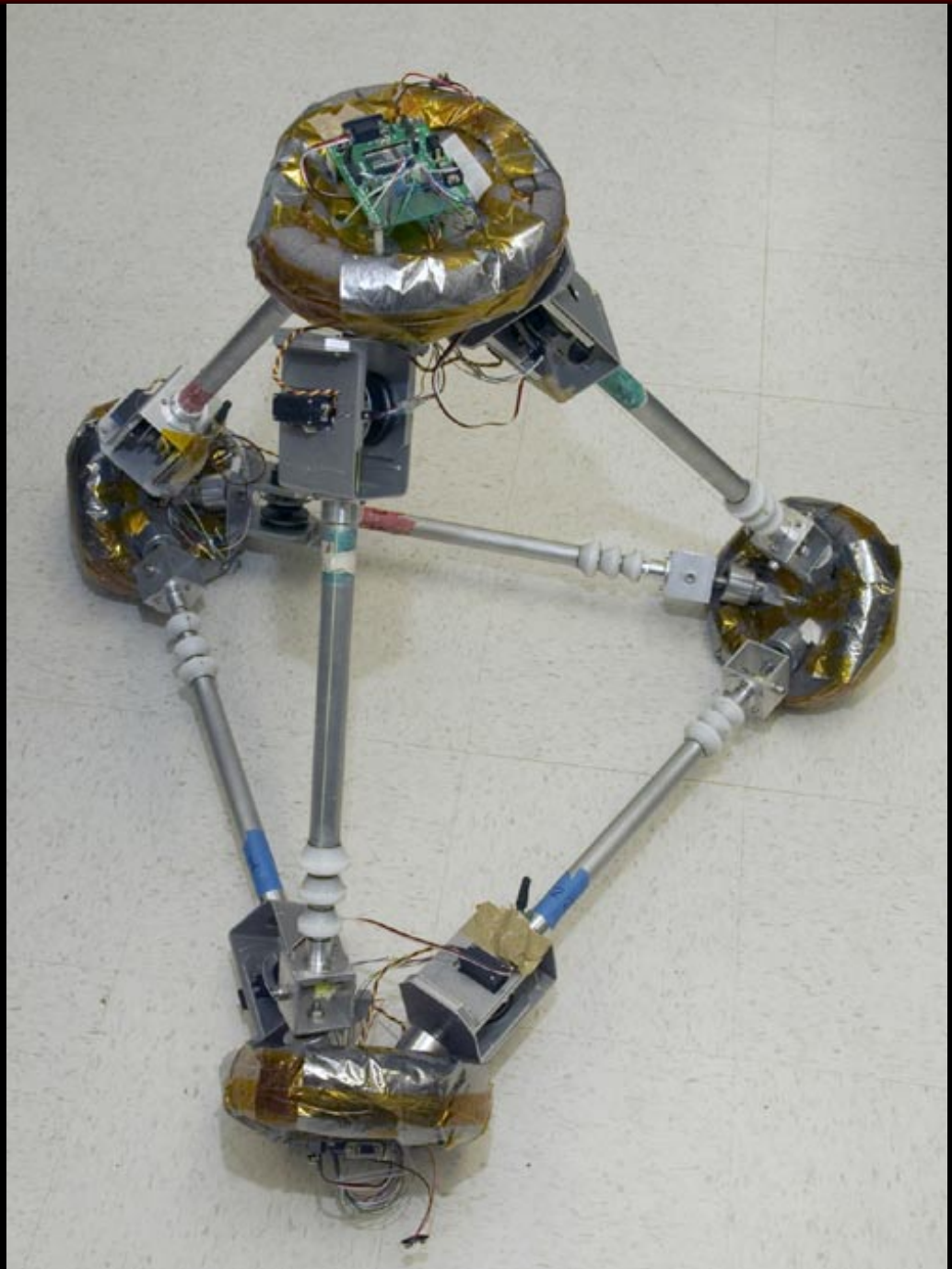
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## Shape-Shifting Robot

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NASA engineers have unveiled a shape-shifting rover robot called "TETwalker." Named for its tetrahedral shape, the prototype has electric motors at each corner, or node, of the pyramid. These motors connect to telescoping struts, which form the sides of the pyramid. The walker moves around by changing the length of the struts, which shifts the bot's center of gravity and causes it to topple over.

A robot designed to topple over on a planet millions of miles away may sound like a bad idea, but engineers intend for the walker to do just that.

"If current robotic rovers topple over on a distant planet, they are doomed -- there is no way to send someone to get them back on their wheels again. However, TETwalkers move by toppling over. It's a very reliable way to get around," said Stephen Curtis, principal investigator for the Autonomous Nanotechnology Swarms (ANTS) project at NASA.

The team is now working to miniaturize the robots by replacing the motors with Micro- and Nano-Electro-Mechanical Systems. They will likewise replace the struts with metal tape or carbon nanotubes to further reduce the robot's size, making it easier to pack large numbers of the walkers into a rocket.

The engineers are also working on computer models to string hundreds of the mini-robots together, creating a swarm that will be extremely flexible and capable of carrying out many tasks. They hope that the swarm of robots will be able to move snake-like over a planet's terrain, and, upon discovering something of interest, "grow" an antenna to transmit data to Earth.

[Bjorn Carey](#)

Credit: NASA