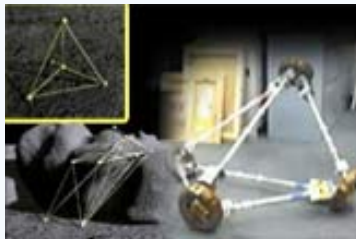




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**New Robot Shifts Shape**

By Bill Christensen

Technovelgy.com

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06:41 am ET

A tetrahedral walker, or TETWalker robot, was demonstrated recently at NASA's Goddard Space Flight Center. This bot is a prototype member of an autonomous nanotechnology swarm that can alter their shape to flow smoothly over rocky terrain, or combine to create structures like communications antennae and solar sails.

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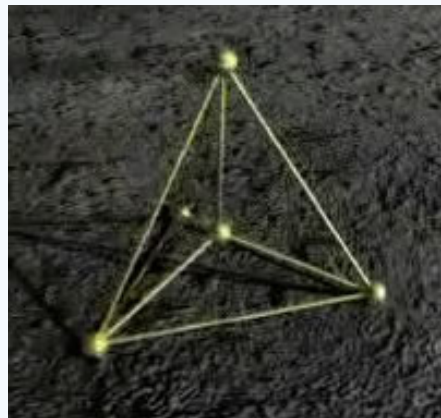


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(TETWalker Prototype)

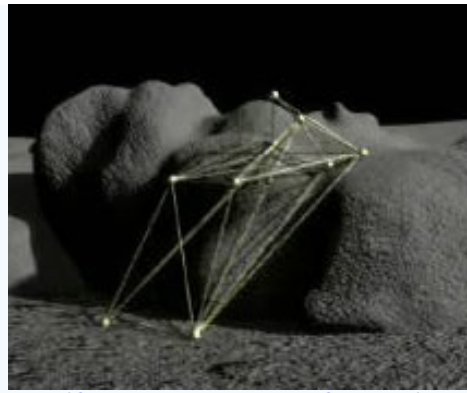
A robot shaped like a tetrahedron (a four-sided geometric figure) can "walk" by moving its center of mass to the side until it tips over in that direction. Repeating this movement results in a kind of side-to-side walking pattern.



(Simple TETWalker Concept)

If you add the ability to telescope the rods connecting the nodes of the tetrahedron, you get a robot that is capable of moving over obstacles. And the pyramid is a very strong and stable structure:

"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 Dr. Steven Curtis, principal investigator for the project.



([Complex TETWalker Concept](#))

The prototype was tested in Antarctica in January for harsh Mars-like testing. Motors may be placed at the center of the struts to improve reliability. The Autonomous Nanotechnology Swarm team (ANTS) believe that TETWalkers can be miniaturized using micro-electro-mechanical systems; by retracting their struts fully, TETWalkers can be stored for space voyages in very small spaces.

Eventually, it is hoped that the tiny 'bots will be able to swarm together to construct small objects or structures, like communications dishes.

In his 1995 novel *The Diamond Age*, Neal Stephenson wrote about swarms of tiny [aerostats](#) that used a [grid formation](#) to defend their assigned territory. Although they functioned as independent devices, their swarm behavior let them respond as a group to threats.

Read more at [NASA Tests Shape-Shifting Robot Pyramid For Nanotech Swarms](#); check out the [autonomous nanotechnology swarm](#) website (with cool concept videos).

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