

**(CNN)** -- DARPA, the U.S. Defense Advanced Research Projects Agency, funds some of the world's most far out, forward-thinking research into new military technology.

Something like Q Branch in the James Bond movies, DARPA is constantly working on what it describes as "radical innovations." But where James Bond has the character Q to build his exploding pens, DARPA often funds private companies and external organizations to develop its high-tech hardware.

It is currently funding research into, among other things, a robot ostrich, a flying car and a plane that could stay airborne for five years at a time.

While some of the technologies it is supporting might seem more suitable for science fiction than the battlefield, the fact that DARPA is willing to fund them is a sign they are at least possible -- if not always plausible. Don't forget, DARPA's Arpanet program is widely credited as being the precursor to today's internet.

So here are some of DARPA's most incredible research programs, which could change the future of warfare, and might one day have applications that extend far beyond the military.



Disc- Rotor -- artist's impression

### **Disc-Rotor Compound Helicopter**

The Disc-Rotor is a collaboration between DARPA and Boeing. Hoping to marry the best features of a helicopter and an airplane, the Disc-Rotor program aims to develop a new type of aircraft capable of seamlessly transitioning from hovering like a helicopter to flying like a plane.

The design is propelled by rotor blades that extend from a central disc, letting it take off and land like a helicopter. But those blades can also retract into the disc, minimizing drag and letting the Disc-Rotor fly like a plane, powered by engines beneath each wing.

### **Vulture**

DARPA's Vulture program is developing the technology to enable an "airborne payload" to remain in the sky for more than five years at a time, performing intelligence, surveillance and communication missions. In practice, that means developing unmanned aircraft that act like satellites.

Boeing is again working on the project, researching its "SolarEagle," a solar-powered, unmanned craft with a 120-meter wing span. It is designed to operate at altitudes above 18,000 meters. Boeing hopes it will make its first demonstration flight in 2014.

### **ChemBots**

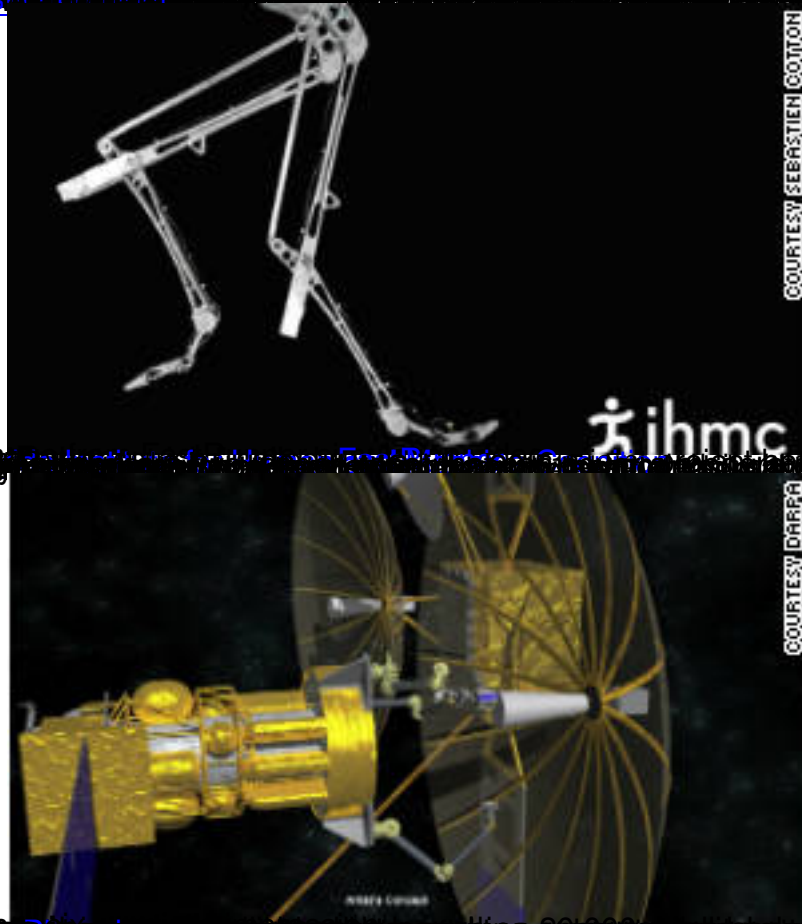
Tech company [iRobot](#) worked with DARPA on its "ChemBots" program. The aim was to build soft, flexible robots that could deform their bodies to move through openings smaller than themselves (e.g. under doors) to carry out covert tasks.

iRobot used a transitional -- or "jamming" -- material, with properties of both a solid and a liquid, to create a flexible robot that can crawl on six floppy legs. While DARPA's funding has now expired, iRobot is still researching soft robotics and "jamming" technology.



COURTESY IROBOT

ground flight



COURTESY SEBASTIEN COTTON

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