

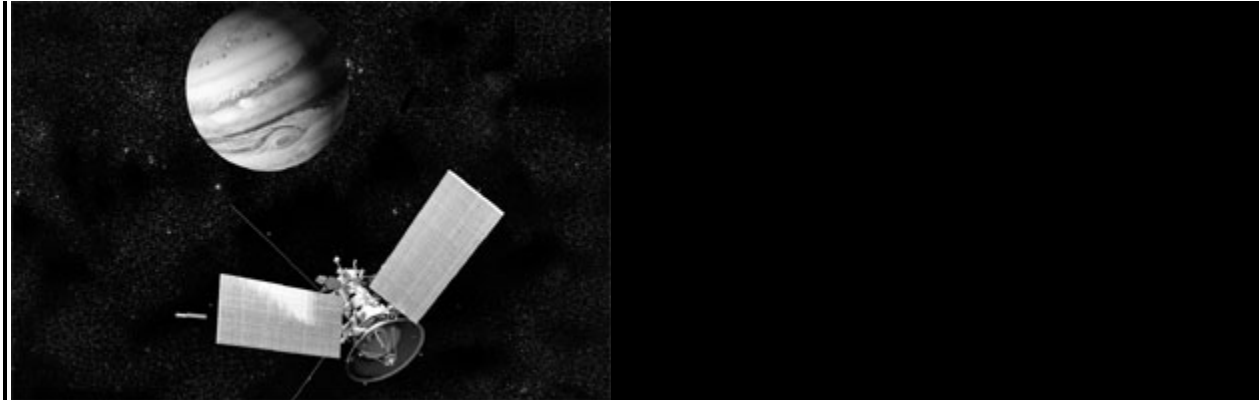
# US agency dreams of sending people to stars

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Alpha Centauri or bust. The government agency that helped invent the Internet now wants to do the same for travel to the stars.

In what is perhaps the ultimate startup opportunity, Darpa, the Defense Advanced Research Projects Agency, plans to award some lucky, ambitious and star-struck organisation roughly \$500,000 in seed money to begin studying what it would take—organisationally, technically, sociologically and ethically — to send humans to another star, a challenge of such magnitude that the study alone could take a hundred years. The awarding of that grant, on November 11—11/11/11—is planned as the culmination of a yearlong Darpa-NASA effort called the 100-Year Starship Study, which started quietly last winter and will include a three-day public symposium in Orlando, on September 30 on the whys and wherefores of interstellar travel. The agenda ranges far beyond rocket technology to include such topics as legal, social and economic considerations of interstellar migration, philosophical and religious concerns, where to go and—perhaps most important—how to inspire the public to support this very expensive vision.

The Darpa plan has generated buzz as well as befuddlement in the labs, pubs, diners and Web sites that ring NASA centers both physically and virtually, where the dream of space travel has never died and where a few stubborn bands of scientists and engineers, fuelled by science fiction dreams and prophecies, are designing spacecraft that could cross interstellar space, incubating a technology and preserving it for the day when it will be used. “If you want to have a hobby, why can’t it be designing an interstellar spacecraft?” said Andreas Tziolas, who teaches at the University of Alaska and directs Project Icarus, a worldwide volunteer effort to design a spacecraft that could carry a scientific probe to a nearby star—perhaps Alpha Centauri, 4.4 light-years from here—in a trip that would take less than 100 years.

“This is what we do,” said Louis Friedman, former executive director of the Planetary Society, in Pasadena, California, which bills itself as the world’s largest public space organisation. Many scientists wonder if life, especially intelligent life, exists beyond Earth. Some day, the interstellar dreamers vow, the life out there will be us.

People like Tziolas say the technology already exists or will soon exist to send instruments and perhaps even people to nearby stars, although a human flight could cost hundred of trillions of dollars. The half-million dollars Darpa will award is not enough to build a starship or even to buy a modest office in which to imagine one—but is enough to start serious fund-raising and, perhaps to invite ridicule from critics of government spending. An actual human launching is at least a couple of centuries away and, barring the invention of Star Trek -like warp drives, could take additional centuries to complete. Whoever goes on such a journey will not be coming back.

But there are plenty of reasons that humans will eventually summon the political will to make the trip, scientists say, if not for human restlessness that has taken us out of the caves and across the oceans, then to escape being wiped out when the killer asteroid appears or the Sun boils the oceans, which it will do in a couple of billion years. Another lure could be the discovery of a habitable planet elsewhere, something that could happen in the next few years through the efforts of NASA’s Kepler satellite and related astronomical efforts, according to Jill Tarter, an astronomer at the SETI Institute in California, who has devoted her life to the search for extraterrestrials.

David Neyland, Darpa’s director of tactical technology, is at pains to point out that the goal of his project is not an interstellar spacecraft, only a business plan for designing one. The search, he explained, is for an organization, presumably private, that can develop the interstellar vision without government help, carrying the load for the next 100 years, developing valuable technological offshoots the way investing in computer protocols enabled the Internet. (The time frame was inspired by Jules Verne, whose novel *From the Earth to the Moon* was published in 1865, 104 years before it came true.)

After this November, whoever it is will be on their own. “We don’t intend to carry it forward,” Neyland added. “Darpa hands the keys over to this entity, and we wish them well.”

Interstellar travel is a tall order. It would take Voyager 1, humanity’s fastest artifact, now travelling 38,000 miles an hour relative to the Sun, more than 70,000 years to reach Alpha Centauri, if it were headed in that direction.

In the late 1950s and early 1960s, a group of physicists led by Theodore Taylor of General Atomics and Freeman Dyson of the Institute for Advanced Study proposed propelling a ship by the pressure waves from atomic bombs dropped one after another out of the back, every three seconds. Such a spacecraft, they calculated, could reach Jupiter in a year but would take hundreds of years to reach Alpha Centauri.

The British Interplanetary Society used a more benign form for this propulsion idea in its interstellar spaceship study, Project Daedalus, in the 1970s. Their spacecraft would be powered by tiny thermonuclear explosions caused by compressing pellets of deuterium and

helium-3 with laser blasts. It would carry a 500-ton scientific probe to Barnard's Star, 5.9 light-years away, in about 50 years, reaching a top speed of 12 percent of the speed of light along the way.

Tziolas said, "That was the very first study that proved it's possible with knowledge we have now to travel to another star." *Dennis overbye*

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