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Just 120 Trillion Miles From Home

By DENNIS OVERBYE
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How soon till we can get to the Goldilocks planet? Don't cash in your frequent flier miles yet.

Astronomers announced last week that they had found what might be the first habitable planet outside the solar system. Known poetically as Gliese 581c, the new planet is only five times as massive as the [Earth](#) and inhabits a sweet zone around a dim red star in Libra where it is neither too hot nor too cold for liquid water. The star and its retinue of planets are only 20 light years away. "We could go there," enthused Dimitar Sasselov, an astronomer at the Harvard-Smithsonian Center for Astrophysics, noting that 20 light years is next door in a galaxy 100,000 light years across. But he was speaking for the very, very long term. However near cosmically, the Gliese planet is still about 120 trillion miles away. Voyager 1, now leaving the solar system at a speed of about 39,000 miles per hour, would need more than 300,000 years to travel that far.

Physicists and engineers point out, however, that it is possible to attain much higher speeds with spacecraft that undergo a gentler but steady acceleration throughout the trip, rather than getting a short violent boost at the beginning like Voyager and current rockets do. Lawrence Krauss, a physicist at Case Western Reserve University, and author of "The Physics of Star Trek," said that a ship that could maintain an acceleration equivalent to the gravity felt on Earth would attain a velocity of half the speed of light in three months.

The technology for that much oomph is nowhere in sight, but [NASA](#) has experimented with gentler versions like solar sails, in which the spacecraft is propelled by sunlight, or ion drives, pioneered on a spacecraft named Deep Space 1, which visited a comet in 2001, in which high-energy particles do the propelling. This year a new spacecraft, Dawn, will use ion propulsion to begin a cruise around the asteroid belt. But even ion drives have to carry prohibitive amounts of fuel to reach the stars, said Marc Rayman of the [Jet Propulsion Laboratory](#), and Dawn's project system engineer.

It would take Dawn 10,000 days and 5,000 pounds of propellant to get up to 150,000 miles per hour, which is only .02 percent of the speed of light, "which is nothing," said Dr. Rayman.

"That's an illustration of how daunting this travel is," he said. "The distances are vast, the challenges are extraordinary."

"I don't have any doubt that humankind will eventually have the technology to send spacecraft that distance," he said, adding, "I have no idea how it will be done."

Dr. Sasselov said that in the long run, in order to survive planetary catastrophes, we would want to make the trip, by whatever means.

"We don't have to go next year or even in the next 20 years," Dr. Sasselov said. But eventually, he said, "if we figure out our human affairs down on here on Earth, we'll want to be moving along."

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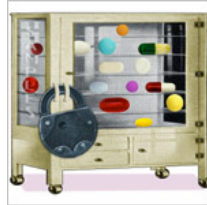


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