

Place your bets on interstellar flight

Sir, More than 30 years ago members of the BIS conducted the first feasibility study about sending a spacecraft to the stars. The *Project Daedalus* team, led by Alan Bond, came to the conclusion that interstellar flight is feasible - with the Daedalus design placing "a very approximate lower limit to the time at which such missions would become possible, probably the latter part of the 21st century".

Can there be other, perhaps less ambitious spacecraft designs realised sooner? Can we promote and foster ideas and projects which eventually lead to launching a truly interstellar probe, maybe as early as 2025?

Of course, everybody knows there are many obstacles on the way to the stars. First of all, think of the huge distances an interstellar craft should cover - Proxima Centauri, the closest stellar neighbour to our Sun as known today, is about 4.24 light years away, which is about 6,800 times the distance to Pluto.

Daedalus intended to overcome such distances in less than 50 years. The motivation felt to set such a limit was the length of a human career lifetime, which can maybe be stretched up to 40 years.

Dropping the assumption that we have to reach our stellar destination within such a short time (definitely short on the cosmic scale), today we have some good propulsion alternatives quickly at hand.

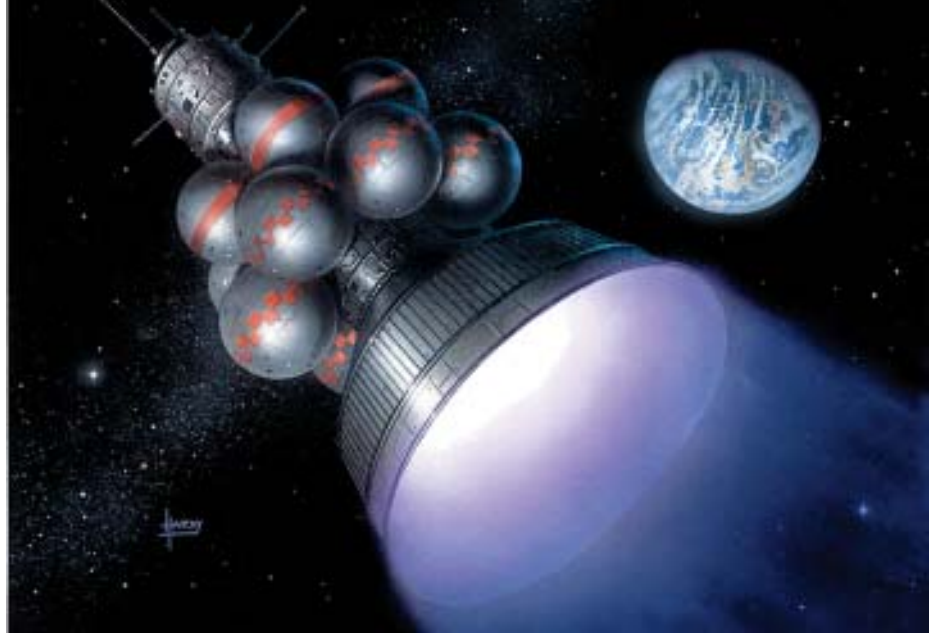
Think of advanced ion engines and solar or electric sails, to name but a few. Recent technical development on these areas point to possible travel times of around 2000 years for a Centauri mission. There is also a rapid development in nanotechnology and artificial intelligence, both enablers for interstellar travel.

We do not have to search long for motivations for interstellar travel. They range from the seemingly ever-existing challenge of the stars, up to arising fears about possible near-term existential risks for humanity, to list the two extremes.

Finally, consider our recently invented powerful tool for collaborative work, the internet, and the emerging global social networks within it as well.

Putting together the three lines of reasoning I came up with a challenging prediction: "The first true interstellar mission, targeted at the closest star to the Sun or even farther, will be launched before or on 6 December 2025, and will be widely supported by the public."

I note here that making a provocative, but accountable, prediction may help to inspire



The BIS Daedalus craft embarks on a journey to the stars in this original painting from the mid-1980s by David A Hardy.
www.astroart.org

discussion and keep people thinking.

The Long Bets website is described as a public arena for "enjoyably competitive predictions, of interest to society, with philanthropic money at stake".

So, I went there and made my prediction. Interestingly enough, my friend Paul Gilster picked up the ball immediately. We agreed on the terms of how to judge the outcome, put our money to the table, and named the charities who shall get the winner's money.

One of the terms we agreed upon was to decide the outcome of the bet should be a planned mission duration of less than 2,000 years, imposing a minimum average velocity of about 650 m/s or 137 AE/year for a Proxima Centauri mission. In comparison, Voyager 1 has a velocity of 17.1 km/s or about 3.6 AU/year).

So, let us think a moment about what kind of things such a spacecraft could accomplish during the journey? A simple calculation reveals that cruising with this velocity, our Long Bet 395 will in Year 1 pass through the Kuiper belt and reach the heliosheath at about 100 AE.

In Year two it would leave the heliosphere

at about 200 AE distance, and then sometime in Years five to 10 pass the Sun's gravitational focus between 550 and 1,000 AE. Around Year 20 it would approach the Oort cloud.

All the time, the spacecraft could gather tracking data for investigation of the Pioneer anomaly (see page 28 of this issue). Finally, in Year 2,000, Long Bet 395 reaches the Centauri system. Plenty of exploration on the way, even for a human career of 40 years!

Any time I talk about interstellar flight people express interested. It seems to be a really captive challenge - so why not think of creating a competition, starting with a contest for student projects about mission studies, in accordance with the terms our interstellar bet?

I believe such a contest would make a good case for paving the way from imagination to reality. And after the contest the hope expressed by the Daedalus team that "...the results of (the) study will bring the day when mankind will reach out to the stars a step nearer" will definitely be one step closer to reality.

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Why we go Into space

Sir, Back in 2003 I attended, and recorded, a lecture at the British Interplanetary Society by the astronaut Jack Lousma, veteran of Skylab and Space Shuttle missions.

It was a talk which I found inspirational. Lousma managed to convey, in a way I've seldom heard before or since, the profound nature of the experience of being in space and looking down on the ever-changing surface of the Earth.

I've created a short (three minute) edited sequence from the talk using music and pictures of the Earth, and put it on YouTube. If you would like to see it, log onto YouTube, and do a search for 'Lost in a Sea of Stars'. I hope you agree with me that Jack Lousma manages to convey why we go into space.

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The editor welcomes letters and emails for publication but regrets that he is unable to acknowledge or reply individually. Those sending letters via email (sf@bis-spaceflight.com) should remember to include their address. Letters may be edited.