

Lifeboat Foundation's Response to DARPA's "100-Year Starship" Request for Information

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The Lifeboat Foundation proposes creation of two new organizations to facilitate the vision of interstellar flight and the development of enabling technology. We think that DARPA's requirements call for two organizations, one a nonprofit organization that can access philanthropic donations and subsist on a relatively low budget, the other a for-profit organization that can access capital markets and capitalize on marketing opportunities. A key issue is how to do this with the limited funds that DARPA contemplates.

1) The nonprofit sector can do important things with limited funds. An example is development of the Linux computer operating system, created by volunteers under the open source model. The Lifeboat Foundation is a nonprofit organization that has experience in getting things done with limited funds. We have 1,400 members on our advisory boards. We did this with a budget in the range that DARPA contemplates, a budget spent mainly on mission-relevant programs. Visit <http://lifeboat.com> . See our board members at <http://lifeboat.com/ex/boards> .

We propose creation of a new nonprofit organization, tentatively named the StarSeed Foundation. It will be independent of the Lifeboat Foundation so it can focus on its unique mission. However, as a sibling of the Lifeboat Foundation, it will have access to our many advisory boards, allowing approach to complex issues from multiple perspectives. We have ties with many disciplines, collectively belong to many professional organizations, can reach many audiences through our professional and popular writings, and have a network that covers physical, biological, and social sciences and extends into art, history, and theology. We have members from many countries. We speak the language of the private sector since we have many entrepreneurs and employees of private R&D organizations. We can address technical and societal agendas, and have the intellectual tools and contacts to build broad support.

The StarSeed Foundation will focus on communicating the importance of star travel, and on encouraging others working in this field. We plan to work actively to seek donations and grant support. However, as a nonprofit that will be staffed mainly by volunteers, the StarSeed Foundation can rightsize and subsist on a small budget, and therefore can be expected to continue indefinitely, for a hundred years or more, despite vagaries of funding. Nevertheless,

we hope for reasonable funding since without that we waste the opportunity. We hope for at least a salaried leader and minimal support staff. We hope to support program areas such as prizes, grant awards, publications, conferences, etc. We contemplate working with the entire scientific and research community and with nonprofit, public, private, and educational organizations. We anticipate working with the news media, among other things touting the utility of advances in other fields to star travel, so that star travel shares a bit of their spotlight.

2) A private sector organization can start up with limited funds by accessing capital markets, or (in the case of a large organization) by making a decision to invest corporate funds.

Our group has discussed many business plans for a private sector organization. For example, a research group developing starship-enabling technology might find early implementations or spinoffs that would make money. Technologies such as rotating tethers or lasers to increase exhaust velocity might reduce cost to orbit enough to make space-based solar power quite profitable. [Our Keith Henson has worked on this.] Other spinoffs are suggested below. We suggest that a private group be created for several reasons: a) The Lifeboat Foundation would not bid on the private sector portion of an RFP, but some of our members might. b) An excellent idea may be presented by a private entity. c) We want to present our concept that both private and nonprofit groups are needed to produce both an “investment vehicle” and an entity that will last.

The risk inherent in the private sector option underlines the value of a parallel nonprofit organization that would, as a project, maintain plans for routes to starship-enabling technology, including pre-competitive level ideas on how to capitalize on spinoffs. These plans would be published and available to any private startup or larger organization that might want to compete with any other to take a crack at implementation. These plans would remain flexible so that they could accommodate large future organizations that may have the strength, money, technology, and/or political clout to implement this project. The organizations that implement these plans may turn out to be a consortium or a competitive field of organizations. If the private sector organization implemented as per this proposal to DARPA is not successful, the StarSeed Foundation will retain the seeds to establish multiple future versions of that organization.

The relative cost-effectiveness of the nonprofit and private sector approaches depends on the field of bids. We suggest that DARPA issue an RFP for each sector since the ideal organization to implement these requests may differ by sector. We suggest that DARPA retain the capacity to reject all bids in one sector and divert funds to the other sector.

Program ideas—nonprofit

- Award StarSeed prizes to motivate researchers. Award fellowships when our budget permits.

- Develop a participation system: proposal requests, conferences, essay competitions, publications, and media events that allow all individuals to feel that they are part of StarSeed.
- Propose conceptual technical designs for potential starships, and plans for implementation of travel and settlement including social organization, governance, etc. In addition to their heuristic value for developing interstellar travel, these plans and associated graphics will give the public a vivid image of StarSeed's goals. Offer services as technical advisors to the media.
- Develop a Master Plan (Star Plan) that by defining progressive milestones, and by judicious updates as progress develops, can keep a continuous focus and momentum on the initiative for 100 years. Those developing the plan will monitor technical developments and suggest areas that might be ready for commercial development, perhaps seeding new businesses.
- Offer global media events (Star Shows) to obtain universal dissemination of the star travel goal with participation of a global audience through television, the internet, and other media.

Program ideas—private sector

- Sale of stock will allow individuals to participate in this aspect of preparation for star travel.
- The first interstellar probes will be robotic or have robotic and AI components. The mission may require closed system ecology, hibernation induction, innovative medical technology, power technology, propulsion technology, and many other things that have commercial applications. Work in any of these areas might produce results that could be capitalized.

Lifeboat Foundation Interest in Interstellar Travel

We are called the Lifeboat Foundation because we have a dual view of technology. We are strong supporters of technology because we see it as transformative. However, we also see technology as subject to risk that should be addressed with appropriate mitigation (lifeboats). The risk aspect of our mission is important for advocacy of travel to the stars. A motivation for interstellar flight is the safety it provides for the human race. Self-sufficient settlements away from Earth are precisely the lifeboats that the Lifeboat Foundation (and many others) advocate. Lifeboat has members who belong to many other relevant organizations and we have ideas that speak to many aspects of the DARPA vision of travel to the stars.

Some of our folks are intrigued by the prospect of exponentially increasing technology. The prospect of such an increase has generated excitement attached to the prospect itself, but also attached to the application of such an increase to the facilitation of expansion to the stars.

Some of our folks are intrigued by the prospect of fostering scientific creativity and several of our top science fiction authors continue to inspire young people to choose scientific careers and to enhance the vision of transformative technology and of travel to the stars.

Some of our folks are intrigued by the prospect of space flight within the solar system and outside of it. We have ninety six members on our space settlement advisory board. Several of us have been working on ideas that speak to the DARPA request for a financial and organizational model for starship advocacy and development.

Eric Hunting advocates building a space development culture in a specialized community. He details many aspects of the physical and commercial structure of that community. James Blodgett offers a motivational model for starship development that transcends return on investment by finding transcendent expected value in human survival and expansion. Giorgio Gaviraghi proposes a plan for starship advocacy, governance, and public participation.

In discussions for this submission, Joe Miller, Dirk Schulze-Makuch, Stuart Eves, Derek Sears, Bernard Haisch, and Albert Harrison suggested starship technology and mission development methods. (Their bios are available on our website.) The consensus is that a trip to the stars will not be easy, but various approaches seem plausible given sufficient development.

Comments on topics in RFI

- [Long-term survivability over a century-long time horizon](#); - [Self-sustainment, independent of government funding](#):

The StarSeed Foundation will sustain itself via grantsmanship, contracts, sale of publications and branded items, etc. It will rightsize itself to stay well within its income, and therefore should be viable as long as its mission requires. The private organization can be reseeded.

- [Self-governance, independent of government participation or oversight](#):

Both organizations will be independent of government, and beholden only by contractual arrangements for mutual benefit.

- [Relevance to the goal of moving humanity toward the goal of interstellar travel, including related technological, biological, social, economic, and other issues](#):

Both organizations are designed to facilitate solution of these issues.

- [Organizational structure](#); - [Governance mechanism](#):

Both organizations will have the standard President, Board of Directors, etc. However, the best governance is a group of professionals committed to getting the job done, where leaders are followed because they present the best vision. As per Lao Tsu, "When the best leader's work is done the people will say, 'We did it ourselves!'"

- Investment strategy and criteria:

Both organizations will invest excess funds in a well-managed and diversified manner. If legal, StarSeed might invest a portion of funds in relevant startups as an alternative to grants.

- Business model for long-term self-sustainment, as needed to meet the objectives and attributes described above:

See “Long-term survivability” above.

- Methods for inspiring new generations of researchers:

Researchers are excited by rapid progress in transformative technology. Both organizations hope to facilitate progress. StarSeed hopes to fund fellowships for new research students.

- Methods for obtaining initial and sustaining funding:

See “Long-term survivability” above. The private entity hopes to access capital markets at the venture and IPO levels, and to self-finance through retention of profits.

- Branding and messaging for the long term research strategy:

We hope that StarSeed will attain sufficient prestige so that our participation in a project and our prizes carry weight. Prizes and participation convey prestige upon the recipient, but also convey the prestige of the recipient’s accomplishments upon the donor.

- Proposed Handling of Intellectual property of researchers and future products; - Methods to incentivize researchers:

Most continue as they do today, in the organizations in which researchers are employed. StarSeed prizes may provide an additional incentive. The private entity will consider awarding a share of patent rights to the inventor.

- Specific types and domains of future research:

It is not intended that StarSeed employ researchers, but rather that it encourage research, research that will study whatever reveals itself as transformative technology applicable to star travel to the imaginations of creative thinkers. Of special interest is the subject of enhancing and facilitating creativity itself, especially creativity in developing transformative technology. [Our Win Wenger is interested in this.] The private entity will research starship-enabling technology with potential commercial application.

- Approach to an ongoing relationship to government research:

Government researchers, and researchers connected to other institutions, are all part of the technically creative community that we hope to inspire.