

## TYPES OF PUBLIC ENGAGEMENT FOR A MULTI-YEAR MISSION: THE INTERSTELLAR PROBE.

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**Introduction:** How do we engage the public with a 50+ year mission? Scientists face challenges in effectively interacting with the public [1-4], along with the ever-changing nature of such a long-duration mission and updating of results. The Interstellar Probe initiative may benefit from an education and public engagement team for the purpose of professional development for scientists, exploring different tools for engagement, and outreach opportunities for a wide swath of communication.

Some examples of such public engagement can follow the resources and engagement as that from the Lunar and Planetary Institute (LPI), Impact Earth, the Toolbox for Research and Exploration (TREX), and even previous mission initiatives and engagement with the public, such as the Cassini mission [4-7].

This abstract simply outlines the different types of public engagement that the Interstellar Probe could potentially develop and eventually undertake. Specifically, there are 4 main themes to explore: Public, Visual, Audio, and Research. Inclusivity should also be a factor on how to better engage the public through a multi-year mission.

Type of Communication
Podcasting, Audio Archiving
Citizen Science
Public Engagement
Research Tool Library
Videos
Interactive Exploration
Swag (Bookmarks, stickers, etc.)

**Public Engagement:** *Public* engagement can happen in two ways: personal and virtual. With personal engagement, this can be a public lecture, keynote invitation, or a meet-a-scientist event at a school or museum. *Virtual* public engagement includes social media, usually through Twitter, ask-me-anything (AMA), blogs, or lectures with educational classes or extracurricular groups (e.g., astronomy clubs, scout troops). Professional-public engagement could also be a prominent avenue for communication, where engagement with professional outreach groups, such as the NASA Solar System Ambassadors, would be prevalent and accessible for educators.

**Visual Engagement:** Visual engagement consists of several avenues to consider, the three main themes

includes: 1) *swag*; 2) *videos*; 3) *interactive exploration*. Swag can include the fun visual take-home materials, such as stickers, posters, bookmarks, etc. Videos can include educational-specific videos (available freely via *YouTube* or by other educational-specific streaming avenues, such as *Nebula* or *Curiosity Stream*).

Interactive exploration can also be sub-divided by different types of engagement. A popular and still fairly new technology for public engagement is the use of virtual reality (VR). While this has been mainly for martian and lunar surface exploration [8], ISP can benefit from VR through a more extensive look at our solar system and beyond (for example, a VR experience of the flight path, or visual map of the heliosphere/dynamics of our Sun).

Another fairly new technique for visual public engagement is the use of art. For example, the University of Arizona Lunar and Planetary Laboratory (UA-LPL) hosts an annual *Art of Planetary Science* to engage the public in artistic works and visual representations/interpretations of the solar system through different mediums, including the use of publicly-available data [9]! Another example of this is the TREX *Artist in Residency Program* [6], where both scientists and artists collaborate and result in artwork to be displayed in both public spaces (museums, libraries) and scientific meetings. This collaboration works by the scientists giving “prompts” that include themes and data from their research.

**Audio Engagement:** For such a long-term mission as ISP, audio tools can also be a useful avenue of communication, especially for the purpose of archiving through the generations. Audio archiving can certainly be transcripts from the video engagements, but also the use of podcasts can also be a benefit. Podcasting can take on two forms: 1) *interview* engagement; and 2) *update* engagement. For interviews, scientists can communicate with STEM-specific podcast platforms to make other listener-bases aware of what ISP is. For update-type communication, ISP can have a personalized podcast archive to essentially archive different aspects of the mission and the teams involved. This may include interviews with certain team members for a chance to allow them to explain their research for ISP. The podcasts could also document engineering aspects of ISP that may not otherwise have opportunities for public or visual engagement.

**Research Engagement:** The ISP mission is multidisciplinary and can reach a wide swath of upcoming early-career or early-collegiate scientists. The ISP outreach can host research collaborations with the public in two ways: 1) data library; and 2) citizen science. A data library can be a publicly-available database for new or current researchers, whether it is available as part of the Planetary Data System [10], or its own archiving system, similar to TREX [6] or the Arizona State Spectral Library [11]. These “libraries” can be archived in a way that multi-generational researchers could use for their own discoveries.

Citizen science uses a public-centric view on the use of multi-datasets (and also in this case, multi-generational techniques) for the purpose of tackling large amounts of data downlinking and observations. Examples of this type of engagement can be found in SETI@Home and Einstein@Home [12-13].

**Inclusivity:** A major theme that is absolutely necessary for public engagement is inclusivity and the awareness of reaching broader audiences. Outreach to include hearing/seeing impaired or mentally-disabled communities are still lacking in the sciences. There are several opportunities that ISP could take action to be inclusive. For example, TREX hosted an online workshop specifically for disabled writers (physically and mentally). The goals of their workshop intended to promote and support disabled writers interested in space science and to share their voices through different mediums [6]. Other projects that have emerged from the space sciences include adding transcripts to visual engagement [14], and the use of 3D printing for the visually-impaired [15].

**Summary:** ISP in its multi-generational life should take the opportunity to have a dedicated Team/Lead on outreach and public communications to objectively convey data products and science updates on various communicative platforms, and the public attention excited about the overall ISP mission.

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