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ICARUS INTERSTELLAR'S "PROJECT BIFROST" BLUEPRINT FOR USING NUCLEAR SPACE TECHNOLOGIES IN INTERSTELLAR SPACEFLIGHT

Abstract

Icarus Interstellar is a non-profit organization dedicated to designing and launching an interstellar starship by the year 2100, similar to the ambitions of the DARPA 100 Year Starship Study. Categorically, Nuclear Space Technologies (NSTs) would overlap with numerous areas technology critical to enabling interstellar missions, including onboard power systems and secondary propulsion. The use of NSTs is ideal for situations requiring long duration missions isolated from resources (like solar or coal) that are needed to generate power. NSTs create their own power internally and last for a number of decades. A myriad of NSTs exist for Starship use, due to the versatility of nuclear cores. They may be used in a similar fashion to alkaline batteries, in that they can be scaled to size and function differently depending on factors like the coolant used, the method of heat rejection, where they are used, and so forth. Despite the fact that NSTs have already been established in various research facilities, physically created and tested, and have also enjoyed significant stretches of funding throughout history, NSTs are also cursed with particularly strong and expensive government regulations that protect them from being mis-used as weapons of mass destruction. Because of this fact, Icarus will have to be both diligent and intelligent regarding the establishment of its NST program, following existing rules and keeping close to current projects in the United States.

In this talk, we discuss the utility of NSTs for interstellar missions, and also summarize some of the salient government regulations that need to be understood and followed, to ensure compliance. We also introduce to the community the Bifrostkarnan Corporation (Bifrost), a small NST business that performs basic NST and Nuclear Thermal Rocket (NTR) R&D. Bifrost strives to unite the NST community within the United States in order to carry forward the project completion and realization of NST use in space. Bifrost is donating services and expertise to Icarus Interstellar and so a brief summary of Bifrost will be given, with an emphasis on its capacity to coordinate and collaborate with a wide range of space research organizations.