15th IAA SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FUTURE (D4)
Strategies for Rapid Implementation of Interstellar Missions: Precursors and Beyond (4)

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THE BREAKTHROUGH INITIATIVES: A NEW SEARCH FOR LIFE IN THE UNIVERSE. S. PETE WORDEN AND PETE KLUPAR1 BREAK-THROUGH PRIZE FOUNDATION, 3000 SAND HILL ROAD, 4-180, MENLO PARK, CA 94025, USA, PETE@BREAKTHROUGHPRIZE.ORG.

Abstract

Introduction: The Breakthrough Prize Foundation was founded six years ago to celebrate the achievements of the world's most extraordinary scientists. On July 20, 2015 at the Royal Society in London, Yuri Milner and Stephen Hawking announced the Breakthrough Initiatives - founded by Yuri and Julia Milner to explore the Universe, seek scientific evidence of life beyond Earth, and encourage public debate from a planetary perspective. Funded at $100M, these include a Search for Extra Terrestrial Intelligence (SETI) called `Breakthrou$
$ing announced `Breakthrough Star Shot', an initia-tive to develop and launch Earth's first interstellar probe to our nearest sta$
Rapid technological advances have opened up the possibility of light-powered space travel significant fraction of light speed. Involving a ground-based light beamer pushing ultra-light nanocrafts – min-iature space probes attached to lightsails – to speeds of up to 100 million miles an hour. Such a system would allow a flyby mission to reach Alpha Centauri – four and a half light-years away - in just over 20 years from launch, and beam home images of possible planets, as well as other scientific data. Breakthrough Starshot will demonstrate proof of concept for the ultra-fast light-driven nanocrafts, and lay the foundations for a first launch to Alpha Centauri within the next generation. The project will generate important supplementary benefits to as-tronomy, including detection of Earth-crossing as-teroids. A number of hard engineering challenges remain before these missions can become a reality. Break-through StarShot has three phases. The first, $100M phase will proceed during the next number of years to develop the key technologies in laser beamer and lightsail te$
$funded 500$m-$1 billion prototype system designed to propel a nanocraft at an order of magni-tude or more than possible today. Fo$
$private partnership to build system to direct hundreds of nanoprobes to Alpha Centauri system at 20 We will discuss the current c$