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Author: Dr. Ugur Guven
United States

Mr. Seetesh Pande
Individual collaboration, India
Mr. Gurunadh Velidi
University of Petroleum and Energy Studies, India

INTERSTELLAR SPACEFLIGHT USING NUCLEAR PROPULSION AND ADVANCED
TECHNIQUES

Abstract

Our present space technology has just put its first step outside our heliopause. With 2012, Voyager will be the first manmade object to exit our Solar System for the first time. As space technology develops and as the future of humanity demands more and more; the only way that the humanity can expand would be toward the stars. Even though this may seem to be a dream at this point, the continuing trend in the technology suggests that this will be possible in the next century or towards the end of the 21st century. Thus, the modes of transportation for interstellar distances need to be considered now, so that the necessary technology can be developed correspondingly. In terms of specific impulse, conventional methods are totally useless for any distances that are outside our solar system. Thus, more exotic means of space transport conditions need to be realized in order to make interstellar travel a reality. With current technology, using advanced nuclear propulsion techniques seem to be the best way, as they possess the ability to create high specific impulses in a short period of time. Continued acceleration will be a key to success in such an endeavour and more importantly, with advanced nuclear propulsion, it can be possible to meet the necessary power requirements for the mission. In addition, combination of antimatter propulsion as well as fusion propulsion can be combined to give even a higher specific impulse, as well as an ability to meet power demands for decades, which will be necessary for travelling even at those high speeds. This paper will examine the most probable possibilities regarding interstellar travel based upon the available science and technology that we have today. In addition, this paper will treat some advanced but hypothetical forms of interstellar travel by the utilization of space curvature to some extent. In the end, the humanity has nowhere to go but to the stars. In this paper, we will try to demonstrate with calculations, the most probable way of achieving these objectives.