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UTILIZATION OF RESOURCES ON TITAN AND TRANSITORY BASE-CAMP FOR MANNED  
OUTER SOLAR SYSTEM EXPLORATION

**Abstract**

Humanity is slowly progressing towards its goals of interstellar travel and new methods and technologies are being developed constantly so that these dreams can eventually turn to reality. But before we sanction any long distance missions, we must first uncover the secrets of our own solar system. Although it is generally assumed that there is no sentient life in the solar system, Space exploration agencies throughout the world have shown interest in various planetary bodies in our solar system. Their plans include the development of permanent human settlements, research stations and bases for further interstellar exploration and a prime candidate for such a habitat is one of the satellites of Saturn – Titan.

Titan has a plethora of resources which can be utilized for meeting many of humanity's requirements for deep space exploration such as liquid water oceans, ammonia, methane and other nitrogenous compounds. These compounds will prove extremely beneficial for the colonizers and future space explorers. E.g. - Methane and Ethane gases which are abundant on Titan can be used for the production of hydrogen through the steam-methane and steam-ethane reforming process. The produced hydrogen can be used as rocket fuel. The water on Titan present in both solid and liquid forms, can be catalyzed to produce oxygen to support aerobic life forms. Even the atmosphere of Titan is suitable for the development of a human base-camp there. The presence of a thick atmosphere is good for shielding the surface from solar and Galactic cosmic radiation. Overall this technical paper presents the resources utilization on Titan for the future manned mission to Titan and setup of base-camp. This will help us in outer space exploration as well since Titan can be utilized as the transitory base-camp for outer solar system exploration. Calculations for various profitable energy resources will be presented at the conference.