Paper ID: 49566
oral
student

IAF BUSINESS INNOVATION SYMPOSIUM (E6)
Entrepreneurship Around the World (5-GTS.1)

Author: Mr. Georgios Profitiliotis
National Technical University of Athens, Greece

PLANETARY PROTECTION ISSUES OF PRIVATE ENDEAVOURS IN RESEARCH, EXPLORATION, AND HUMAN ACCESS TO SPACE: A PILOT STATED PREFERENCE VALUATION STUDY

Abstract

The emergence of private space actors is pushing the boundaries of the space industry with technological innovations that may soon enable the targeting of the novel market segments of space research and exploration, space resources utilization, and human access to space. To facilitate the invigoration and the forthcoming growth of this new space economy, the interdisciplinary field of Planetary Protection has to keep up with these advances. Planetary Protection is defined as a set of guidelines that aim to prevent the forward contamination of celestial bodies with biological material from Earth and the backward contamination of the terrestrial biosphere with extraterrestrial biological material. As space entrepreneurs acquire and develop the resources and competencies for commercial access to space, significant questions are expected to be raised in the future with respect to potential forward and backward contamination issues. Although such private endeavours do not seem to pose a serious Planetary Protection threat at the moment, certain preparatory steps need to be taken in order to prudently inform the relevant policy-making procedures. This work describes the development and the pilot application of a stated preference study, a useful tool of the environmental economics discipline, with the aim of demonstrating an initial economic valuation of the external benefits of preventing forward and backward contamination. Particularly, via a survey specifically designed for this purpose, a set of questions are used to elicit the perceived economic value that respondents place on the protection of certain extraterrestrial and terrestrial non-excludable goods from forward and backward contamination respectively; the survey is administered to a pilot sample and the generated data is processed through statistical analysis. Since stated preference is currently the only known approach to capture the value of non-market goods, the results of this study represent an estimation of both the use and the non-use values of the surveyed goods. Through the introduction of a widely used environmental economics tool, the goal of this work is to provide useful insights on the expected external benefits of Planetary Protection. A larger-scale application of this tool may generate necessary inputs for the quantitative estimation and equitable distribution of the net social benefits of contamination prevention during commercial activities, thus verifying the important role of Planetary Protection measures as a means to enable future entrepreneurial space endeavours around the world that might otherwise be precautionarily obstructed, due to questioning of corporate legitimacy.