

HUMAN EXPLORATION OF THE SOLAR SYSTEM SYMPOSIUM (A5)
Human Exploration of the Moon and Cislunar Space (1)

Author: Mr. Jerry Stone
United Kingdom

SPACE COLONISATION: A NEW APPROACH - ISLAND ZERO

Abstract

40 years ago, work by Gerard O'Neill led to plans being developed for large-scale space colonies, the first of which became known as "Island One", housing 10,000 people. However the launch capability of the Space Shuttle - both in frequency and costs - fell far below what had been planned, making the project unfeasible. With the development of Skylon, plus improvements in technology in the last 4 decades, construction of such space settlements could be far more effective. The British Interplanetary Society is therefore running a project to re-examine and update the original studies. Obviously it would be impractical to build Island One as an initial structure; such an undertaking would require the establishment of accommodation and workshops for the construction crew, plus facilities to extract material from the Moon, and space processing and manufacturing facilities. However even before that work is begun, it makes sense to establish a much smaller structure first. This project would demonstrate some of the features of a full settlement but on a much smaller scale, both in size and cost. We have designated this as "Island Zero" This would include:

- Living under simulated gravity - something that has never been done in space before Construction from modular units Development of a space manufacturing facility We propose a structure using inflatable modules similar to those launched by Bigelow Aerospace. Set around a central hub, the entire structure would rotate to provide simulated gravity. With 8 main modules, this could provide an internal volume twice that of the International Space Station, yet at considerably lower cost. An initial structure would be established in Low Earth Orbit as a means of gaining experience in constructing such a facility, as well as the experience of living and working in space under simulated gravity. This would offer opportunities not available on the ISS. A subsequent version could have a small asteroid as the hub. NASA's Asteroid Redirect Mission plans to retrieve an 8-10m asteroid and place it into lunar orbit. Using this as a hub for Island Zero would allow the following:
- Far longer-term investigation of an asteroid than the 2 EVA's in the current ARM plans Establishing an initial version of a space manufacturing facility Gaining experience in extracting, separating and processing asteroid material The Island Zero concept therefore provides many benefits that will assist in planning for long-term, large-scale human activities in space.