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"A MICROSOCIETY IN A MINIWORLD": AN ARCHAEOLOGICAL INVESTIGATION INTO CULTURE ON THE INTERNATIONAL SPACE STATION

Abstract

Space archaeology is defined as the study of 'the material culture relevant to space exploration that is found on earth and in outer space (i.e. exoatmospheric material) and that is clearly the result of human behaviour' (Gorman and O'Leary 2013:409). The aims of space archaeology are to investigate material culture assemblages in order to understand the interaction of technology and human behaviour in off-Earth environments. (Space archaeology is not to be confused with the application of satellite remote-sensing data for mapping archaeological sites on Earth).

Crewed spacecraft have long been recognized as "a microsociety in a miniworld," as it was aptly put in the National Academy of Sciences report Human Factors in Long-Duration Spaceflight (Lindsley 1972). With more than 16 years of intensive occupation, and a multi-national, multi-ethnic and -gendered crew, the ISS represents the next phase of human adaptations to space. The ISS is a rich 'natural laboratory' through which to study the most critical infrastructure of the human migration beyond the Earth. To date, habitability studies have focused on the medical, psychological and behavioural responses gathered directly from astronaut experience and monitoring. The 'small things forgotten' (Deetz 1996) which illuminate human behaviour for the archaeologist are, in fact, usually forgotten in these evaluations.

This paper describes an archaeological methodology to identify and analyse how a space culture (including the texts, attire, performance of tasks, associated symbols, decoration, and objects that become codified by repetitive use) has emerged and evolved. Previous archaeological studies of homelessness and migration have demonstrated that the analysis of material culture can reveal new and often surprising results. The data is collected images, audio, video, and text media made available through NASA. The study draws on archaeological theories about the role of material culture in creating communities in isolated environments on Earth, both to understand how these relate to adaptation to a microgravity environment, and to provide insight into how long duration missions can be more effectively designed by national space agencies and commercial spaceflight operators.

As NASA starts developing deep-space habitation prototypes, understanding how the material environment affects human behaviour and how people shape this environment to suit their needs is critical. An archaeological study aimed at illuminating the role of material culture in enclosed microgravity environments has the potential to contribute to the design of such future missions.