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A NEUTRAL BUOYANCY LABORATORY FOR SIMULATING EVA OPERATIONS

Abstract

Extravehicular activities are risky, complex, and expensive operations performed outside the safety of a spacecraft. Such operations require careful rehearsal, teamwork, and communication between those performing the EVA and mission control. EVA preparation and rehearsal in analogous terrestrial environments can help retire risk by allowing teams to rehearse and coordinate EVA operations prior to spaceflight. Such environments may also be used to test and evaluate new space suit designs and technologies, such as the use of robotic aids (i.e. a rover with a camera). Neutral Buoyancy Laboratories are underwater facilities that simulate the weightlessness of the microgravity environment that an EVA team will encounter. In this paper, we introduce the development and deployment of the International Institute for Astronautical Sciences (IIAS) Neutral Buoyancy Lab, including operations conducted to date, and plans for future development.