

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Life Support and EVA Systems (6)

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THE DEVELOPMENT OF A HIGH MOBILITY SPACE SUIT HELMET FOR PLANETARY
EXPLORATION**Abstract**

High mobility space suits will be necessary to maximize the advantages of human exploration of asteroids, the Moon, and Mars. To advance human exploration capabilities, the MIT Man-Vehicle Laboratory is developing the BiosuitTM, a highly mobile extravehicular activity suit. A new helmet design has been developed for the purpose of integrating with the unique features of the BiosuitTM and providing the maximum visual capabilities for the wearer. The BiosuitTM implements mechanical counter pressure rather than gas pressurization to protect the user from vacuum. Helmet design features and engineering analysis address the challenges of linking a gas pressurized helmet to a mechanically pressurized suit. These features include a neck seal, helmet restraint system, and a breathing compensation bladder. Analysis of the effectiveness and mobility of the neck seal and helmet restraint system are discussed. Design features to maximize visual field, helmet customizability, and donning ability are also detailed.