

Aeronautics and Space Engineering Board News



Welcome to the latest installment of the ASEB News! This newsletter will update you on ASEB events and activities, as well as policy items of interest to the aerospace community.

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New Decadal Survey Defines the Renewal of a Life and Physical Sciences Research Program at NASA

On April 4, 2011, the Committee for the Decadal Survey on Biological and Physical Sciences in Space released its report, *Recapturing a Future for Space Exploration: Life and Physical Sciences Research for a New Era*, after nearly two years of study and with the input of close to 70 committee and panel members, 40 reviewers, and 12 staff members. Co-chaired by Elizabeth Cantwell and Wendy Kohrt, the report makes a wide range of programmatic and technical recommendations to re-establish a robust life and physical sciences research program in space.

Introduction

While great strides have been made in human space exploration since the dawn of the space age, further progress will require overcoming substantial scientific and technical challenges. The scientific agenda for meeting these challenges can also have substantial terrestrial benefits. To help set this agenda, Congress in the FY2008 Omnibus Appropriations Act directed NASA to request from the NRC a "decadal survey" of life a physical sciences research in micro-gravity and partial gravity environments. Among other things, this study was to define research areas, recommend a research portfolio and timelines, identify terrestrial benefits, and specify whether the results of the research would directly enable exploration or produce fundamental new knowledge.

Findings and Recommendations

Since its inception, NASA's progress in human

space exploration has depended on its ability to overcome a wide range of biomedical, engineering, and physical science challenges. In the past decade, however, the agency's life and physical science research program has declined substantially, leaving it in a poor position to continue that progress and take advantage of the fully equipped International Space Station (ISS). Nevertheless, a focused science and engineering program can make possible the achievements needed to ensure that the nation is ready for the next significant phase of human spaceflight. This report presents an examination of the science and technology that can bring about these achievements such as a deeper understanding of the role of gravity in the regulation of biological systems, production of large amounts of water from extraterrestrial sources, and research on fire safety and regenerative fuel cells. The assessment has two foci: research that *enables* space exploration and research that is *enabled by* access to space.

Programmatic Issues—Currently, life and physical science research has no clear institutional home at

A copy of the decadal survey can be purchased, or downloaded as a PDF document for free, from <http://www.nap.edu/catalog.php?record_id=13048>.

NASA. Successful renewal of such research requires high-level, strong leadership that facilitates the necessary research and integration with the mission activities. Life and physical science research should be central to

NASA's space exploration mission and integral to spaceflight operations. In addition, a renewed stable funding base for this research is essential, and the budget must be sufficient, sustained, and appropri-

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