HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Utilization & Exploitation of Human Spaceflight Systems (3)

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THE INTERNATIONAL SPACE STATION AT 15 YEARS: RESEARCH IN SPACE FOR THE BENEFIT OF ALL HUMANITY

Abstract

During 2013, the International Space Station celebrated 15 years since the launch of its first element. Since that time, the ISS has proven to be a unique and capable laboratory in space, where science operations continue for 24 hours a day, seven days a week. More than 1500 investigations have been conducted on ISS, with more than 900 scientific publications since the 1998 launch of the first ISS Module, and over 80- countries have participated in these research and education endeavors. There continues to be cutting edge research performed on the ISS in fields of human physiology, biology (of cells plants and organisms), physical sciences (including materials science, fluid physics, combustion, and fundamental physics), astrophysics, Earth science, and technology development. Investigations continue in the study of the changes in vision experienced by crewmembers on board the ISS for long-duration stays, and there have been some new insights into the causes of this phenomenon. Scientists continue to study physical

science phenomena such as liquid and solid interfaces and materials self-assembly. As hyperspectral data access is opened to the international scientific community, new Earth science instruments are being added in 2014 to better predict hurricane intensification and model global climate. Concepts for human spaceflight activities beyond low earth orbit are being tested with investigations that provide compact life support and use robotic support, e.g. remotely controlling exploration robots while exploring places such as Mars, asteroids, or other celestial bodies. These are some examples of the many current research operations in work on ISS.

The ISS is now in its third year of full utilization, and there continues to be an increase in the scientific and educational opportunities and achievements on board. Increased international collaboration is driving not only increases in science results, but also in the development of applications that benefit humanity ranging from the development of robots to perform precise surgeries, to advances in providing potable water to people living in remote areas, to new materials that are lighter and more durable, to providing a bird's eye view in real-time of disastrous events to provide information to aid response teams.