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

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REFLECTIONS ON 20 YEARS OF RESEARCH ON THE INTERNATIONAL SPACE STATION

Abstract

November 2, 2000 began an era of continuous human presence on the International Space Station (ISS). That first crewed expedition to the ISS had few scientific instruments and facilities to work with, yet managed to conduct 34 research investigations. Today, crew oversee upwards of 300 investigations during their time onboard. Indeed, over the past 20 years the ISS has evolved into a robust laboratory with dozens of research facilities, capabilities for the autonomous monitoring and conduct of research, and an ever growing array of scientific tools and observational instruments available. As a result, the station has hosted more than 2,800 research investigations generating more than 2,400 scientific publications across every major discipline of science. The ISS Program Science Forum is composed of senior science

representatives across the station's international partnership. It provides multilateral science leadership to the ISS Program. Indeed, ISS research has evolved to become a truly international activity encompassing the participation of more than 4,000 investigators from over 100 countries whose research has been conducted or is ongoing. This paper provides an overview of the research and technology development conducted to date and reflects upon the accomplishments, impacts and future direction of ISS research from the perspective of the member organizations of the Program Science Forum. Research areas which have been a focus of ISS research to date, and key implications both for future space exploration and scientific advancement are presented. Major Earth benefits derived from ISS research are discussed. Finally, the paper provides insight into areas of emphasis for future research including the maturation of technological capabilities needed for deep space exploration, including lunar exploration programs such as Artemis and future missions to Mars.