

HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)

Human Space Endeavour - Overview (1)

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REALIZING THE BENEFITS OF THE INTERNATIONAL SPACE STATION

Abstract

In the last 50 years, space travel has revolutionized the way humans communicate, view the Earth, and understand their place in the universe. The International Space Station is just beginning to prove its value as the latest platform in this long lineage. Even as astronauts living and working onboard are developing new and better techniques in crew health and technology development to enable human exploration beyond low Earth orbit, the ISS is serving as a test bed for basic research with applications on Earth. As part of its research program, NASA is conducting experiments to evaluate human physiological reactions to long-duration spaceflight, including immune and nervous system responses. NASA is using the station as a true laboratory for the development and test of systems that will be required for human trips to the Moon, Mars, and elsewhere in the solar system. NASA is also using the ISS as a way to develop new operational concepts for human activities in space. While real-time ground control works well for station ops, a direct link to the ground is not feasible for longer trips; the ISS offers a safe place to test out the self-sufficiency that future crews will require. The United States has also declared its segment of the ISS to be a “national laboratory,” which makes station resources available to other interested parties in the academic, governmental, and private sectors. The National Lab initiative, still in its pathfinder phase, is already showing dividends in biological and technological research; recently an experiment involving the salmonella bacteria flown on ISS has shown promise for the development of vaccines against bacterial pathogens. Additional research partnerships are planned that involve Earth environment monitoring and advanced energy technologies. Finally, with the addition of the Columbus and Kibo laboratories, the international research program is becoming increasingly active. The transition to a permanent crew of six makes available the time and resources for more basic and applied research than has previously been possible. This research will yield results, both expected and unexpected, that will improve the capability of humans to travel in space, as well as the capability of humans to improve our own lives on the ground. The potential of the International Space Station is only beginning to be realized. ISS will benefit space flight as well as life on earth.