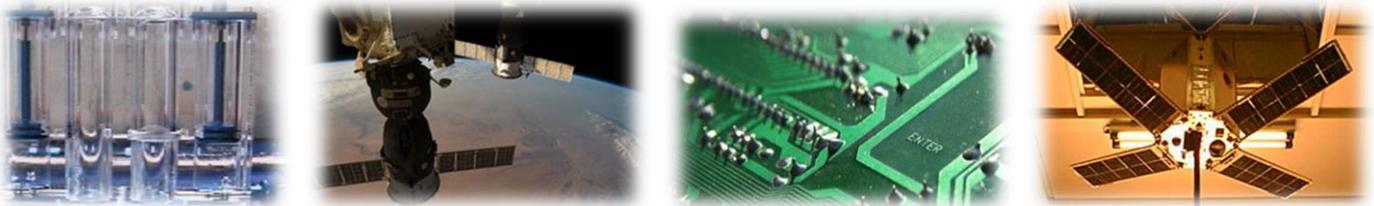


Business Fact Sheet: How Space Benefits Business

A competitive edge for product development and research advancement

The International Space Station U.S. National Laboratory supports research in both the external and internal environments of the station, with virtually uninterrupted worldwide data and communication capabilities. The National Lab environment offers a new paradigm for attacking scientific research, application development, technological demonstration and industrial growth—R&D that can be difficult or even impossible to achieve here on Earth. With more than 25 years of experience and data at its disposal, CASIS will help organizations make full use of this unparalleled research environment.



A powerful opportunity to maximize throughput from R&D to market applications

Space exploration missions quickly revealed that microgravity, or weightlessness, had profound effects on physical and biological phenomena that could advance our knowledge of Earth-based processes, including insights into fundamental and applied scientific investigations. CASIS is working with academics and disease-specific institutes to prove the compelling benefits of space-based research.

The opportunities that the space environment offers will greatly benefit a wide variety of sectors, including pharmaceuticals, biotechnology, energy, nanotechnology, materials science, aerospace and IT. Specific areas of focus include nanomaterials, analytical devices, tissue engineering, biology, drug discovery, agriculture, Earth observation, atmospheric research, energy source generation, propulsion, LED technology, physical sciences, electronics and sensor development.

The unique features of space science

Microgravity Weightlessness alters phenomena in the physical and life sciences, yielding new advantages to basic and applied research. Some systems and processes that microgravity affects include heat transfer, multiphase system dynamics, solidification and combustion. Moreover, microgravity induces a vast array of changes in organisms ranging from bacteria to humans, including alterations in gene expression and cell architecture.

Extreme conditions Extreme heat and cold cycling, ultravacuum, atomic oxygen and high-energy radiation are some of the extreme conditions that occur in space. Testing and qualification of materials exposed simultaneously to these conditions provide data to enable the manufacturing of long-life, reliable components used on Earth.

Low Earth orbit environment The International Space Station has an impressive vantage point. With an approximate altitude of 220 mi (400 km) and an orbital path over 90% of Earth's population, the station offers improved spatial resolution and variable lighting conditions compared with those of the sun-synchronous orbits of typical Earth remote-sensing satellites, allowing insight into diverse fields, from atmospheric modeling to agriculture.

To learn more, contact Ken Shields at kshields@casis-iss.org.