International Space Station
Benefits for Humanity

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Spacecraft Mass: 799,046 lb (362,441 kg)
Velocity: 17,500 mph (28,200 km/h)
Altitude: ~220 miles above Earth (400 km)
Power: 80 kW continuous
Science Capability: Laboratories built by US, Europe, Japan, and Russia
Extended through at least 2024
Developing and testing technologies and operations for Future Exploration beyond Earth Orbit
Research Discoveries and Benefits to Life on Earth
Developing a sustainable commercial market in Low Earth Orbit
International partnership structure extendable to future human exploration endeavors
Global Exploration Roadmap

International Space Station
General Research and Exploration
Preparatory Activities

Note: ISS partner agencies have agreed to use the ISS until at least 2020.

Robotic Missions to Discover and Prepare

- 2013
  - LADEE
  - Rosetta
- 2020
  - Luna-25
  - Luna-26
  - Luna-27
  - RESOLVE
  - SELENE-2
  - Apophis
  - Hayabusa2
  - OSIRIS-REx
  - ExoMars
  - InSight
- 2030
  - SELENE-3
  - Mars 2020
  - ISRO Mars

Mars Sample Return and Precursor Opportunities

Human Missions Beyond Low-Earth Orbit
Explore Near-Earth Asteroid
Extended Duration Crew Missions
Humans to Lunar Surface

Missions to Deep Space and Mars System
Sustainable Human Missions to Mars Surface
What kind of benefits come from research in space?

- Discovery
- Earth Benefits
- Space Exploration
- Research Benefits
- Spinoffs
Major types of benefits on Earth

Health

Earth Observation & Disaster Response

Education

Everyday Technologies
A New Method to Deliver Cancer Treatments

Source: ISS Chief Scientist, NASA
Candidate Treatment for Duchenne’s Muscular Dystrophy from Protein Crystallization

Earth

Space

H₂O

Source: ISS Chief Scientist, NASA
Getting scientific Results from “Bench to Bedside”
Robotically Assisted Brain Surgery

Source: ISS Chief Scientist, NASA
Telemedicine Advancements

Images courtesy of Scott A. Dulchavsky, Henry Ford Health System, Detroit, MI

Source: ISS Chief Scientist, NASA
Water recycling technologies
Disaster Response Networks

Sarychev Peak, Kuril Islands, ISS020-E-9048, 12 June 2009
Water Quality Monitoring

Pensacola Bay January 16, 2012

Chlorophyll a

- 0.3 - 5.0 (μg/L)
- 5.1 - 10.0
- 10.1 - 15.0
- 15.1 - 20.0
- 20.1 - 40.0

World Imagery
Inspiring the Next Generation

International Space Station
Education Opportunities and Accomplishments
2000-2012

5 ISS Partners

44 Countries

25,000 Schools

2,800,000 Teachers

43,100,000 Students

1,700,000 Students in inquiry-based learning

Published on ISS Benefits for Humanity website


(direct link to document:)
http://www.nasa.gov/pdf/696998main_ISS%20Education_Publication%202012_%20final_100512.pdf
Over 80 Countries have participated in research or education on the space station.
The future to 2024 (and beyond)…

- More research
- More international partnerships
- Ever increasing benefits to the world
- Successful future human exploration of space
ISS benefits for Humanity

ISS Research & Technology (link)
http://www.nasa.gov/iss-science/

@ISS_Research (link)

ISS Research Blog “A Lab Aloft” (link)
http://blogs.nasa.gov/ISS_Science_Blog/

See the ISS over Your Town (link)
http://spaceflight.nasa.gov/realdataldata/sightings/