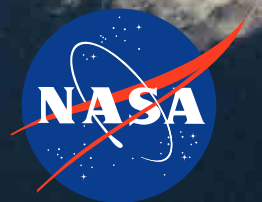
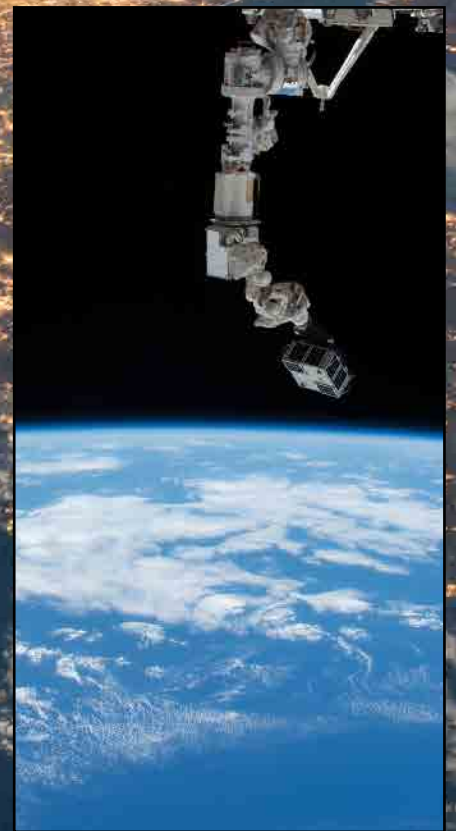
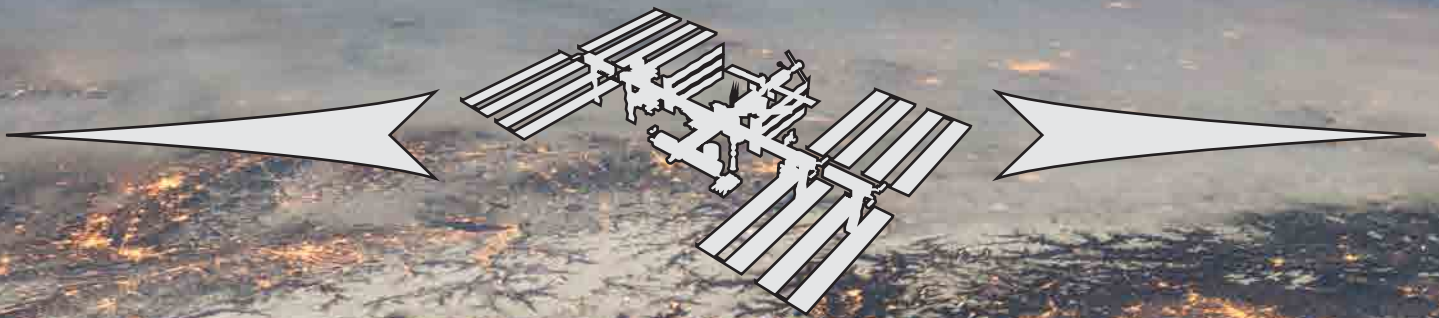


International Space Station

Utilization Statistics

Expeditions 0 – 46

December 1998 – March 2016



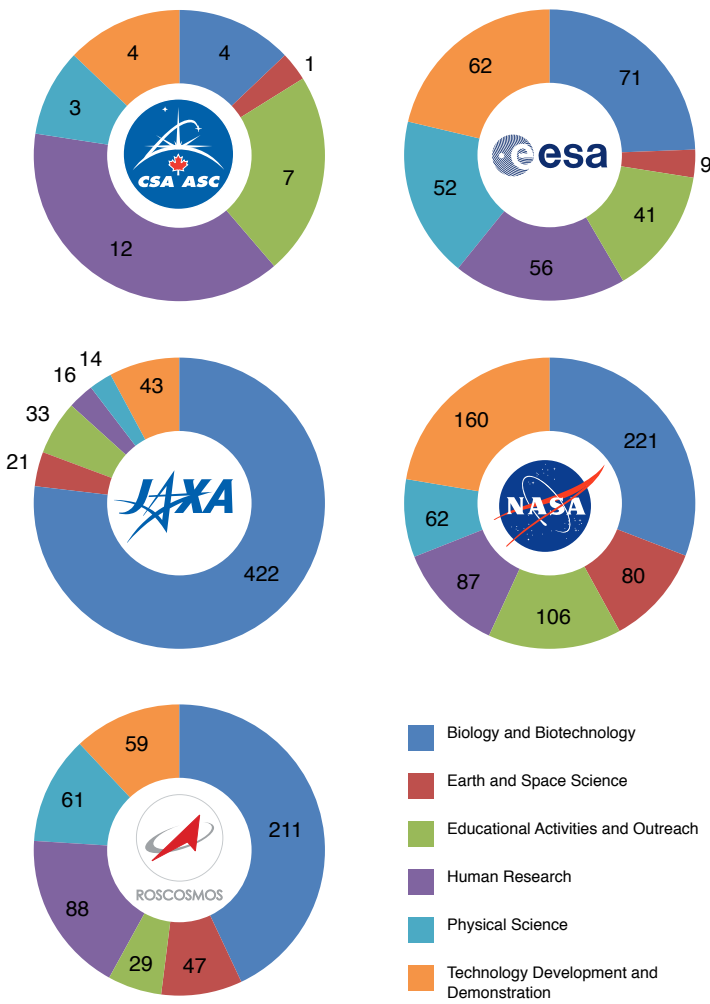
NUMBER OF INVESTIGATIONS PERFORMED ON THE INTERNATIONAL SPACE STATION

The information below provides an overview of ISS utilization up to the end of March 2016. An Expedition pair reflects the 6-month period used by the ISS Program for planning and execution of its activities. The utilization reflects activities of all of the ISS International Partners: CSA, ESA, JAXA, NASA, and Roscosmos. An investigation is defined as a set of activities and measurements (observations) designed to test a scientific hypothesis, related set of hypotheses, or set of technology validation objectives. Investigators include the principle investigator(s) and co-investigator(s) that are working to achieve the objective of the investigation.

	ISS Expeditions 43/44 March 2015 – Sep 2015	ISS Expeditions 45/46 Sep 2015 – March 2016	ISS Expeditions 0-46 Dec 1998 – March 2016
Total Investigations	342	260	2082
New Investigations	121	38	-
Completed/Permanent Investigations	75	20	1498
Number of Investigators with Research on the ISS	928	748	3028
Countries/Areas with ISS Investigations	31	42	95

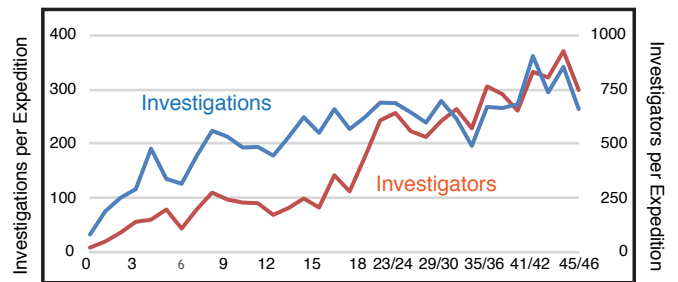
Expeditions 0 – 46 December 1998 – March 2016

Research Disciplines of International Space Station Investigations by Partner Agencies



NASA utilization includes investigations by the Italian Space Agency (ASI), an ISS Participant Agency.

Number of Investigations and Investigators with Research on the ISS per Expedition



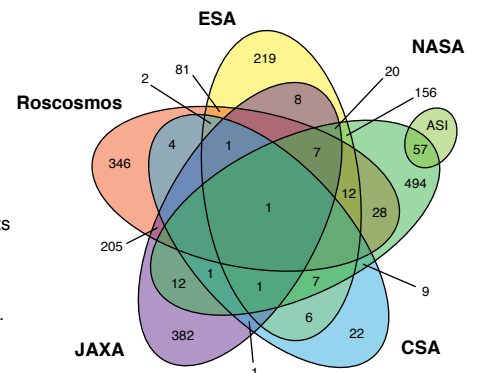
ISS Benefits Increased Through International Collaboration

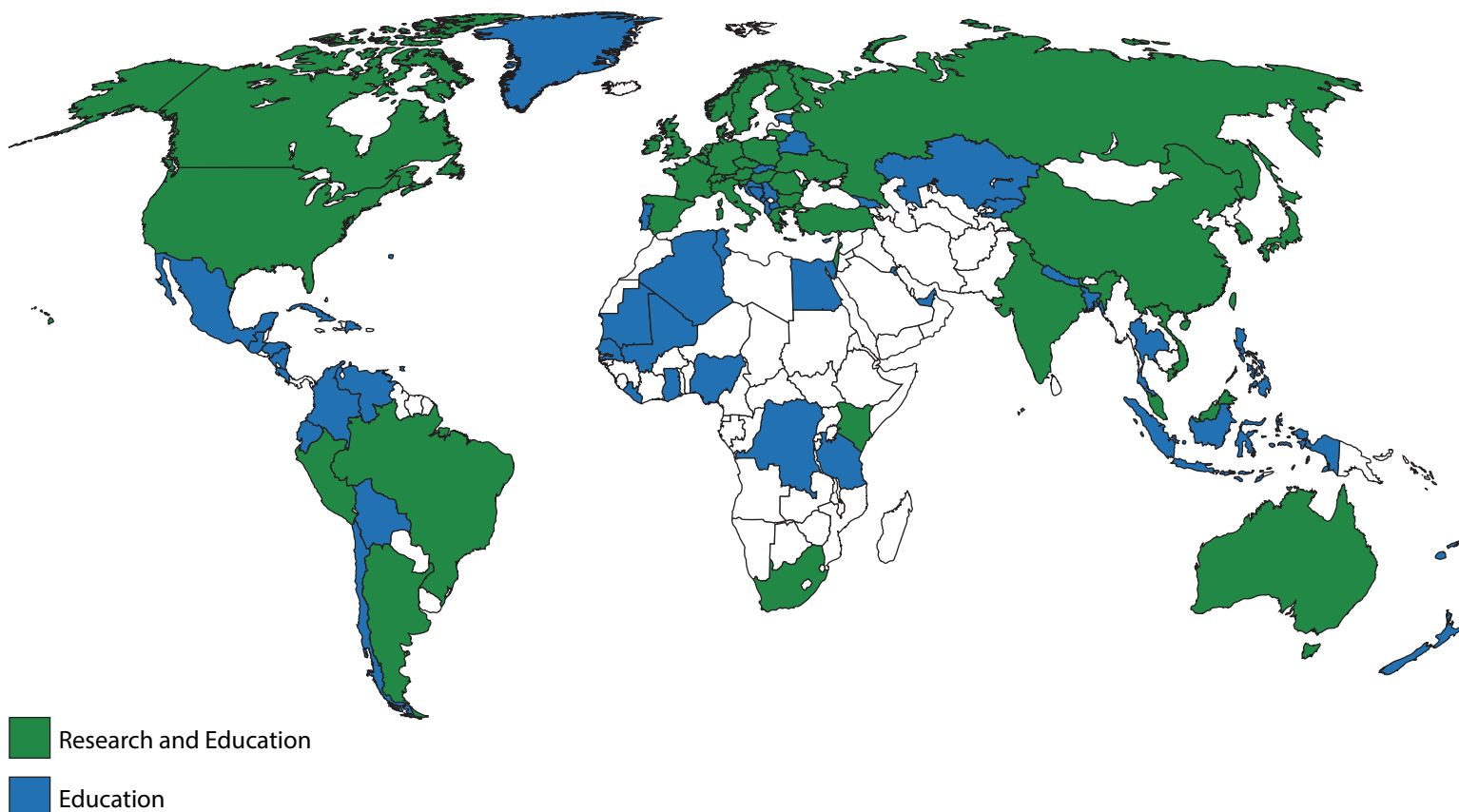
	Agency Only	Collaboration (Hosting)	Investigations Implemented	Collaboration (Participating)	Total Agency Impact
CSA	22	9	31	24	55
ESA	219	72	291	230	521
JAXA	382	167	549	90	639
NASA*	551	165	716	89	805
Roscosmos	346	149	495	192	687
			2082		

*NASA utilization includes investigations by the Italian Space Agency (ASI), an ISS Participant Agency

International collaboration investigations are sponsored by one of the ISS Partners and include scientists from other countries.

Ellipses show the intersection of Partner collaborations and counts show the increased number of investigations through international collaboration from the point of view of each Partner.





95 highlighted countries and areas have participated in ISS Research and Education Activities

Resources for the ISS are often described as upmass (mass of material brought to the ISS), downmass (mass of material returned from ISS) and crewtime (amount of time crew dedicates to an activity).

<i>Research Resources</i>	ISS Expeditions 43/44 March 2015 — Sep 2015	ISS Expeditions 45/46 Sep 2015 — March 2016	ISS Expeditions 0-46 Dec 1998 — March 2016
Upmass	960 kg	933 kg	56837 kg
Downmass	605 kg	41 kg	14983 kg
Crew Time	1933 hrs	1843 hrs	30460 hrs

The investigations statistics represented below reflect research planned for Expeditions 47/48 and 49/50. The numbers of investigations actually performed can only be reported after completion of the expeditions.

<i>Number of Current and Future Investigations on the International Space Station</i>	ISS Expeditions 47/48* March 2016 — Sep 2016	ISS Expeditions 49/50* Sep 2016 — March 2017	ISS Expeditions 47-50 March 2016 — March 2017
Total Investigations	305	276	386
New Investigations	92	88	180
Number of Investigators with Research on the ISS	787	770	962
Countries/Areas with ISS Investigations	27	27	28

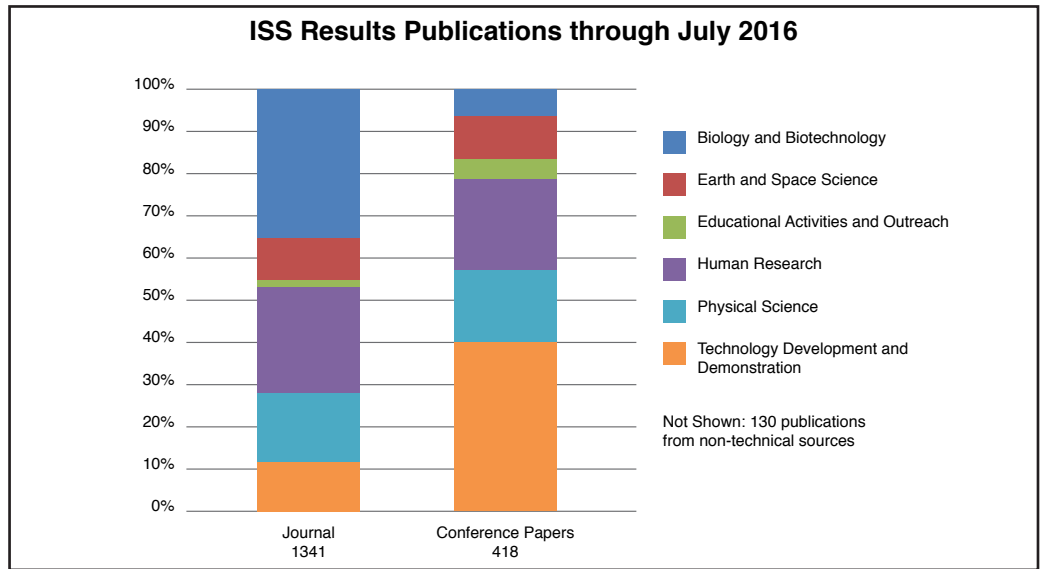
*Roscosmos data is preliminary

International Space Station Publications Data

Top 20 Journals with ISS Results* (Number of Publications)
PLOS ONE (36)
Nature (1)
Proceedings of the National Academy of Sciences of the United States of America (3)
Science (3)
Physical Review Letters (23)
Journal of Biological Chemistry (2)
Chemical Communications (1)
Journal of Neuroscience (1)
Advanced Materials (1)
Journal of Geophysical Research (5)
Optics Express (2)‡
Scientific Reports (6)‡
Chemistry - A European Journal (1)
Geophysical Research Letters (1)
NeuroImage (1)
Journal of Chemical Physics (4)
Langmuir (2)
The Astrophysical Journal (1)
RSC Advances (1)‡
Journal of Physical Chemistry B (2)

*Journals are listed in Eigenfactor® order. Eigenfactor® is an estimate of the percentage of time users spend with a journal, with citations from influential journals ranked higher.

‡ Denotes a new Journal to the top 20 list since the Expedition 0-44 report.



International Space Station News

Important Milestones for 2016:

- Astronaut Scott Kelly and Cosmonaut Mikhail Kornienko completed their one year journey aboard the ISS in March. As they adjust to life back on Earth, they will continue to participate in studies that examine the effects of long-duration spaceflight on the human body. These studies will be the stepping stone for future exploration missions.

Research News:

- ISS Ham Radio (Amateur Radio on the SS – ARISS) had their 1000th successful contact in March 2016 with students from the University of North Dakota speaking with ISS crewmember Tim Kopra. These contacts have introduced students from around the world to space flight and amateur radio.
- The 1 Year Mission has brought together researchers from around the world, working together to determine how spaceflight will affect the body. Roscosmos and NASA are collaborating on multiple experiments to evaluate how the human body responds to long-duration space flight.
- Two new human research investigations from CSA are underway. Marrow(Bone Marrow Adipose Reaction: Red Or White?) looks at the effect of microgravity on the bone marrow to see if microgravity has an effect on blood cell production. Cardiac and Vessel Structure and Function with Long-Duration Space Flight and Recovery (Vascular Echo) examines changes in blood vessels, and the heart, while the crew members are in space, and then follow their recovery on return to Earth.
- Recently, the ESA EXPOSE-R2 series of investigations completed 18 months of direct exposure to the space environment. These four international astrobiology experiments addressed organic molecular photochemistry under solar ultraviolet light, microbial resistance in biofilms, and changes in occurring in biological pigments under actual space conditions. Data from these experiments will help in understanding the chemical processes which lead to the origin of life, the environmental limits to life within the solar system and the biomarkers which can be used to identify signs of past and present life.
- JAXA's external ExHAM platform contains several investigations that will determine how the space environment affects different materials. One of these investigations, Space Environmental Testing of Lightweight and High-Precision Carbon Composite Mirrors (ExHAM-CFRP Mirror), will evaluate the degradation to carbon fiber reinforced plastics. These plastics are used in spacecraft antennas and telescope reflector material; this study could help improve material quality in future spacecraft design.
- BEAM (Bigelow Expandable Activity Module), an experimental expandable capsule was deployed in May 2016. This module serves as a technology demonstration to determine how different aspects of the space environment influence on the materials.

This is a product of the ISS Program Science Forum comprised of representatives from the ISS Partner Agencies: Canadian Space Agency (CSA), European Space Agency (ESA), Japan Aerospace Exploration Agency (JAXA), National Aeronautics and Space Administration (NASA) and the Federal Russian Space Agency (Roscosmos) and the ISS Participant Agency: Italian Space Agency (ASI).

Additional Resources:
 ISS Research and Technology on the Web:
<http://www.nasa.gov/iss-science/>
 Follow us on Twitter: @ISS_Research