

# International Space Station Utilization Statistics Expeditions 0-38 December 1998 – March 2014



## Number of Investigations Performed on the International Space Station

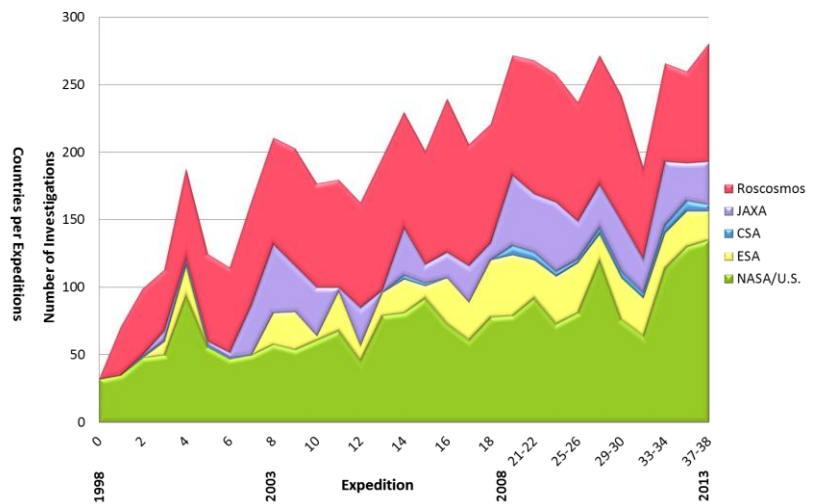
The information below provides an overview of ISS utilization up to the end of **March 2014**. An Expedition pair reflects the 6-month period used by the ISS Program for planning and execution of its activities. The utilization reflects activities of all of the ISS International Partners: CSA, ESA, JAXA, 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 35/36 Mar. 2013 – Sept. 2013	ISS Expeditions 37/38 Sept. 2013 – Mar. 2014	ISS Expeditions 0-38 Dec. 1998 – Mar. 2014
<b>Number of Investigations</b>	260	281	1651
<b>New Investigations</b>	40	52	-
<b>Completed/Permanent Investigations</b>	42	15	1130
<b>Number of Investigators with Research on the ISS</b>	673	640	2307
<b>Countries/Areas with ISS Investigations</b>	49	45	83

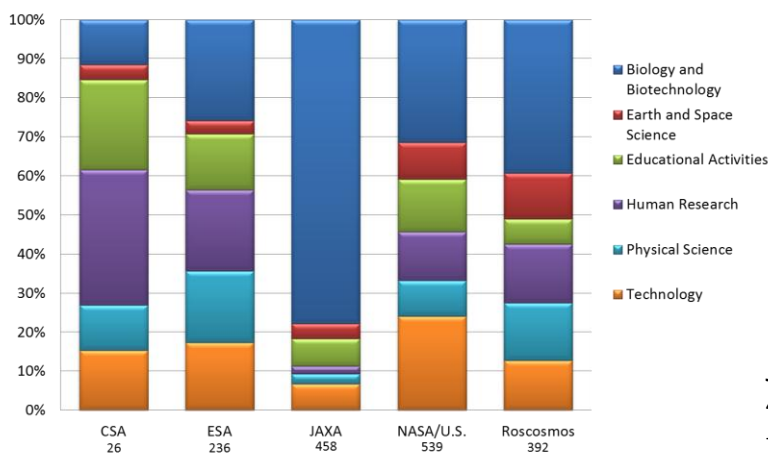
**Number of Investigators with Research on the ISS and Countries per Expedition**  
December 1998 - March 2014



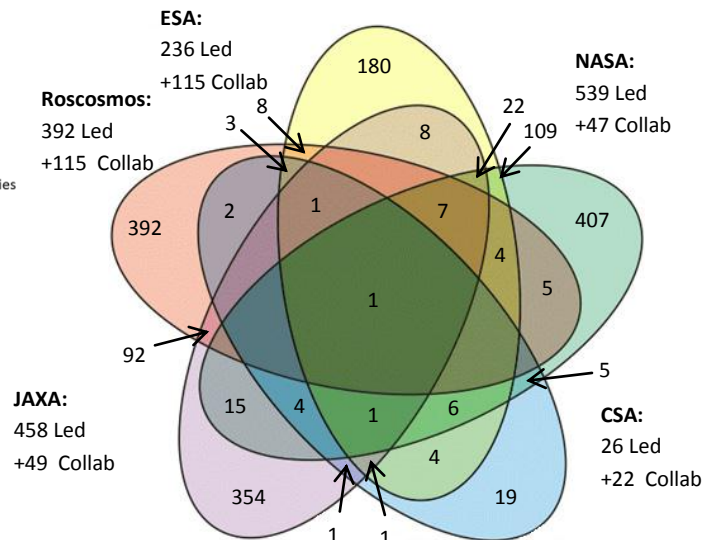
**Research and Technology Investigations per Expedition**  
December 1998 - March 2014



**Research Discipline of ISS Investigations By Partner Agency:**  
Expeditions 0-38  
December 1998 - March 2014

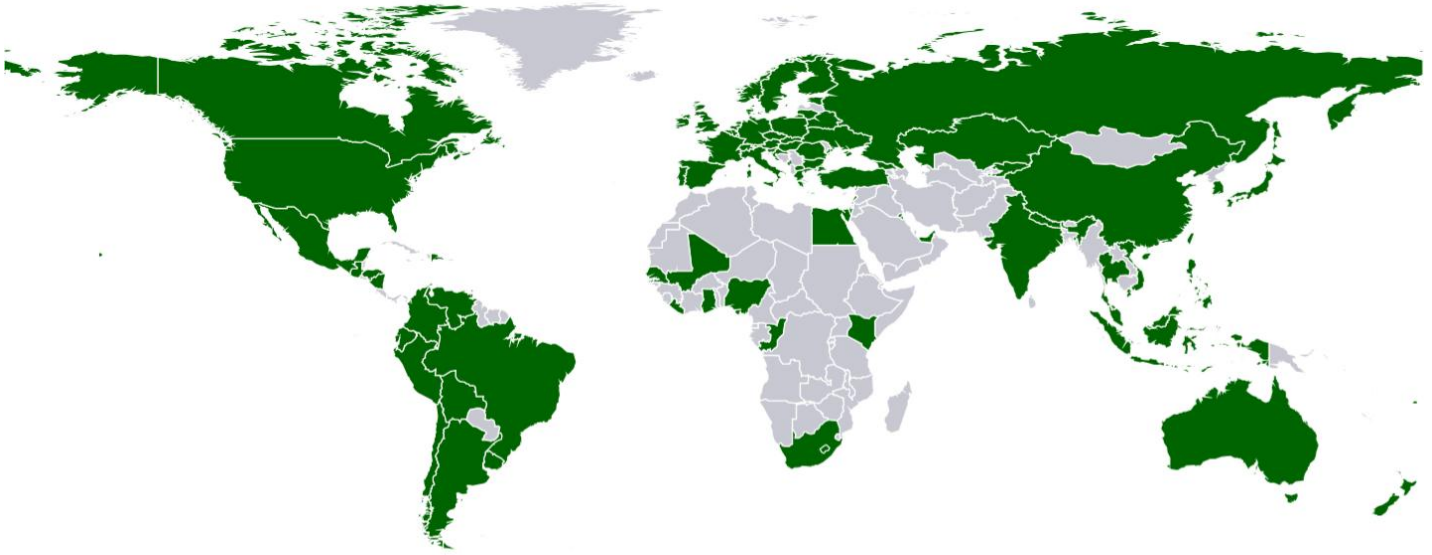


**ISS Benefits Increased Through International Collaboration**  
Expeditions 0-38  
December 1998 – March 2014



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.



*83 highlighted countries and areas have participated in ISS Research and Education Activities.*

### **Research Resources**

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).

<b>Research Resources</b>	<b>ISS Expeditions 35/36 Mar. 2013 – Sept. 2013</b>	<b>ISS Expeditions 37/38 Sept. 2013 – Mar. 2014</b>	<b>ISS Expeditions 0-38 Dec. 1998 – Mar. 2014</b>
<b>Upmass</b>	1,026.5 kg	739.5 kg	50,601.3 kg
<b>Downmass</b>	623.3 kg	37.9 kg	11,981.2 kg
<b>Crew time</b>	1,533.6 hrs	1,710.5 hrs	22,867.3 hrs

### **Number of Current and Future Investigations on the International Space Station**

The investigations statistics represented below reflect research planned for Expeditions 39/40 and 41/42. The numbers of investigations actually performed can only be reported after completion of the expeditions.

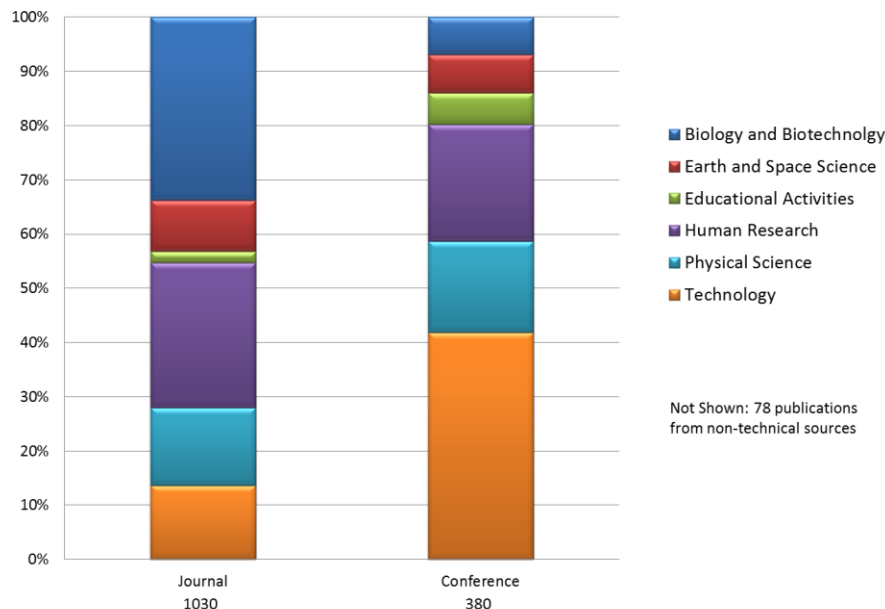
	<b>ISS Expeditions 39/40 Mar. 2014 – Sept. 2014</b>	<b>ISS Expeditions 41/42 Sept. 2014 – Mar. 2015</b>	<b>ISS Expeditions 39-42 Mar. 2014 – Mar. 2015</b>
<b>Total Investigations</b>	338	248	423
<b>New Investigations</b>	89	90	179
<b>Number of Investigators with Research on the ISS</b>	382	432	544
<b>Countries/Areas with ISS Investigations</b>	29	28	29

## ISS Results Publications through July 2014

Top 20 Journals with ISS Results*	
1.	Nature
2.	Proceedings of the National Academy of Sciences of the United States of America
3.	Science
4.	Physical Review Letters
5.	PLOS ONE
6.	Journal of Biological Chemistry
7.	Journal of Neuroscience
8.	Journal of Geophysical Research
9.	Physical Review D <sup>+</sup>
10.	Advanced Materials
11.	Optics Express <sup>+</sup>
12.	Geophysical Research Letters
13.	Journal of Chemical Physics
14.	Langmuir
15.	British Journal of Sports Medicine <sup>+</sup>
16.	Physical Review E
17.	Journal of Physical Chemistry B
18.	NeuroImage
19.	The Astrophysical Journal <sup>+</sup>
20.	Oncogene

\*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 new Journal to top 20 List since the Expeditions 0-36 report.



### International Space Station Benefits for Humanity 2014:

- The ISS is an Earth Observations platform providing researchers and disaster response teams imagery collected from an assortment of instruments from handheld equipment to Hyperspectral imaging to High-Definition cameras.
- The NASA published *Inspiring the Next Generation: International Space Station Education Opportunities and Accomplishments, 2000-2012*, showcases the educational activities associated with the ISS.
- Technology developed to study the effects of microgravity on the human body is also used for “dry immersion” treatment aiding in the relaxation of muscles, increases in immunity, elimination of edema and normalization of blood pressure.
- Astronauts’ adaptation to motion in weightlessness helps researchers develop rehabilitation strategies for patients with brain injuries and neurological disorders.
- Dusty plasma - mixture of small particles in plasma’s charged gases - ISS research has shown potential benefits in disinfecting wounds, neutralizing bacteria and improved wound healing time.
- Study of T-cells – white blood cells that are key elements of the body’s immune system and response to infection and disease – allow scientists to better understand effects of HIV, rheumatoid arthritis and aging.
- Recent discoveries on the ISS in the area of combustion will help with the development of new technology to reduce pollution and increase gas mileage in internal combustion engines.
- Global transmission services mounted on the ISS transmit Coordinated Universal Time (UTC) that can be picked up by a variety of electronics several times per day. This service could be used to locate stolen items such as cars, credit cards.
- Newly developed mWater application, based on ISS technology, for smart devices provides access to a global water quality database that houses and shares information about water sources from around the world.
- Continued studies of colloids behavior in pulsed magnetic fields will lead to improved braking and suspension systems, and shows promise for new nanomaterials for thermal barriers, energy harvesting and color displays.
- Technology demonstrations on ISS are proving that today’s robotic technology can eventually repair, refuel and recover disabled satellites in geosynchronous Earth orbit.

This is a product of the ISS Program Science Forum comprised of representatives from the 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).

Additional Resources:  
 ISS Research and Technology on the Web:  
<http://www.nasa.gov/iss-science/>  
 Follow us on Twitter: [@ISS\\_Research](https://twitter.com/ISS_Research)