International Research Results and Accomplishments From the International Space Station

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Publication by the ISS Program Science Forum:
How Do We Show the Impacts of ISS Utilization?

Scientific Discovery

Benefits for Humanity

Enabling Future Exploration
Ways We Communicate the Impacts of ISS Utilization

- Blogs
- Stories
- Multi-Media
- Social Media
- Media Briefings
- Scientific Presentations
The ISS Program Science Forum has published the first-ever compilation of international ISS Results for investigations published through the year 2011.
Tracking Results from ISS Utilization

- A team of professionals in NASA’s ISS Program Science Office mine for publications from ISS research and technology development through many ways, including:
  - keyword searches with various tools and search engines
  - databases such as AIAA, IEEE, IngentaConnect, JSTOR, J-STAGE, ScienceDirect, Wiley
  - Web of Science
  - conference proceedings
  - science networks such as ResearchGate
  - email alerts from systems such as Pubmed, Google Scholar, Nature Partner Journal-Microgravity
  - NASA Taskbook, and others
  - ISS investigator and international partner websites
  - personal email exchanges with ISS investigators and international partners
ISS Science Research Accomplishments: 2000-2011

A the time of publication, over 1200 journal publications, 59 patents and over 400 conference proceedings were collected from ISS research.
How Do We Show How ISS Knowledge Impacts Science?


- **Roscosmos** scientists published in *PLoS One* that long-duration data has led to new tools for immunological testing in space and in remote and resource-restricted areas on Earth [*Pastushkova et al. 2013*].

- **CSA** scientists from the CCISS investigation published in the *Journal of Applied Physiology* that the current countermeasures on ISS are sufficient to maintain cardiovascular health, and can provide insight into cardiovascular maintenance on Earth [*Hughson et al. 2012*].

- **JAXA** investigators published MAXI observations in *Nature* of a “first-ever”: the instant that a massive black hole swallowed a star, which had before been only a theory [*Burrows et al. 2011*].

- The global team of scientists in the **NASA**-sponsored AMS-02 investigation challenged theoretical models of cosmic predications for evidence of elusive dark matter in *Physical Review Letters*, as the instrument was the first to sift through galactic cosmic rays in energy ranges beyond 200Gev [*Aguilar-Benitez et al. 2014*].

- One of the earliest ISS investigations was also highly collaborative: the ICE-First investigation included investigators from **France**, **Canada**, **Japan**, and the **United States** to study the effects of the spaceflight environment on living systems, using the *Caenorhabditis elegans* as the model organism of study radiobiology, muscle protein changes, ageing, radiation effects on living organisms, apoptosis, and DNA damage and repair.
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<th>Top 20 Journals with ISS Results (Number of Publications)</th>
<th>Times Cited</th>
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<td>PLOS ONE (36)</td>
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<td>Langmuir (2)</td>
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<td>The Astrophysical Journal (1)</td>
<td>9</td>
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How Do We Show How ISS Knowledge Impacts Science?

**Percentage of ISS publications in Top 20 Journals- By Discipline**

By Eigenfactor, which is the rating of the total importance of a scientific journal.
The Future:
How Do We Show How ISS Knowledge Impacts Science?

The University of California San Diego (UCSD) Map Of Science
http://sci.cns.iu.edu/ucsdmap/

Figure: Broner et al. 2012. *PLoS One* July 7(7):e39464

National Academies of Science “AcademyScope”
https://www.nap.edu/academy-scope
NASA ISS Research & Technology Resources

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

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ISS Research Blog “A Lab Aloft”
http://go.usa.gov/atI

ISS Research Explorer App
(Apple App Store and Google Play)

Benefits: www.nasa.gov/stationbenefits