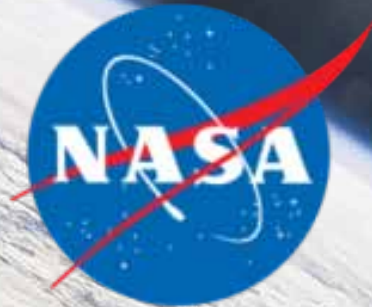


International Space Station NASA Research



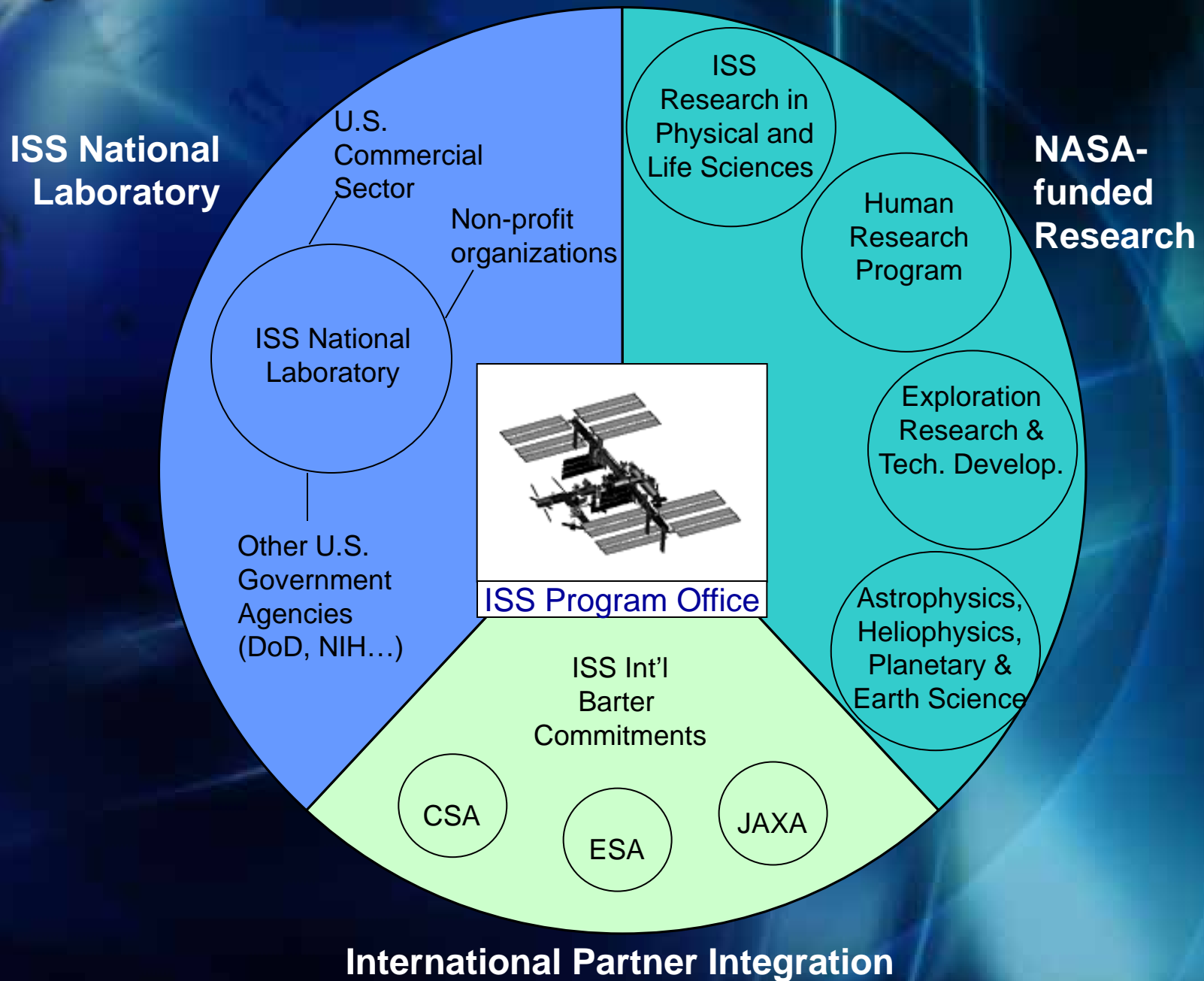
Julie A. Robinson, Ph.D.,
ISS Program Scientist, NASA
Outreach Seminar on the ISS
United Nations
February 2011

U.S. Research on ISS - Objectives

- NASA Utilization of the ISS (Vision for Space Exploration, January 14, 2004, and NASA Authorization act of 2005)
 - Astronaut health and countermeasure development for space exploration
 - Testing research and technology developments for future space exploration
 - Developing and validating operational procedures for long-duration space missions
 - Microgravity physical and life sciences program to maintain U.S. capability in these areas
- ISS National Laboratory beginning in 2010 (NASA Authorization Acts of 2005 and 2008)
 - Other U.S. government agencies use ISS to meet their agency objectives
 - Commercial and non-profit organizations use ISS in the interests of economic development in space
 - Pathfinders starting in 2008



Objectives for Research on ISS



NASA Research Infrastructure

2 Human Research Facility Racks



Microgravity Science Glovebox (MSG)



6 ExPRESS Racks



2 Minus Eighty-Degree Laboratory Freezers for ISS (MELFI)



Materials Science Research Rack



Fluids Integrated Rack (FIR)



Combustion Integrated Rack (CIR)



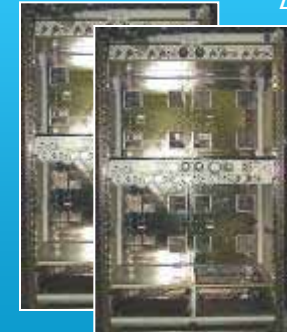
Window Observational Research Facility



MELFI-3



ExPRESS-7 and 8



Muscle Atrophy Research Exercise System (MARES)



Added for ISS National Lab

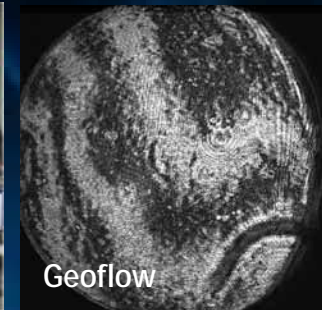
2001-2010

ISS Research In Progress

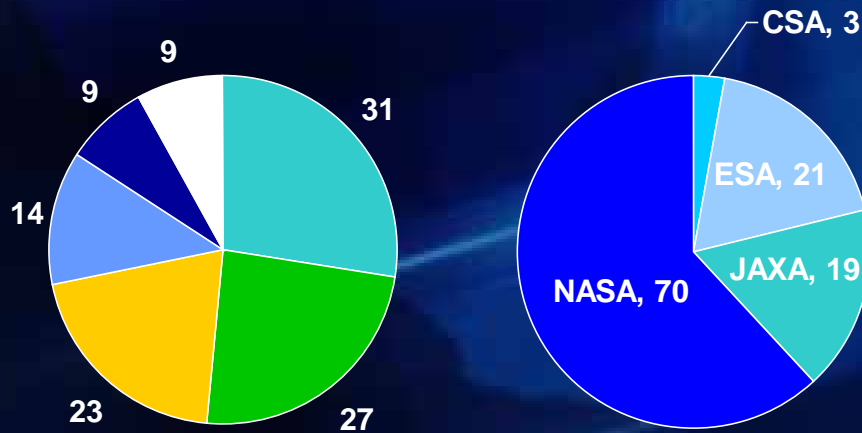


(Expeditions 25/26 , October 2010 – April 2011, data as of January 31, 2011)

- Expeditions 25/26
 - 113 U.S.O.S.-integrated investigations
 - 41 new investigations
 - 43 International Partner investigations
 - 20 National Lab investigations
 - > 350 scientists

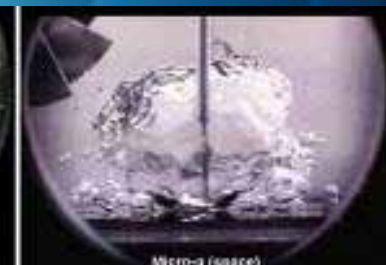
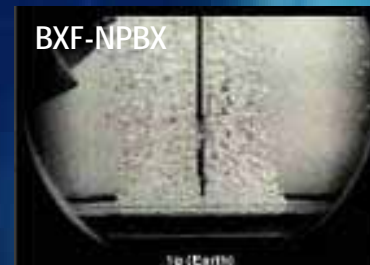


Number of Investigations, Expeditions 25/26



Scientific Disciplines

- Human Research
- Physical Sciences
- Earth and Space Science
- Technology
- Biology and Biotechnology
- Education



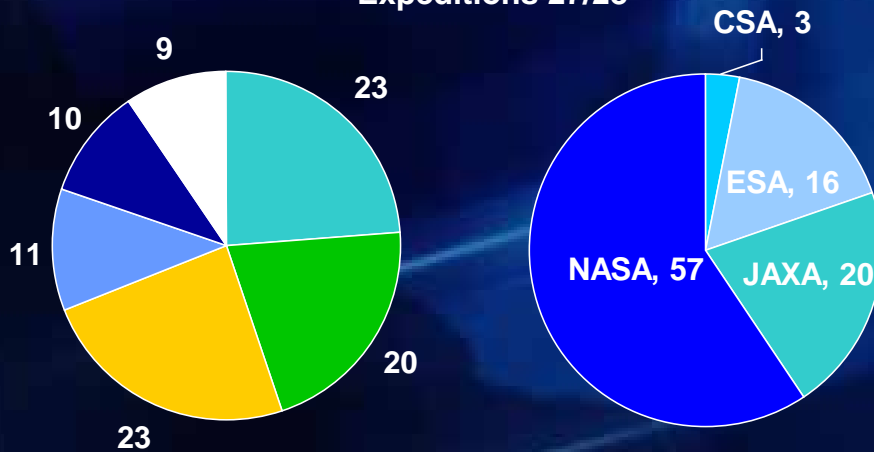
ISS Research Planned Research



(Expeditions 27/28 , April 2011 – October 2011, data as of January 31, 2011)

- Expeditions 27/28
 - 96 U.S.O.S.-integrated investigations
 - 15 new investigations
 - 39 International Partner investigations
 - 19 National Lab investigations
 - > 300 scientists

Number of Investigations, Expeditions 27/28



Scientific Disciplines

- Human Research
- Physical Sciences
- Earth and Space Science
- Technology
- Biology and Biotechnology
- Education



Highlights of Upcoming Research

- **AMS-02** seeks to understand fundamental issues on the origin and structure of the universe. (NASA)
- **Kinematics-T2** Biomechanics of treadmill exercise conditions during long duration spaceflight
- **NIH-1** evaluates immune cells exposed to microgravity in order to develop a new model for investigating the loss of immune response in older women and men.
- **Robonaut** is a technology demonstration for a dexterous robot
- **Amine Swingbed** tests a smaller more efficient vacuum regeneration system for removal of carbon dioxide from the ISS environment
- **CCF** studies a critical variety of inertial-capillary dominated flows key to spacecraft systems that cannot be studied on Earth.
- **Mouse Immunology** investigates specific mechanisms of immune system activation, and whether immune system cells exposed to challenges before flight retain the "memory" to fight challenges during space flight.

For More Information

ISS Reference Guide

Cumulative Results Reports:

NASA/TP-2009-213146-REVISION A

Education on ISS 2000-2006:

NASA/TP-2006-213721

World Wide Web

<http://www.nasa.gov/iss-science/>

Facilities Catalog

click on "Facilities" at web link above

ISS Research Blog "A Lab Aloft"

<http://go.usa.gov/atl>

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