

JAXA's Contribution to the International Collaboration through ISS/Kibo

- The 51st Session of Scientific and Technical Subcommittee of the Committee on the Peaceful Users of Outer Space -



HTV4



International Space Station



Controlled re-entry of HTV4

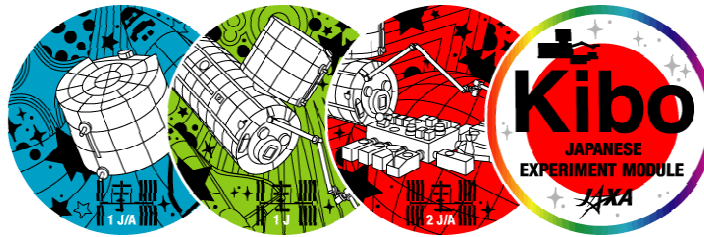


19 February, 2014

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Japan Aerospace Exploration Agency(JAXA)



Presentation Outline

- 1. JAXA Astronaut Wakata on the ISS Mission**
- 2. Kibo Utilization Overview**
- 3. New Capabilities for Kibo Utilization**
- 4. Kibo Asia Utilization Activities**



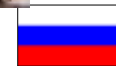
1. JAXA Astronaut Wakata on the ISS Mission



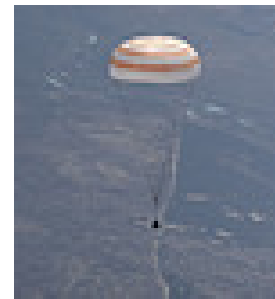
R. Mastracchio



Koichi Wakata



M. Turin



Launched on 7th November, 2013

Mission Summary

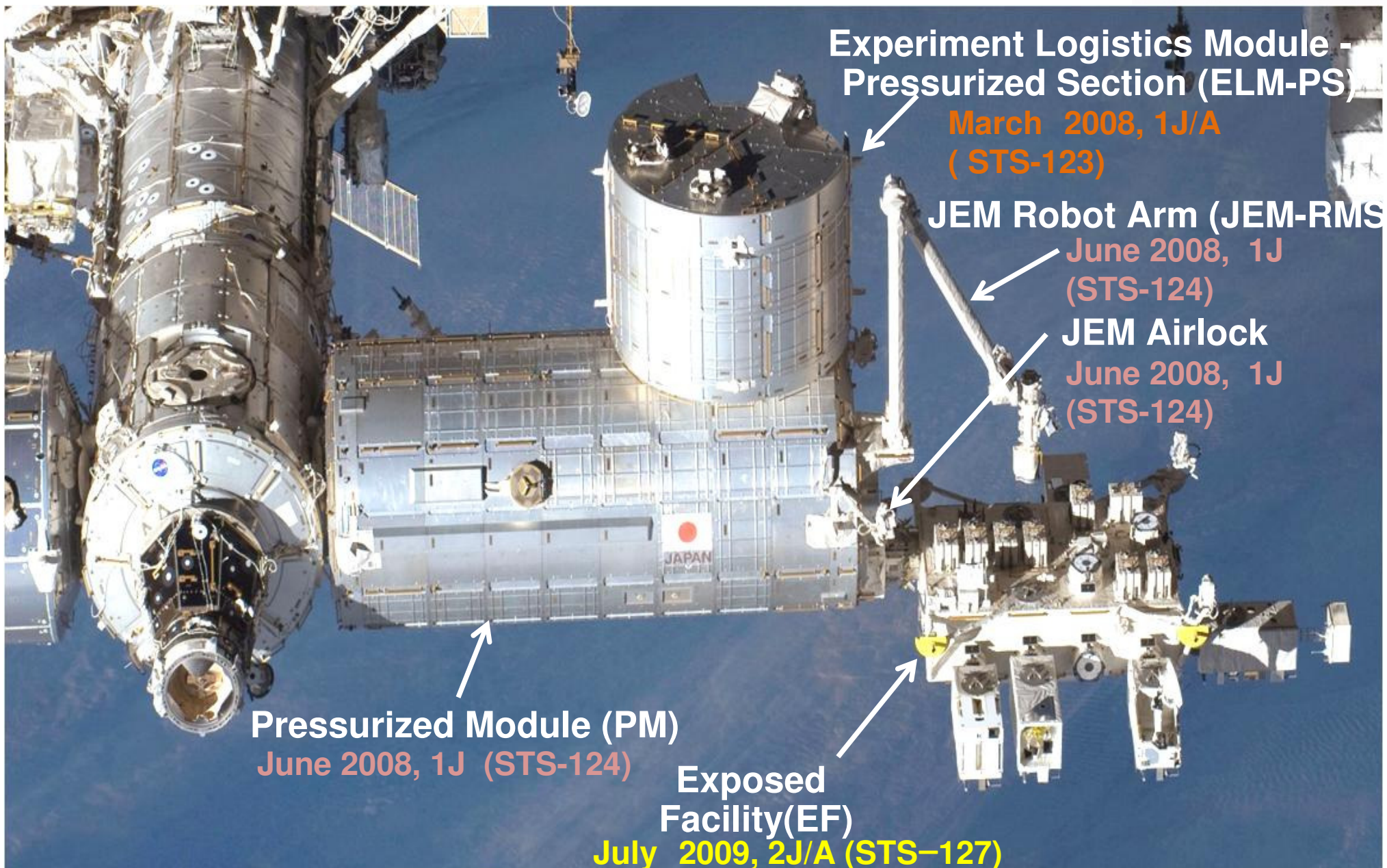
- Staying in the ISS from Nov. 2013 to May 2014.
- The first Japanese Astronaut assigned as the ISS commander starting from the middle of March.



Planned return in May, 2014

2. Kibo Utilization Overview(1/3)

Japanese Experiment Module-“Kibo”

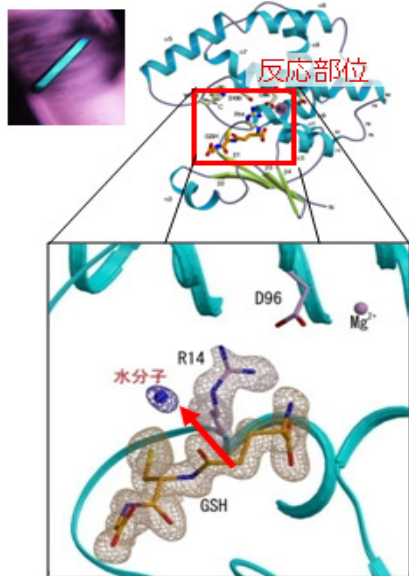


2. Kibo Utilization Overview (2/3)

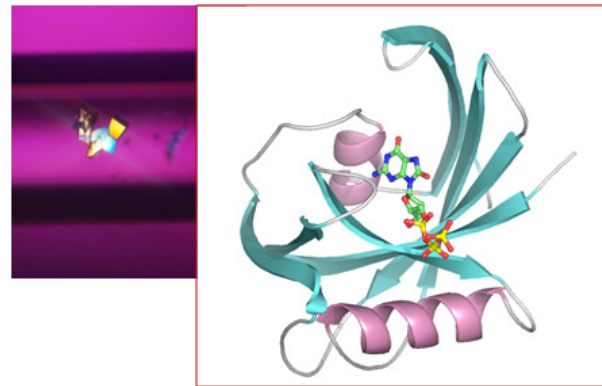
High Quality Protein Crystallization

- Can create protein crystals of better quality than on the Earth, with less distortion and disorder.
- Will lead to create new medicines and industrial applications.

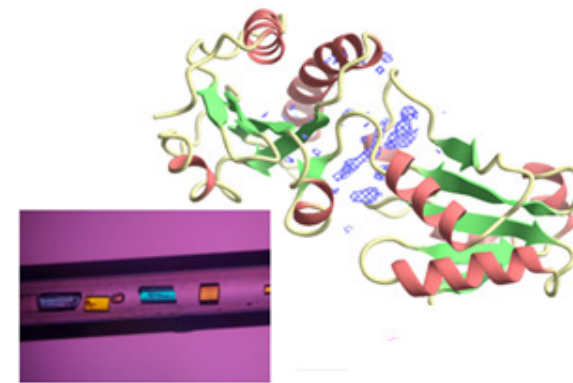
Develop new drug for muscle dystrophy



Develop new anticancer drug

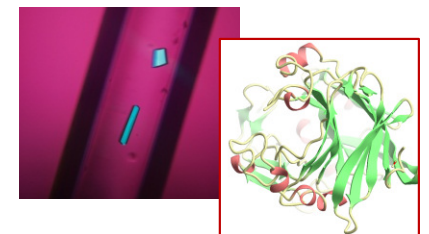


Determine mechanism of Alzheimer's disease



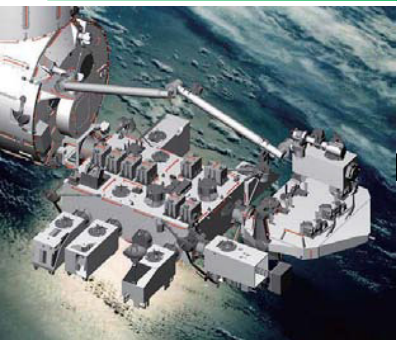
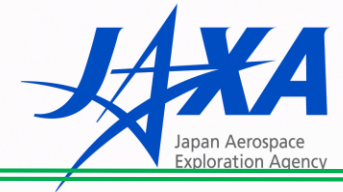
Develop high efficient enzyme;

- Cellulase
- Nylon Oligomer Hydrolase



2. Kibo Utilization Overview (3/3)

Astronomical / Disaster Monitoring



Two small commercial HDV Camcorders installed in Kibo Exposed Facility (EF)



JAXA Astronaut Wakata with Commercial 4K Camera installed in the ISS

Implementation of the KIBO HDTV to the International Disaster Charter



Flood in Phillipines



Hurricane Sandy, USA

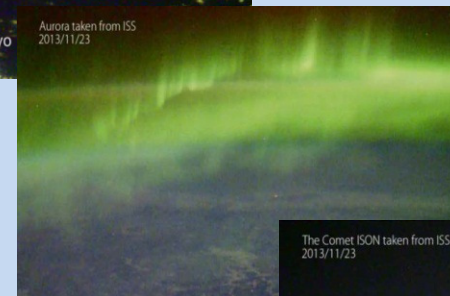


Wildfire, Queensland Australia

Super High-Definition Monitoring in Astronomical and Earth Observation



A Nightview Tokyo, Japan

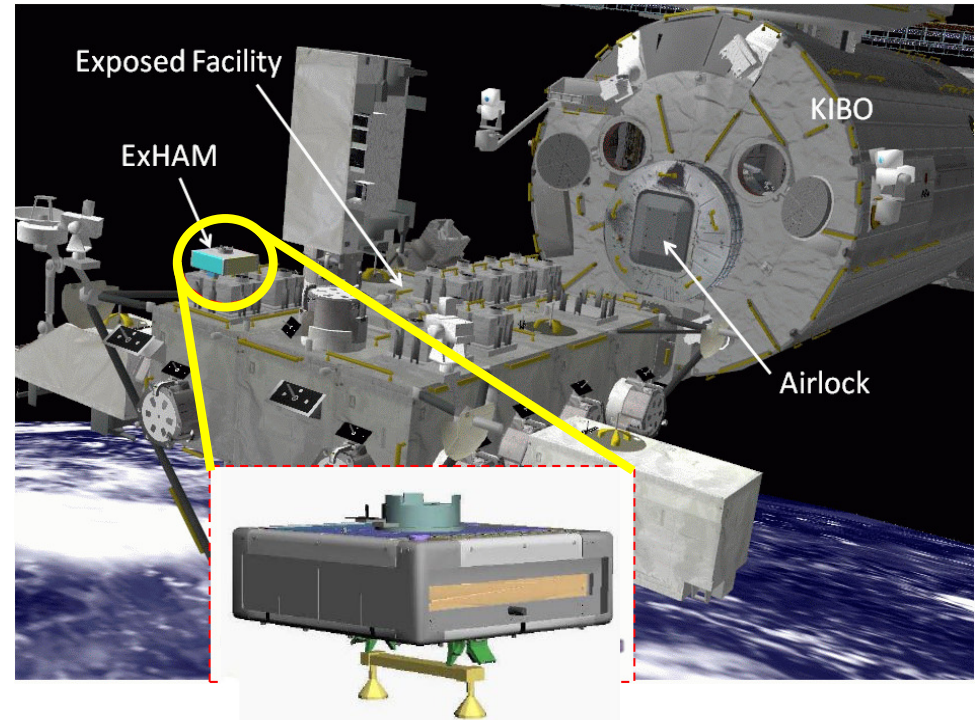
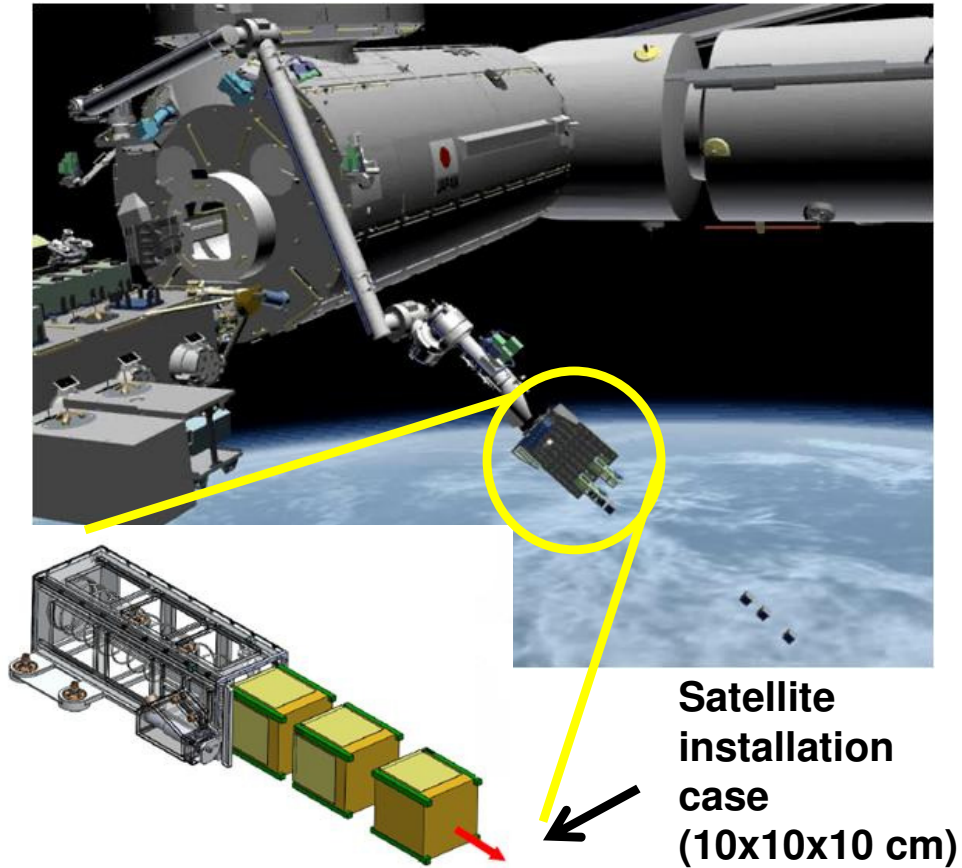


Aurora, Montana, USA



Comet ISON, Ontario, Canada

3. New Capabilities for Kibo Utilization



Examples of Utilization

- Material exposure
- Capture of space debris/aerosols
- Small device test



Kibo-ABC

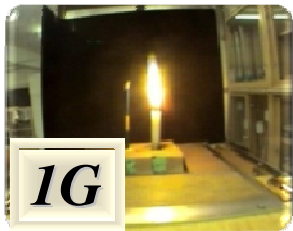


Asian Beneficial Collaboration through "Kibo" Utilization

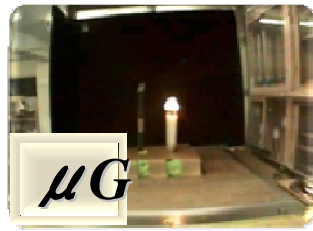
- **Established in 2012, in relation to the activity of “Asia-Pacific Regional Space Agency Forum (APRSAF) “**
- **Objectives to share benefits of ISS/Kibo;**
 - **Gateway to the Kibo Utilization**
Increase the awareness of ISS/Kibo’s benefits, and expand collaboration with nations in Asia and the Pacific.
 - **Capacity Building**
Provide micro gravity opportunities for students and young researchers which could lead to develop real space experiments/activities onboard Kibo.

4. Kibo Asia Utilization activities (Kibo-ABC)

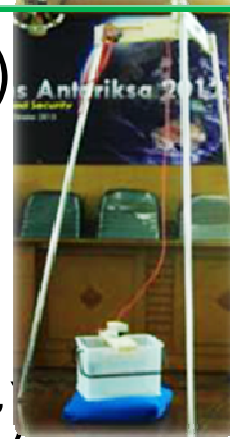
1. 1/2sec- μ G program (2012~)



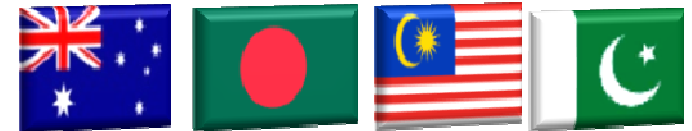
1G



μ G



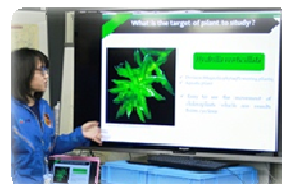
2. Try Zero-G program (2011~)



3. Space Experiment for Asian Future program (2011~)



4. Parabolic Experiment program (2006~)



4. Kibo Asia Utilization activities (Kibo-ABC)

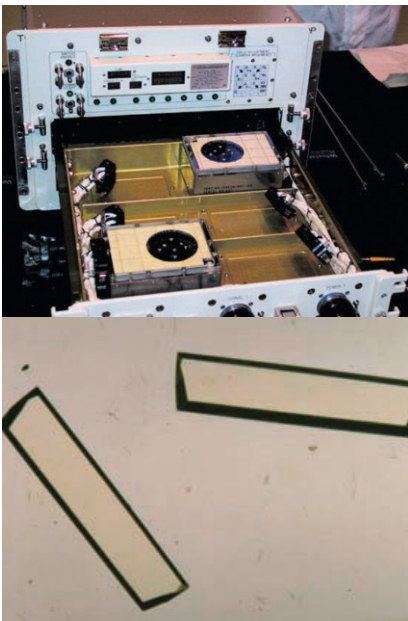
1. CubeSat deployment from Kibo



- “Pico Dragon”, developed jointly by the Vietnam National Satellite Center and the University of Tokyo.
- Launched by HTV4 in July 2013, and deployed into space by J-SSOD in November 2013



2. High Quality Protein Crystallization

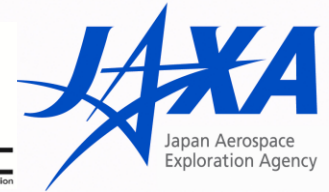
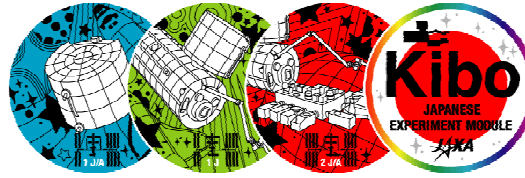


- Malaysian researchers participated in six experiments from 2009 to 2012.
- Main purpose was to train Malaysian researchers for space experiments.
- Solved 16 proteins 3D structure, which potentially result to new enzyme development.
- Graduated 2 Ph.D., and 4 MS through this project.



(Based on Prof. Raja Noor Rahman's Presentation in APRSAF-20, Hanoi, Vietnam, December 3-6)

Summary



- **JAXA continues to make contributions and cooperate in space exploration endeavour through the wide range of research activities on ISS/Kibo.**
- **We extend our sincere appreciation to all colleagues from different nations and to Kibo-ABC members, for their cooperation and support for Kibo utilization to achieve excellent results.**
- **We support the Human Space Technology Initiative of the UN Programme on Space Applications, and continue to make efforts in the scientific and technological development of humankind.**

I heartily thank all partners of COPUOS and the United Nations for giving me this special opportunity.

Thank you for your attention.