

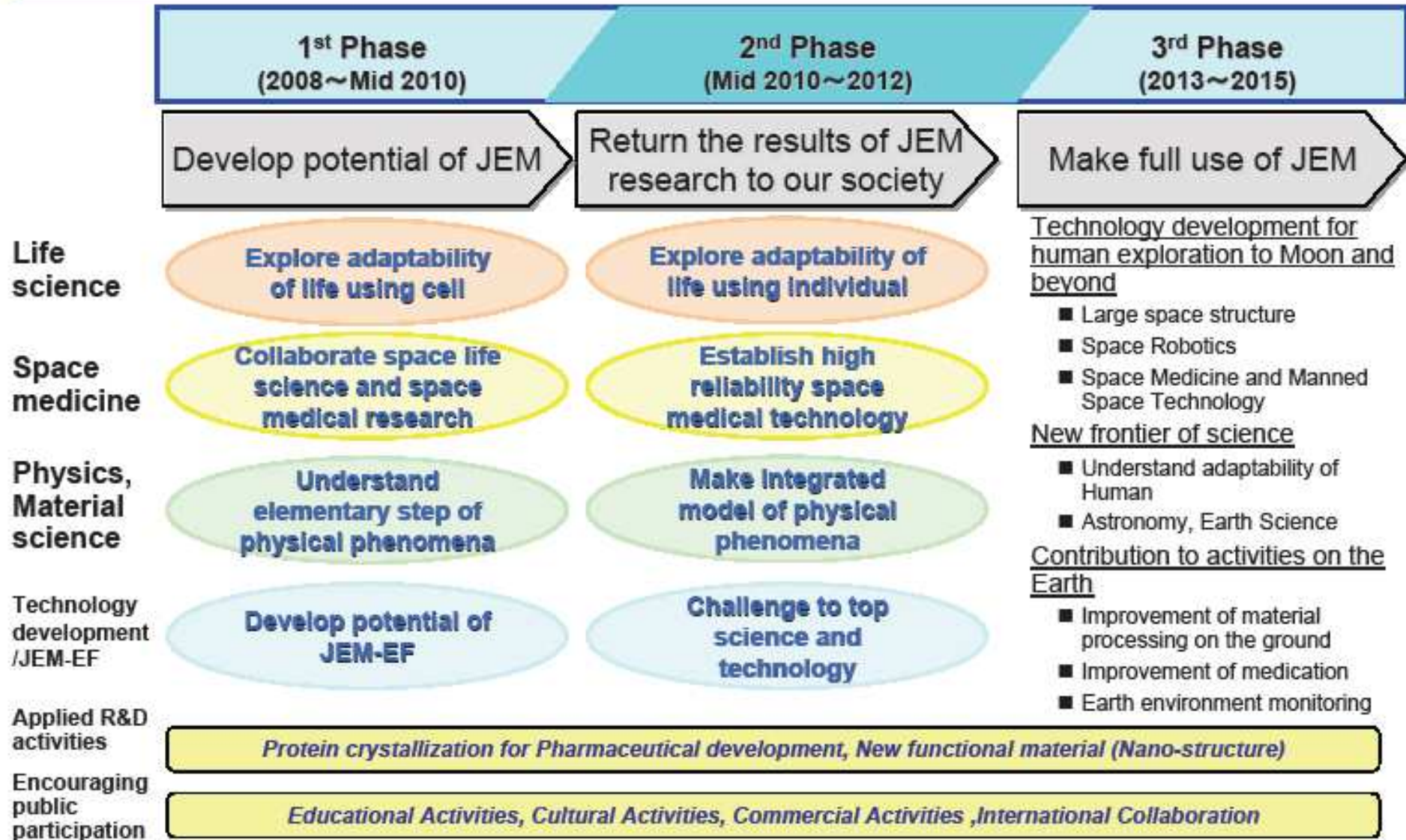
KIBO Utilization Plan

YOSHInori YOSHImura

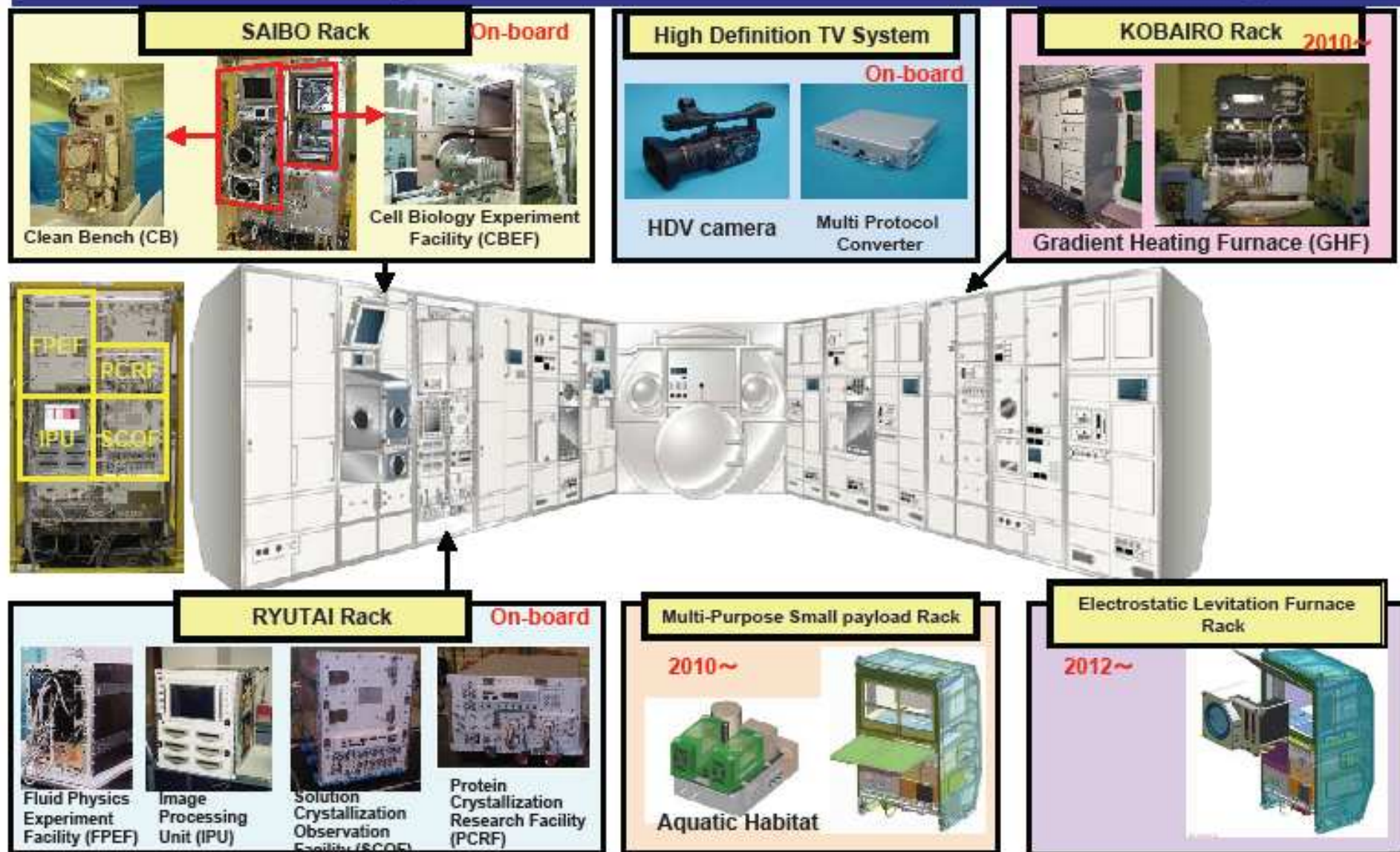
JAXA WDC Office

2008.11.14

Long term perspective of JEM utilization



Experiment Facilities in JEM-PM



Experiment Payloads on JEM-EF



Port Occupy Type Payload

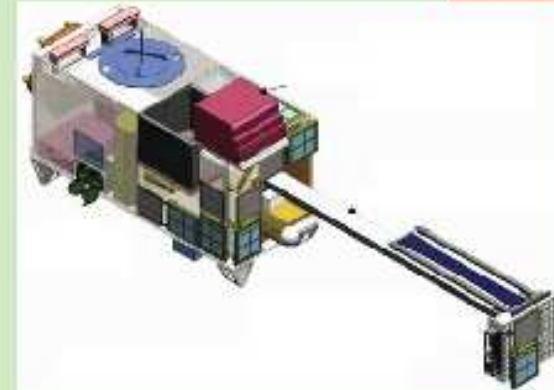
2013~



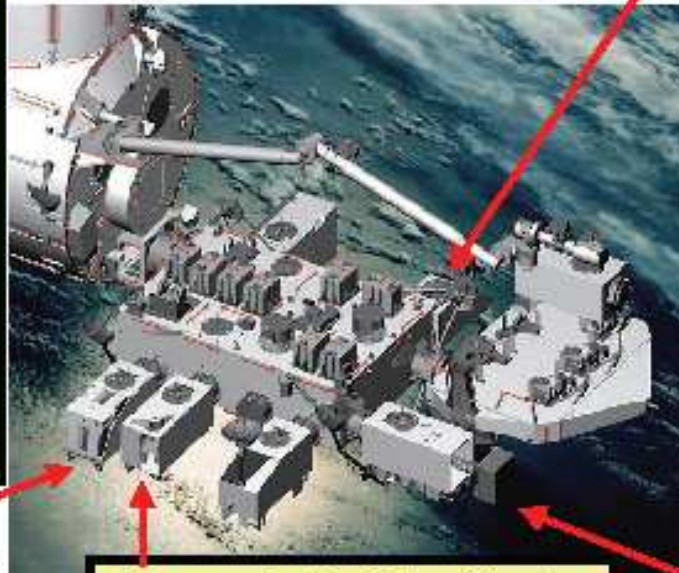
Large payload occupied JEM-EF port

Port Shared Type Payload

2011~



Small payloads shared JEM-EF port



Monitor of All-sky X-ray Image (MAXI)



- Monitoring of high-energy phenomena of X-ray emitting objects in space with an extremely high sensitivity
- Prompt dissemination of observational results all over the world through the internet

Superconducting Sub millimeter-wave Limb-Emission Sounder (SMILES)



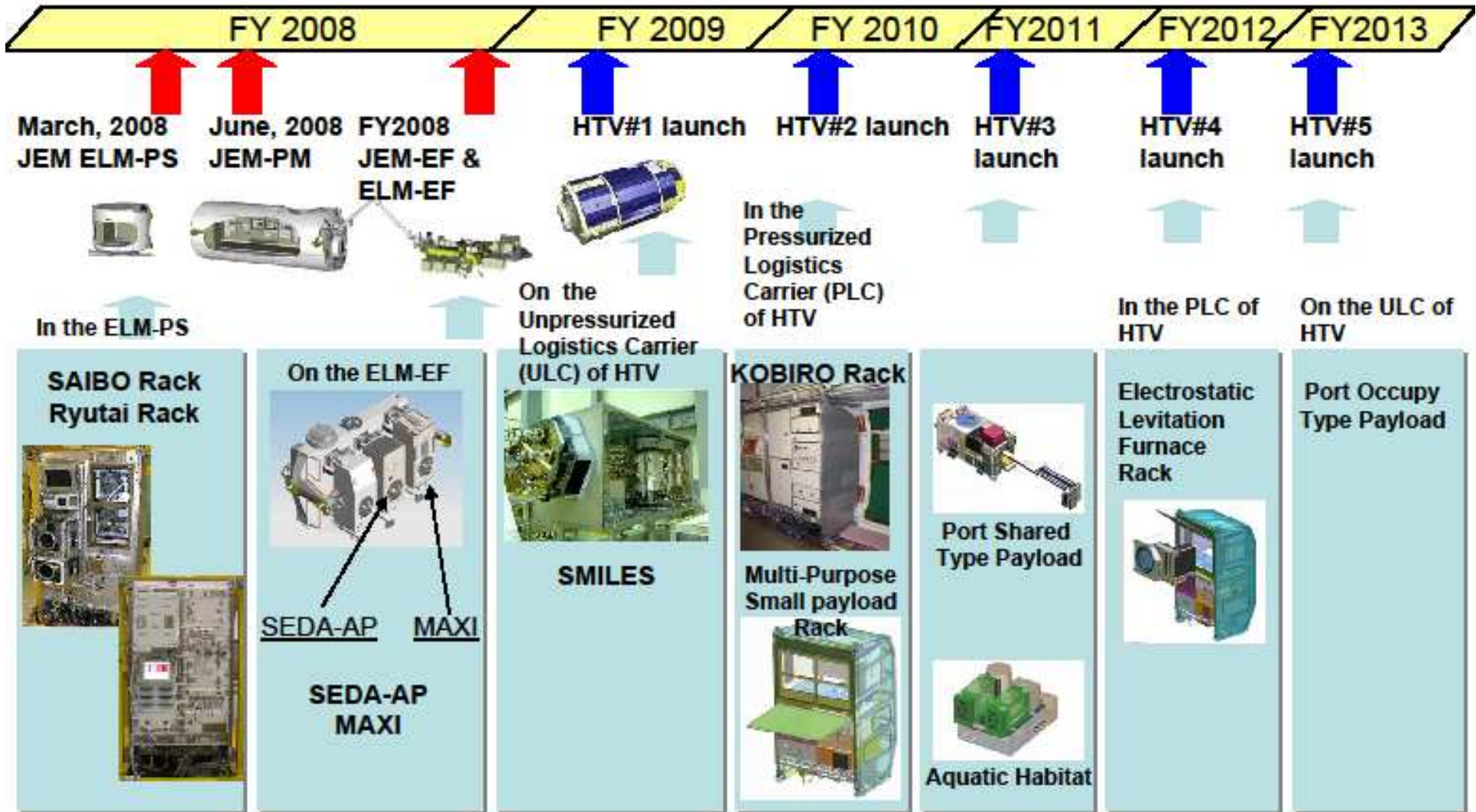
- Experimental observation of atmospheric minor constituents
- Demonstration of new sensor technologies as a forerunner of the world

Space Environment Data Acquisition (SEDA)



- Measuring space environment near ISS orbit such as radiation, plasma and atomic oxygen
- Exposing and evaluate electronic device and material in space

Launch Schedule of Experiment facilities



JEM-PM 2nd phase facility “Multi-Purpose Small payload Rack (MPSR)”



◆ Purpose

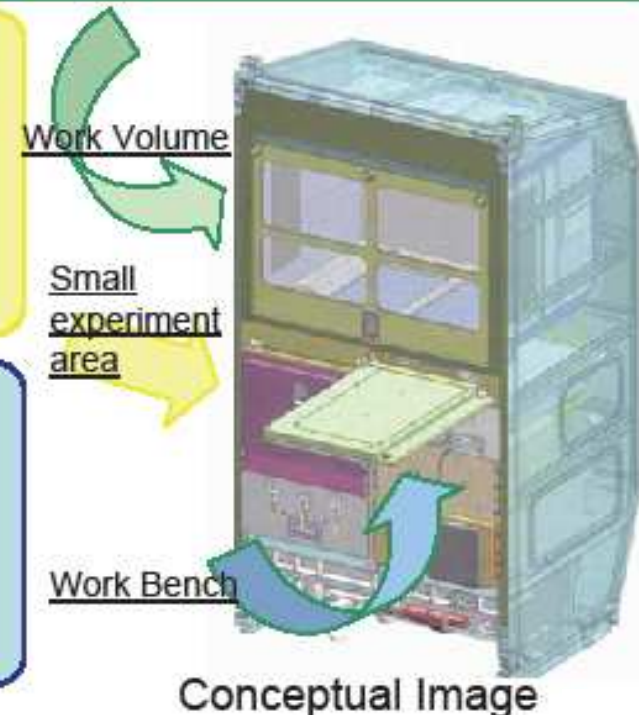
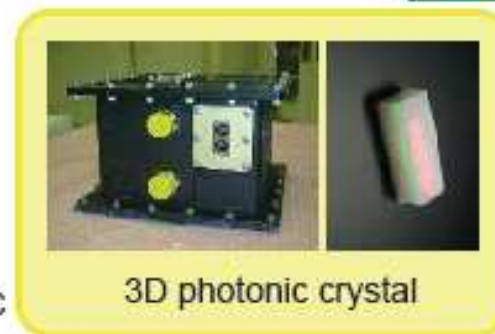
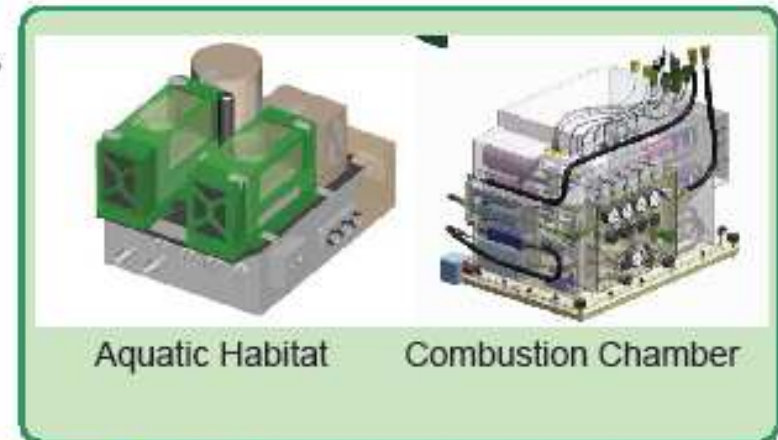
- Provide experiment space, working table and resources such as electric power and communications for small experiment equipment.
- The development cost of the user equipment should be low and the development schedule should be short.

◆ Status

- Development starts in this May.

◆ Overview & Specification

- Free work space
- Work bench
- User friendly interface
 - Power: 28, 16, 12VDC
 - Communication: Ethernet, USB
 - Video: Standard and High Definition NTSC
 - Cooling: cold plate, avionics air cooling
 - Vacuum bent / Gas supply
- Experiment control by laptop PC
- Safety
 - Temperature anomaly detection and power shutdown
 - Fire detection
 - Over-current protection



JEM-PM 2nd phase facility “Aquatic Habitat (AQH)”



◆ Purpose

AQH will be utilized for biomedical researches and fundamental biology in space.

- Biomedical researches
- Fundamental researches
- Educational researches, International cooperation

[Research Area]

- Alternation in gene expression
- Mechanism of Bone loss and muscle atrophy
- Effects of cosmic radiation

◆ Status

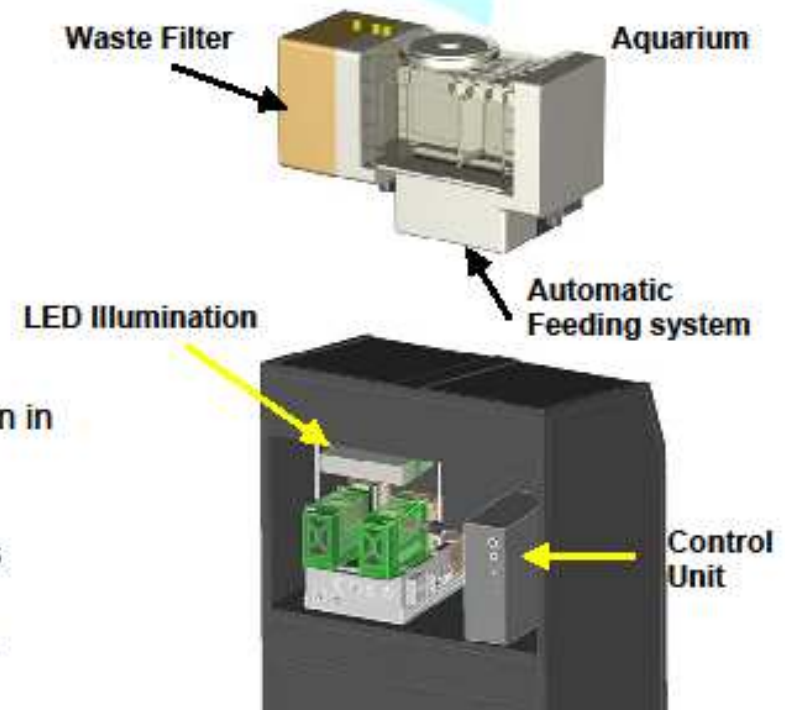
- Development started in this January

◆ Overview and Specification

- Breed small fish (Medaka, Zebra fish) across 3 generation in 90 days
- Artificial pulmonary ventilation
- Ammonia and Nitrous acid decomposition by bio-process
- Automatic feeding system
- Sampling, Chemical fixing, freezing of specimen by crew operation
- Observation by CCD



Breeding Test using the BBM



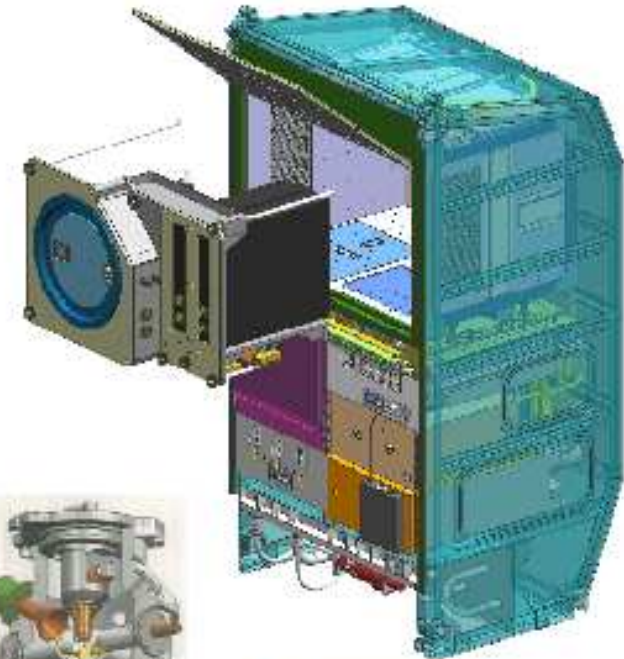
AQH in the MSPR

◆ Purpose

- Measure the thermo-physical properties concerning the high-temperature melt and the super cooled liquid
- Establish a theory concerning metastable material processing from super cooled condition
- Levitate metal and ceramic materials by an electrostatic force and melt samples without container

◆ Status

- Phase B study is going on.



Conceptual Image

The 2nd Phase JEM-PM utilization



- ◆ JAXA issued Announce of opportunities (AO) for the candidate experiments in 2007.
 - Execution period: From the mid FY 2010 to FY 2011 (about 1.5 year)
 - Fields:
 - Life sciences and relating technology development
 - Material sciences and relating technology development

- ◆ 14 candidates were selected from 73 proposals in Feb.,2008.

- ◆ JAXA will issue AO within a year to select science experiment candidates for FY2012.

- ◆ The preparation of other various utilization will be started in the near future.
 - Applied research
 - Education and culture and social science
 - Commercial utilization
 - International Collaboration

The 2nd Phase JEM-EF utilization



- ◆ JAXA issued Announce of opportunities (AO) for the candidate missions in 2006.
 - Launch: 2011 and 2013
 - Payload category
 - Port Shared Type: small missions are integrated as a JEM-EF standard payload
 - Port Occupy Type: one mission occupies one JEM-EF port
 - Fields
 - Science mission
 - Technology demonstration mission

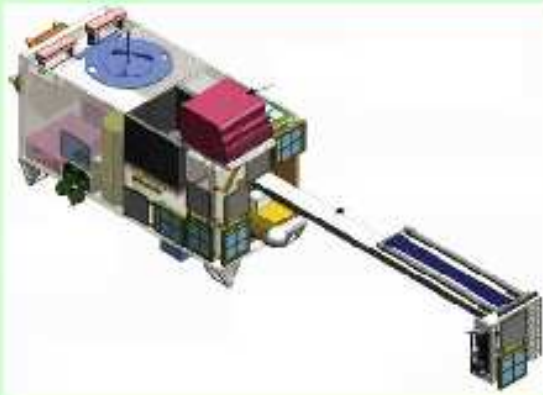
- ◆ Mission candidates were selected from 33 proposals in May, 2007.

- ◆ JAXA and mission team are conducting Phase A-B study.
 - Port Shared Type: 5 missions in Phase B study
 - Port Occupy Type: 3 missions in Phase A study

Candidate JEM-EF missions of the 2nd Phase



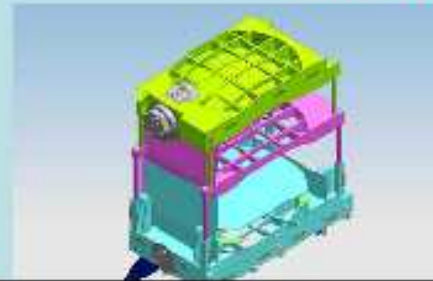
Port Shared Type Payload



- ◆ On-Orbit Demonstration of Space Inflatable Structure (SIMPLE)
- ◆ ISS Ionosphere, Mesosphere, upper Atmosphere, and Plasmasphere mapper (ISS-IMAP)
- ◆ JEM-GLISM (Global Lightning and Sprite Measurement)
- ◆ TANPOPO: Astrobiology exposure and Micrometeoroid Intact capture Experiments
- ◆ REXJ: Robot EXperiment on JEM

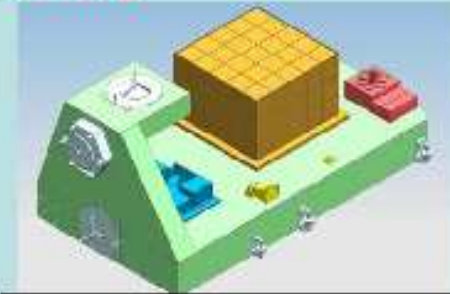
Port Occupy Type Payload

Select 1 mission from 3 candidates after Phase a Study



EUSO
(Extreme Universe Space Observatory)

To determine energy and direction of extreme high energy cosmic ray, and reveal it's generation source



CALET
(Calorimetric Electron Telescope)

To search origin of cosmic ray and dark matter by observing electron and gamma-ray in high energy cosmic ray

ADR
(Adiabatic Demagnetization Refrigerator)

Micro-gravity experiments of quantum fluid by using advanced continuous ADR system

