

October 23, 2010

One of JAXA Astronauts, Naoko Yamazaki, took STS-131 and flew up to ISS where she stayed 10 days and carried out a variety of tasks. We will look at how things are going in space and discuss the nature of living and working in space.

Highlight of STS-131 Mission

Day one: Launch of Space Shuttle, seven crew members onboard

Day two: Check out of Orbiter

Day three: Rendezvous and docking to ISS

Day four: Moving Leonardo Module from STS to ISS

Day five: Transferring payloads in Leonardo Module into ISS

Day five, six, seven and nine: Extra-vehicular activity

Day eleven: Storing equipments and materials to be carried down to Earth in Leonardo Module.

Day twelve: Moving Leonardo Module to STS cargo bay

Day thirteen: Departure from ISS

Day fifteen: Coming back to Earth

Unique space environment: Zero gravity(strictly micro-gravity), Zero-g state is realized within the body which is moving(falling) along with the acceleration of the space.

Every thing floats in space, which means apparently no gravity force.

Your body will not experience your body weight.

Do you imagine that you feel comfortable in space?

#### References

JAXA's June 2010 No.032

STS-131 Crew Photo(NASA)

JAXA's Astronauts(JAXA brochure)

Japanese Experiment Module "Kibo"(JAXA brochure)

#### Terminologies

Space: Synonymously used as cosmos or universe. Defined as outside 100Km above the Earth where the atmospheric pressure goes down below one over one million.

STS: Space Transportation System(=Space Shuttle)

Orbiter: Space Shuttle(=Orbitor+Fuel tank+Solid rocket booster)

Leonardo Module: Manufactured in Italy

ISS: International Space Station

JAXA: Japan Aerospace Exploration Agency

JEM: Japanese Experiment Module called "Kibo"

Living In Space: Preparations under microgravity: Preventive measures against spill -over of water or food in the cabin should be exercised.

@Food: All are dehydrated items(dried food), put water at meal time.

Water, juice and soup(fluid) contained in a aluminum foil or vinyl(plastic) bag

Toilet: personal adaptor to urine, vacuum(low pressure) suction to feces

Human wastes are burnt out by atmospheric reentry(Progress vehicle) , so that they may not degrade space environment.

@Control of cabin temperature and moisture level

Water brought up from the ground and kept in the tank(ISS)

By-product of fuel cell(liquidized oxygen and hydrogen yield electricity plus water, in case of Space Shuttle)

Absorption of carbon dioxide by chemical compound

@CELSS (閉鎖生態系生命維持システム) Closed Environment Life Support System and ECLSS: Environmental Control and Life Support System

Major research area for recycling everything for astronauts, harvesting food and carrying out waste management

Performance = function(plants, animals, gases, water, machine, light,...)

Environment of Earth is called Biosphere. The researchers are trying to make a biosphere in a small scale, ie., the scale of ISS or office buildings. It is very important to build the Moon base in the future.

Researches are carried out to look at how the seeds or plants grow under microgravity. Basically they have no problem to grow in space.

@Effects of space environment to humans: Bone and muscle loss(microgravity), High probability of cancer(space radiation), Fluid shift to upper torso (microgravity), Less immunity(microgravity)

@Psychological compatibility of the crew in space travel: Selection of the crew for a specific mission needs to be done so that all the crew may work in harmony, and may not come to confrontation(quarrel) during the mission. Combination of the crew will be decided upon the personal preference, psychological test as well as medical examination.