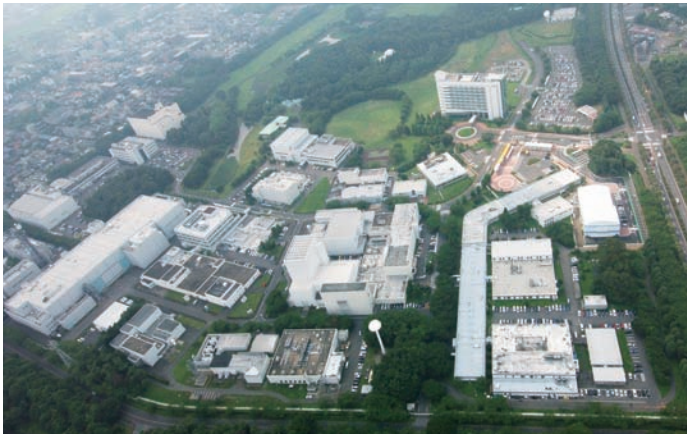


Tsukuba Space Center

Leading space development in Japan

The Tsukuba Space Center was built in 1972 as a part of Tsukuba Science City. It covers about 530,000 square meters, and is an integrated office equipped with the latest testing facilities in an environment full of greenery suited to a “Science City”. The Tsukuba Space Center operates as the core center for space development in Japan, undertaking the following activities promoted by JAXA: ●Development and operation of satellites that act as our eyes in space, and analysis of observational images from those satellites ●Utilization of space environment with the Japanese Experiment Module “Kibo” on ISS, and astronaut training and assistance ●Development of launch vehicles, space transportation systems, and technology research aiming at the establishment of a technology platform.



Exhibition of a real H-II Launch Vehicle flight model

The Tsukuba Space Center features a real H-II Launch Vehicle flight model that is about 50 meters in length displayed in the Rocket Plaza near the main gate. The H-II Launch Vehicle is a 100% domestically produced launch vehicle that was developed over roughly 10 years, and at the time it was completed, had world-class launch capability and performance. Japan established its independent technology for large-scale launch vehicles through developing and launching of the H-II Launch Vehicle.

The launch vehicle is being currently renovated with the aim of developing even higher capability and higher performance H-IIA and H-IIB Launch Vehicles.



Exhibition Hall “Space Dome”

“Space Dome” is an exhibition hall where you can see exhibitions which show genuine space development, including test models of various satellites, rocket engines used in firing tests, and a full scale model of the Japanese Experiment Module “Kibo.”



①Dream Port

You are greeted by a beautiful 1:1,000,000 scale globe. We introduce “the now” of JAXA's initiatives and space development.

②Utilization by Satellite

An introduction to the purpose and result of each project centers around a display of a test model satellite (nearly identical to an actual satellite).

③Humans Space Utilization

An introduction to the International Space Station program and space environment utilization centers around a full scale model of the Japanese Experiment Module “Kibo” and a test model of the space station H-II Transfer Vehicle (HTV).

④Launch Vehicles and Space transportation systems

Display of actual LE-7 and LE-5 liquid rocket engines used in firing tests, and an introduction to Japanese launch vehicles centered around a 1:20 scale model.

⑤Space science research & lunar and planetary missions

An introduction to space science and lunar and planetary missions centers around the test model lunar explorer satellite, “KAGUYA.”

- Open from 10:00 a.m. to 5:00 p.m.
- Closed on New Years’ Holidays, facility inspection days
- Admission is free of charge

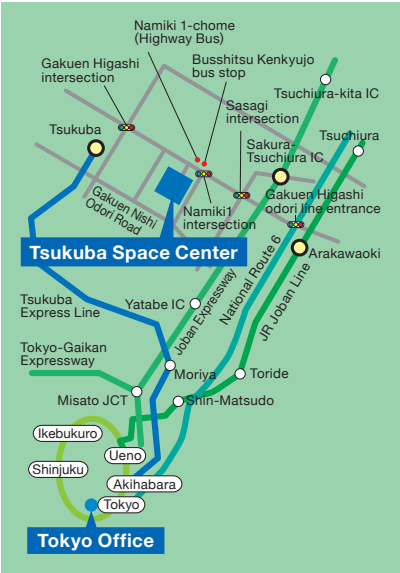
Tour information

- Guided tour (reservation required)/ Guided introduction of the Exhibition Hall and building facilities. Advance booking is required. Please contact the Tour Office for details. Tel: +81-(0)29-868-2023 (Tour Office) Email: ANNAI.TKSC@jaxa.jp

Access Map

Access by public transportation

- By train
 1. Take the JR Joban Line to Arakawaoki Station/ Take the Kantetsu Bus going to Tsukuba daigaku chuo (Tsukuba University Chuo)/ Get off at Busshitsu Kenkyujo and walk 1 minute
 2. Take the Tsukuba Express Line to Tsukuba Station/ Take the Kantetsu Bus to Arakawaoki Station/ Get off at Busshitsu Kenkyujo and walk 1 minute
- By car
 1. Take the Joban Expressway/ Exit at the Sakura Tsuchiura Interchange
 2. Take Highway Route 6/ Exit at the Gakuen Higashi Odori line entrance, 10-minute drive to Tsukuba Space Center (5 km)
- By busTake the highway bus from Tokyo Station (Yaesu South Exit) going to Tsukuba Center/ Get off at Namiki 1-Chome and walk 1 minute
- By taxi20 minutes from Tsuchiura Station15 minutes from Arakawaoki Station10 minutes from Tsukuba Station



Tsukuba Space Center

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Tsukuba Space Center



Japan Aerospace Exploration Agency

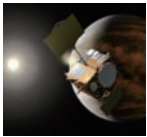
JAXA's mission is to pursue the infinite possibilities for future development in the space.

We feel a longing and awe towards the vast universe that seems to be boundless. Such feelings have been harbored since the start of humankind. The world that our ancestors gazed up upon and could only imagine is now an important field actively explored by humankind with the aid of incredible advances in science and technology. Through these advances, a deep link was formed between space and all the people living on our planet. Although the vast universe remains shrouded in mystery, it reveals an infinite number of possibilities. JAXA will continue to carry out great missions in order to pursue these mysteries, to expand our activities even further, and to give firm support to ensuring a secure and prosperous lifestyle.

Japan Aerospace Exploration Agency activities

Space Science

Explore the mysteries of space and the solar system, as well as the mystery of the forming of the earth and the beginning of life.



Satellites and Observational Imaging

Observe the earth with our “eyes” in space. Support our lifestyle with use of satellites.



Utilization of Space Environment

A new environment is grasped by humankind. International Space Station program is underway to explore the possibilities for utilization of the space.



Space Transportation System

Open up the possibilities for transportation systems that link the earth and space, and help development of space activities.



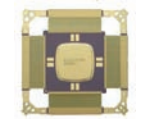
Aviation Research and Development

Aim to contribute to growth of the aviation industry and make new developments for future air transportations.



Fundamental Technology Research

Establish an autonomous technology platform through continuous accumulation of research.



Tsukuba Space Center Organization

The Tsukuba Space Center is made up of 5 directorates– the Space Transportation Mission Directorate, Space Applications Mission Directorate, Human Space Systems and Utilization Mission Directorate, R&D Directorate, and a part of the Institute of Space and Astronautical Science. The Tsukuba Space Center, which is the central office of JAXA, operates as the core center of space development in Japan, and as such, it is the stage for various activities, including research, development, and testing in the latest fields of space development.



- S-Zone(South)**
 - S-1** Satellite Test Building Radiometer Ion Test Laboratory
 - S-3** 6-Meter-Diameter Radiometer Space Chamber Building
 - S-4** 8-Meter-Diameter Chamber Building
 - S-5** Guidance and Control Test Building
 - S-6** Research and Development Building
 - S-7** Electronic Equipment Test Building
 - S-8** Exposed Section Mission Application Test Building
 - S-9** Laser-Based Communication Experiment Test Building
 - S-10** Spacecraft Integration and Test Building
- E-Zone(East)**
 - E-1** Information
 - E-2** Public relations / Information Building
 - E-3** Material Experiment and Development Building
 - E-3** Exhibition Room
 - E-4** Computer Center
 - E-5** Tracking and Control Building

- C-Zone(Center)**
 - C-1** Headquarters Building
 - C-2** Cafeteria and Recreation Rooms
 - C-3** Structural Test Building
 - C-4** Small-sized Satellite Test Building
 - C-5** Astronaut Training Facility
 - C-6** Weightless Environment Test Building
 - C-7** International Space Technology Exchange House
 - C-8** Spacecraft Magnetic Test Site (Control Room)
 - C-9** Spacecraft Magnetic Test Site
 - C-10** Library
- W-Zone(West)**
 - W-1** Radio Test Building
 - W-2** Space Station Operation Facility
 - W-3** Space Experiment Laboratory
 - W-4** Space Station Test Building

The Tsukuba Space Center plays a multifaceted role in thinking about the future of space.

Development and realization of better satellite systems

Satellites such as communications and broadcasting satellites, meteorological satellites, and earth observation satellites, are essential tools in our lives. We develop all types of satellites with the aim to acquire basic satellite technology to meet demands for greater diversification and sophistication, improve earth observation technology, and realize advanced satellite communications technology. Development and demonstration tests are conducted on basic satellite technology, on-orbit technology, and communications technology, in order to create high performance satellites. Satellites are produced one after another in this Center that incorporates the latest technology, such as solar panels that provide a large amount of power to the satellites, increased precision of attitude control, ion engines and mobile communications devices, and various sensors used in earth observation, and each satellite mission has been a great success.

Consolidated Space Tracking Control (Network) Nerve Center

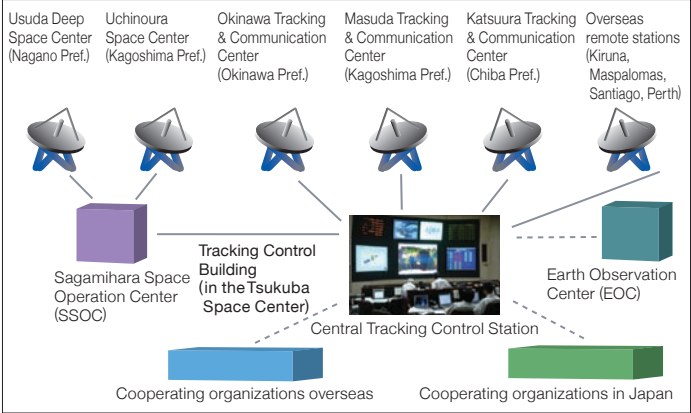
Thousands of satellites are orbiting the earth. The primary role of tracking control is to select and observe the objective satellite from among those in orbit, and control that satellite by sending and receiving signals. Tracking and Communication Stations are required in each region to ensure that this function is carried out smoothly and accurately. The Tsukuba Space Center Tracking Control Building operates as the nerve center of tracking control, collecting data received by each Tracking and Communication Station, and efficiently tracking and controlling each type of satellite.



- Greenhouse gases Observing SATellite “IBUKI” (GOSAT)**

“IBUKI” (GOSAT: Greenhouse Gases Observing Satellite) is an artificial satellite that observes the concentration distribution of greenhouse gases from outer space, and its purpose is to contribute to the international effort toward prevention of global warming, including monitoring the greenhouse gas absorption and emission state. “IBUKI” is able to measure the concentration distribution of greenhouse gases over almost the entire surface of the earth using sensors from its orbit traveling around the earth within approximately 100 minutes. Data on the concentration of carbon dioxide and methane gas in the atmosphere is being disclosed to the public as of February 2010. Future plans are underway to improve the quality of analytical results and continue providing information to the public.
- Wideband InterNetworking engineering test and Demonstration Satellite “KIZUNA” (WINDS)**

“KIZUNA” is a satellite that links the network between the space and the earth, and is used in technological demonstration tests to establish ultra-high speed and high capacity communications technology using satellites. In March 2010, data was successfully transmitted in high speed from the National Astronomical Observatory of Japan VERA Observatory through the “KIZUNA” line to the National Astronomical Observatory of Japan Mitaka Campus and experiments were successfully conducted in quasi-real-time processing. The technology takes advantage of the fact that satellite communications are far-reaching, multicasting, and disaster-resistant. The project will enable high-speed, large-volume data transmission, and aims to construct ultra high speed international Internet access, especially with Asian Pacific countries and regions.



- Tracking Control Network**

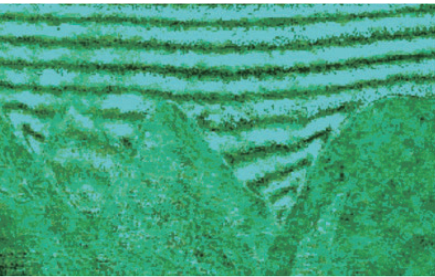
A tracking control network is established and centered around the Tsukuba Space Center Tracking Control Building ensures efficient tracking and control of each type of satellite.

Possibilities of Space Enviroment Utilization

The space environment features many characteristics that are difficult to attain on earth, such as microgravity, high-vacuum, preferable views, cosmic radiation, and an abundance of solar energy. This environment is used in the Japanese Experiment Module, “Kibo”, to carry out a variety of experiments including Marangoni convection experiments, ice crystal growth experiments, and protein crystal growth experiments. Studying the use of the space environment offers great potential for contributing to development of new technology, astronomy, earth observation and more in various fields, such as materials science and biotechnology.

Participation in the International Space Station Program

The International Space Station (ISS) is a multi-purpose human space facility that is built in orbit approximately 400 km above the Earth. In July 2009, the Japanese Experiment Module “Kibo” Japan Test Building was completed. In September 2009, an H-II Transfer Vehicle (HTV) that was developed as a cargo transfer vehicle to the ISS was successfully docked to ISS and plays an important role in international collaboration projects. The Tsukuba Space Center is used to support Japanese space development from all angles, including system operation and conducting of experiments with “Kibo”, operation and control of the HTV, and supporting such operations of astronaut Soichi Noguchi who stayed at the ISS for a long period during 2010.



- Ice crystal growth experiments at the Japanese Experiment Module, “Kibo”**

Solution Crystallization Observation Facility (SCOF) (left) and a crystal bound in a flat surface (right). Temperature and density can be calculated from the bars appeared in the crystal bound.



- Control Room for the Japanese Experiment Module, “Kibo”**

The operation of “Kibo” is performed 24 hours a day, 365 days a year by a team of over 50 people including the flight director, and operating and control staff in three shifts.
- Astronaut Naoko Yamazaki checking the placement of on-board lab devices in a full scale mockup of the Japanese Experiment Module, “Kibo” (left)**

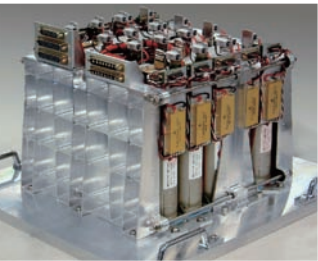
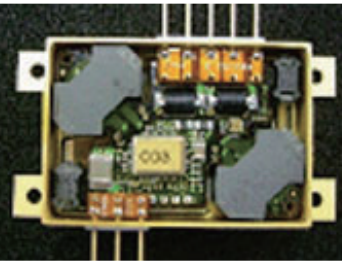
Training concerning “Kibo” for astronauts who will board the International Space Station (ISS) is carried out at Tsukuba Space Center.

Research and development of new technology to prepare for the future

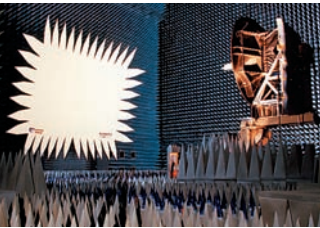
Research of systems and devices including of component fundamental technologies, high-performance attitude control, small-sized power systems, high-speed on-board computer, space environment measurement sensors, space verification systems using small-size experimental satellites, rocket/satellite analysis and software technology, thermo-structure-fluid analysis and tests, structures and materials, and satellite propulsion is carried out to increase spacecraft performance and reliability. Furthermore, steady progress is being made on research on the latest technology for the next generation including research on space energy utilization systems.

Tests and verification to ensure higher reliability in space

Various ground experiments must be conducted to develop highly reliable spacecraft that can be operated precisely to meet goals in the harsh space environment. Vibration and acceleration at rocket launch and vacuum conditions and temperatures of space are simulated at the Tsukuba Space Center to test spacecraft functions and performance. Furthermore, research and development of test methods and assessment and verification methods is carried out based on technology accumulated through previous tests to contribute to development of new satellites and launch vehicles.



- A DC/DC converter developed part for space application (left) and a 100Ah lithium-ion battery (right)**



- Radio Test Facility (Radio Test Building)**

This facility is for conducting radio system tests on satellites as well as tests on onboard antennae and radio wave sensors in rockets and satellites, and measure their radio wave properties.
- Space Environment Measurement Research Facility (R&D Building)**

This facility is for conducting research and development on instruments for measuring space environment (radiation, atomic oxygen, infrared rays, x-rays, etc.) to which satellites are exposed.



- 13mφ Space Chamber (General Environment Test Building)**

This chamber is for checking the environment resistance of satellites in a space vacuum and thermal environment.
- Large Scale Vibration Test Facility (General Environment Test Building)**

This facility is for conducting vibration tests on each satellite and rocket system or on parts of the system.