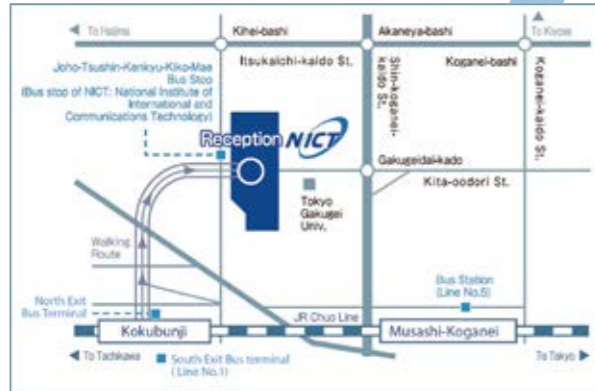


Location of R&D bases

Headquarters
 (Planning Office, Space Communications Laboratory)
 4-2-1 Nukui-Kitamachi, Koganei, Tokyo 184-8795, Japan



Kashima Space Technology Center
 (Planning Office, Space Communications Laboratory)
 893-1 Hirai, Kashima, Ibaraki 314-8501, Japan



Yokosuka Research Park
 (Planning Office, Wireless Systems Laboratory)
 3-4 Hikarino Oka, Yokosuka, Kanagawa 239-0847, Japan



Wireless Networks Research Center

Yokosuka Tel:+81-46-847-5050
Headquarters Tel:+81-42-327-7429
Kashima Tel:+81-299-82-1211

E-mail: publicity@wireless.nict.go.jp

Please contact the Public Relations Department for general inquiries about the NICT.

National Institute of Information and Communications Technology (Headquarters)

URL: <http://www.nict.go.jp/>

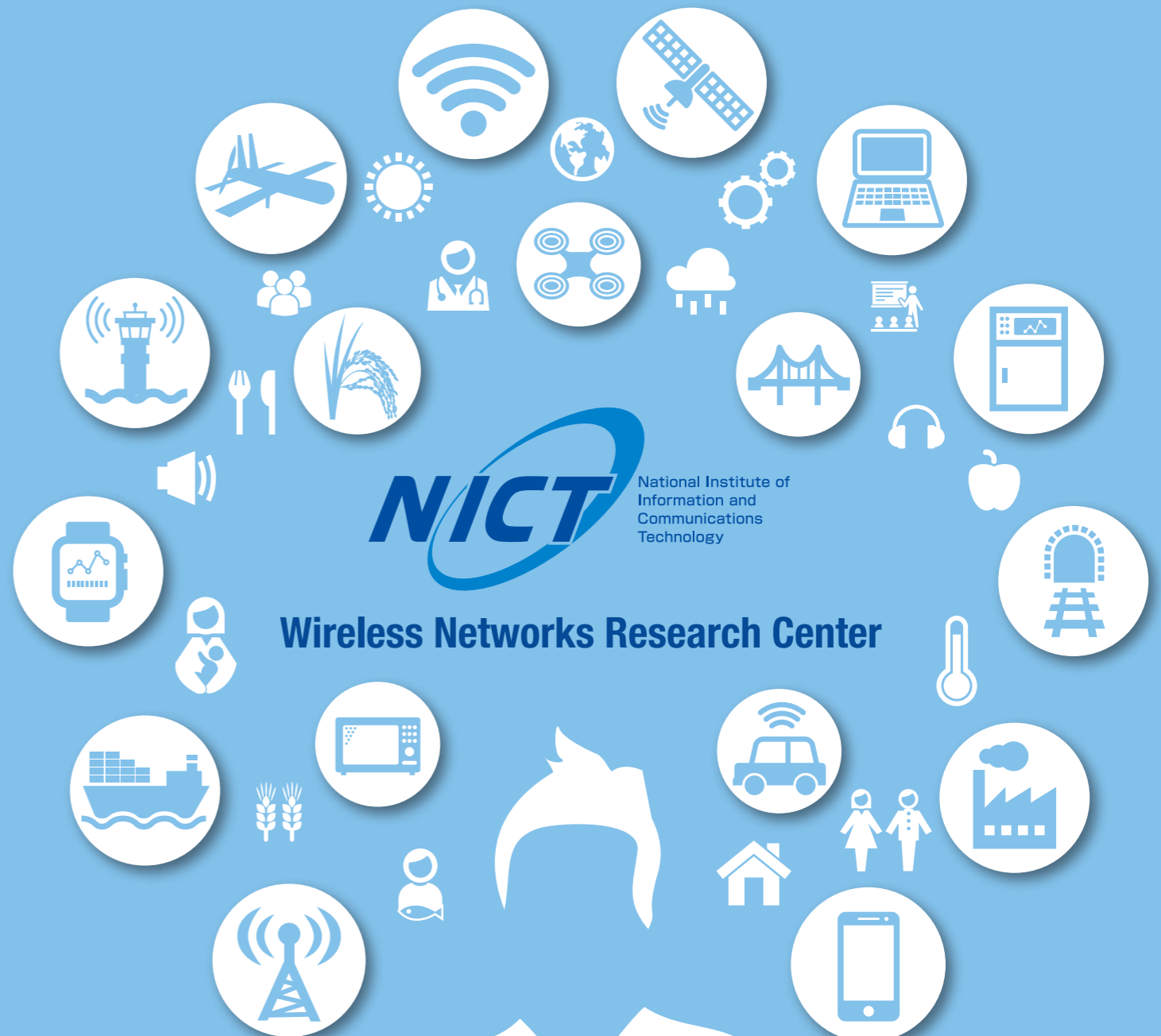
4-2-1 Nukui-Kitamachi, Koganei, Tokyo 184-8795, Japan

Tel: +81-42-327-5392 Fax:+81-42-327-7587

E-mail: publicity@nict.go.jp



Creating our future and present
 with wireless



Wireless Networks Research Center



Connect flexibly, certainly and rapidly —

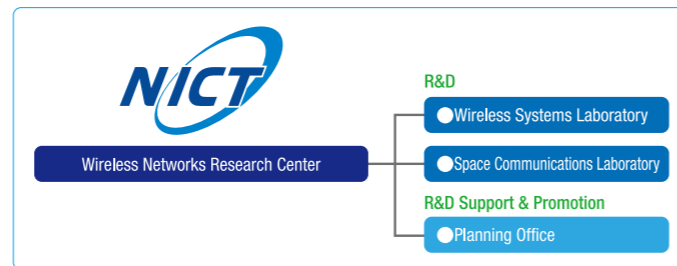
We create new values and unprecedented security to realize a super smart society.

The history of studying wireless technologies at the National Institute of Information and Communications Technology (NICT) dates back to 1896 when the Radio Telegraph Research Division of Electrotechnical Laboratory in the Ministry of Communications started researches on radio telegraphy. This is the beginning of studies on wireless communications in Japan.

About 120 years later, wireless communication technologies have made dramatic progress. They act as foundations for cell phones, smart phones, television, radio, GPS and many other communication tools for daily use. Internet of Things (IoT) will soon connect each terminal and equipment to the Internet. Wireless communications, such as satellite communications and cell phones, are also the most reliable communication tools in mountainous areas and island nations where optical cables are difficult to be laid or when a serious disaster occurs. Wireless communication technologies have become indispensable to our daily lives.

However, while wireless communication becomes widely used and services get increasingly diversified, the volume of traffic has been growing explosively, and we are now facing a possible shortage of usable frequencies.

The Wireless Networks Research Center of NICT conducts R&D of technologies for wireless communication systems and networks which will achieve the flexibility and the accuracy to connect people and things in all situations, and the efficient use of both frequencies and energy resources in order to provide secure and widely varying communications.



R&D vision

Anything

Wireless networks to enrich our lives by new frequency application technology

Anytime

Wireless networks that can be used for both an emergency and a peacetime

Anyplace

Worldwide networks ranging from ground and marine to space



Bring research results to society

Activities for applying research results

We carry out various activities aiming at effective utilization of the results from our researches so that they could be extensively utilized by the public.

1. Standardization

The adoption of technologies originating from Japan as international standards gives rise to new industries and contributes to the growth of Japanese economy. We conduct vigorous and strategic standardization activities at international standardization organizations (e.g. TU-R, IEEE), domestic standardization bodies (e.g. ARIB), and to a variety of forums.

2. Research collaborations

We promote goal-oriented R&D through collaborative/commissioned researches and contracted research with external funds with universities, private companies, and research institutes in Japan and abroad.

3. PR activities

Research results and the progress of our activities are informed to the public by various ways, such as through press release, at website or at events, in order to be widely recognized and to motivate implementation. Our efforts in extensive PR activities include planning and sponsoring symposiums/exhibitions and participating in these events.

4. Technical transfer / Acquisition of intellectual property

We strategically acquire intellectual properties useful to industries, such as patents, programs, databases and knowhow from Japan and abroad. They are aimed to be implemented to society through technical transfer and to contribute to create new industry.

5. Disclosure of research results

Various information on research results, including research papers, oral presentations and awards received, are published in the Research Results Disclosure System on the NICT website for potential application in the private sector.



TV white space database

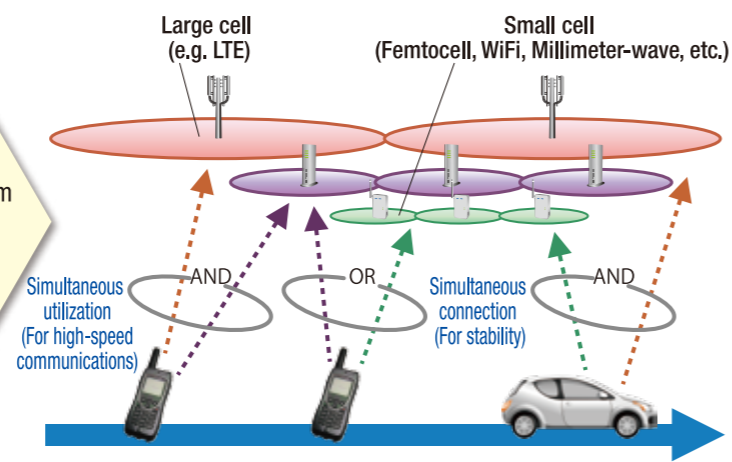
Research outline

The Wireless Systems Laboratory mainly conducts R&D of elemental technologies and system architectures for terrestrial wireless networks, aiming at efficient use of frequencies as well as implementation of safe and secure wireless communications.

Research projects

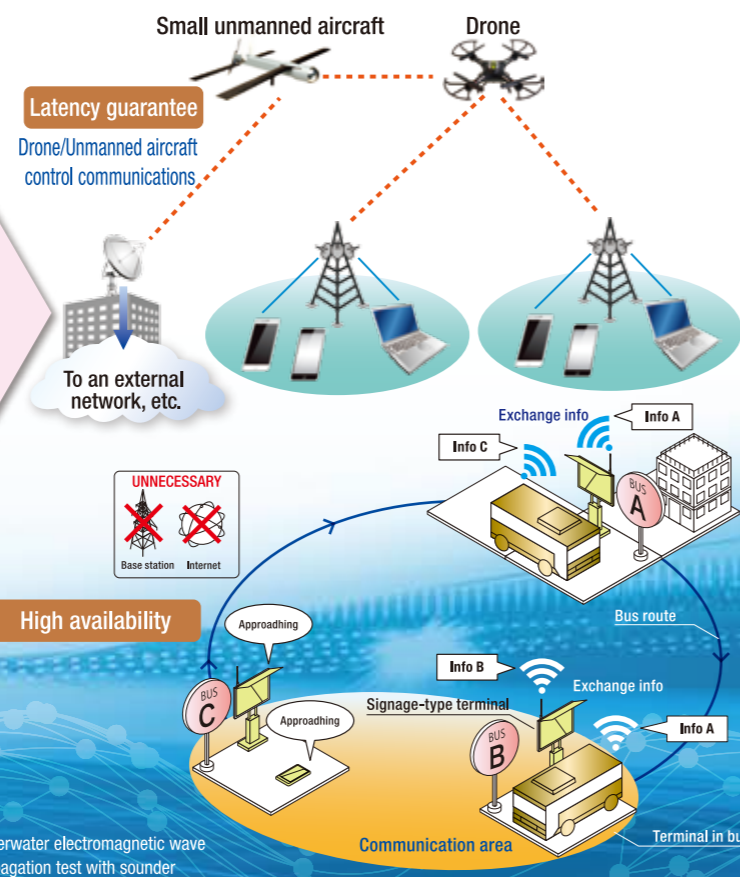
Wireless network management technology (Expansion of existing systems)

In order to contribute to the 5th generation mobile communication system (5G), we carry out R&D on spectrum sharing and traffic dispersion/management technologies. Linkage to the Intelligent Transport Systems (ITS,) radio systems for public safety, and application of high-speed communication technologies using millimeter/terahertz-wave are also under discussion.



Wireless network technologies with enhanced reliability (Expansion of communication environment)

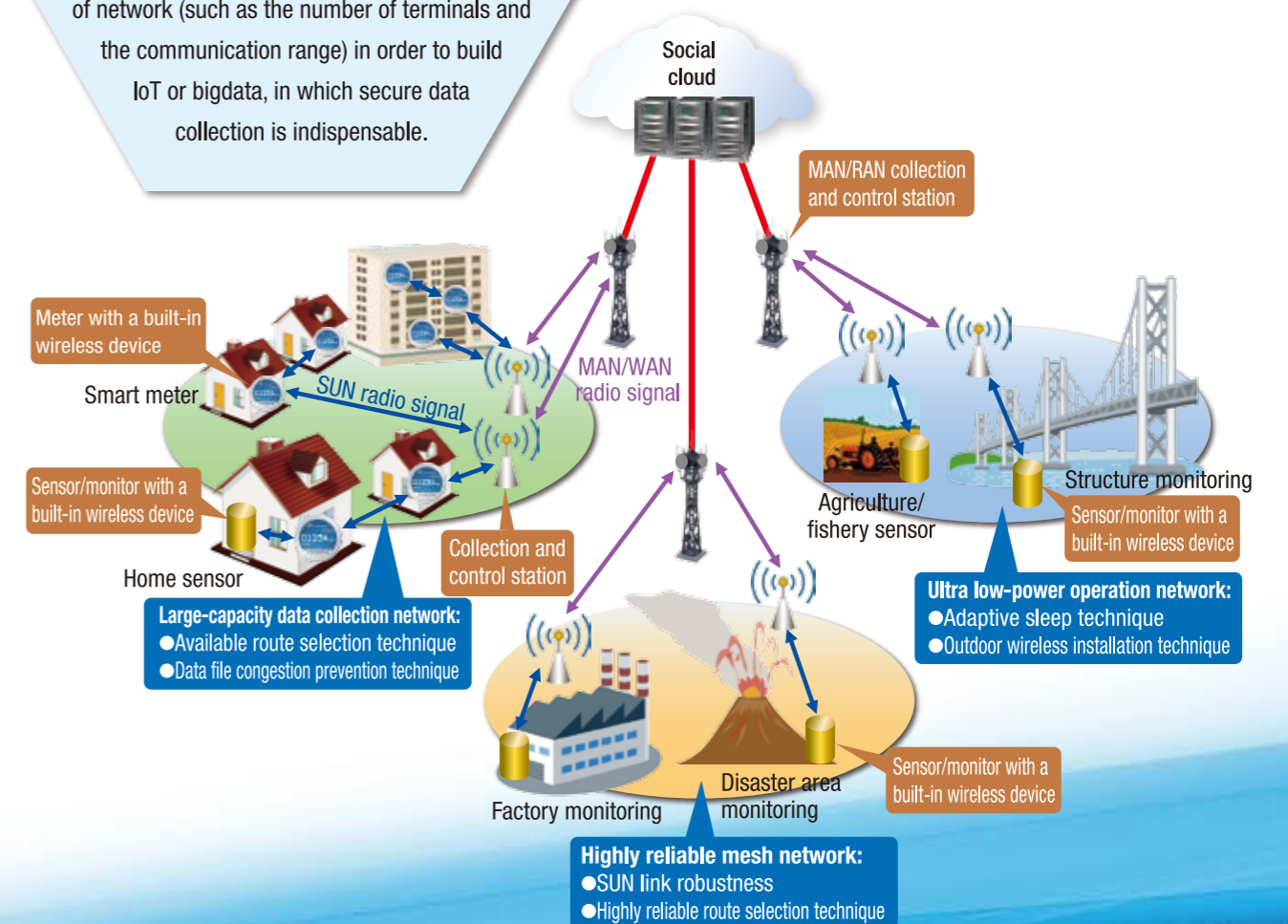
In order to expand application fields of wireless networks, we carry out R&D on radio communications technologies with reliability or availability even in severe situations such as after a disaster or delay-sensitive applications. Also, radio communications under seawater or for implantable devices are under discussion.



Underwater electromagnetic wave propagation test with sounder

Wireless network customization technology (Creation of new systems)

In this project, we study on wireless network customization technologies which enable terminals to function adaptively according to its circumstance by identifying the application environment and the scale of network (such as the number of terminals and the communication range) in order to build IoT or bigdata, in which secure data collection is indispensable.



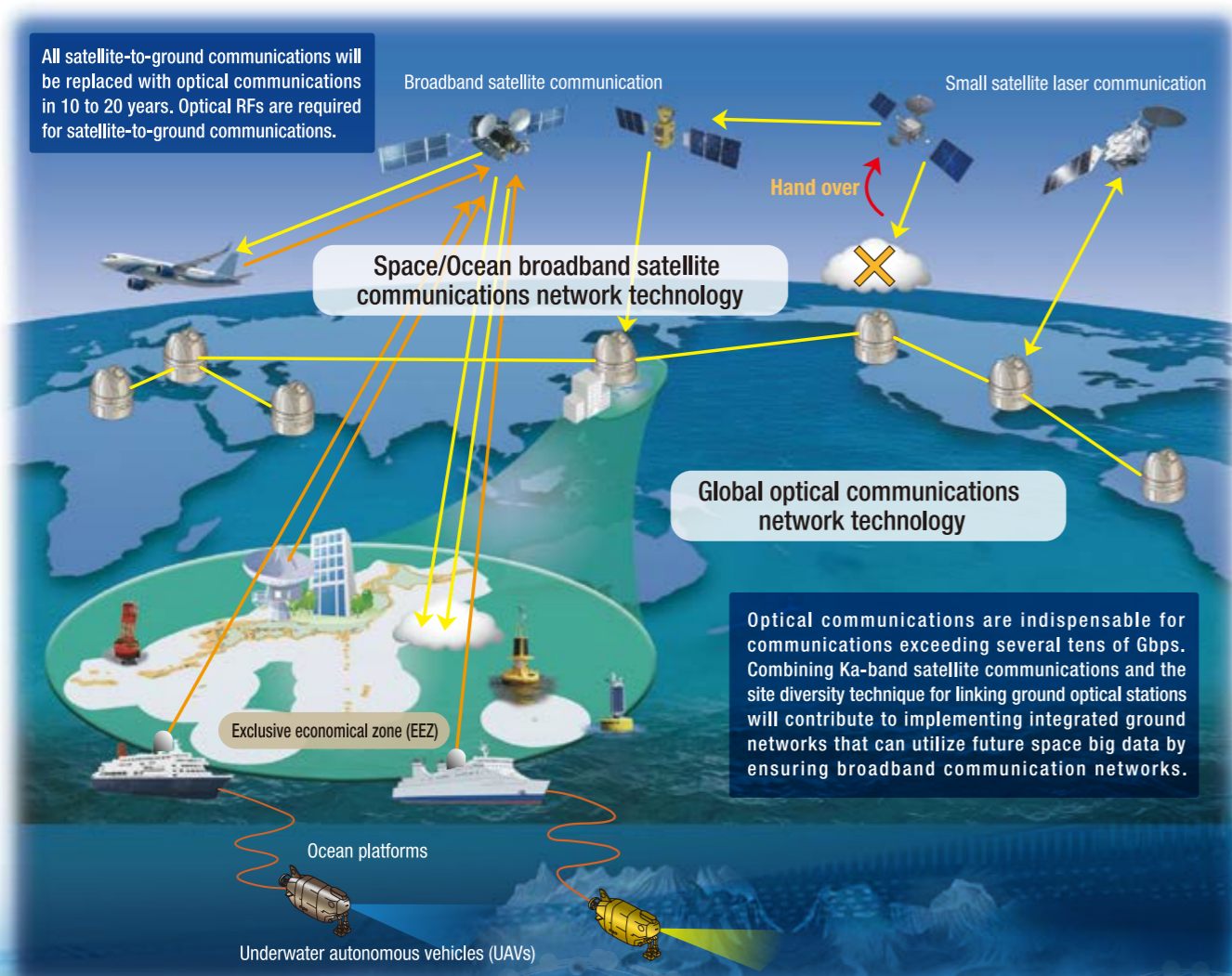
Space Communications Laboratory

Research outline

Almost all space communications are considered to be replaced with optical interorbital communications in 10 to 20 years. In optical communications, a site diversity technique is required for mitigating the effect of weather by linking multiple ground optical stations to ensure broadband communication networks.

The Space Communications Laboratory aims at contributing to the implementation of an integrated space-ground network that enables the use of space big data in future by combining optical interorbital communications and Ka-band satellite communications.

Research projects



Global optical communications network technology

In order to meet the requirement for satellite communications with ultra-large capacity according to improvements in remote sensing and extensive use of aeronautical satellite communications, we conduct R&D on satellite-borne equipment technology, global inter-satellite optical communication network technology and optical communication devices mounted in the next version engineering test satellite.

Space/Ocean broadband satellite communications network technology

With a focus on the next version engineering test satellite, we carry out R&D on technologies enabling broadband networks required on the sea and in airways at Ka-band radio waves, and also technologies for compact and light mobile communication terminals.

Wideband InterNetworking engineering test and Demonstration Satellite (WINDS) Project

In this project, we carry out R&D and demonstration experiments of technologies to achieve high-speed and large-capacity Internet communications through satellite communications.



Small Optical TrAnponder (SOTA) Project

We conduct R&D of an ultra-small optical transponder having a high communication speed for mounting in an ultra-small satellite.



Next-generation ocean resources exploration (Zipangu in the Ocean Program) Project

Participating in the next-generation ocean resource survey technologies (Zipangu in the Ocean Program), part of the "Strategic Innovation Creation Programs (SIPs)" promoted by the Council for Science, Technology and Innovation (CSTI) of the Cabinet Office, we study on technologies for networking survey ship, marine relays and ground base stations in high-speed satellite communications.



Type VIII Engineering Test Satellite "KIKU" (ETS-VIII) Project

It is the R&D of satellite sensor networks using type VIII engineering test satellite for applications such as natural disaster measures and environment monitoring.

