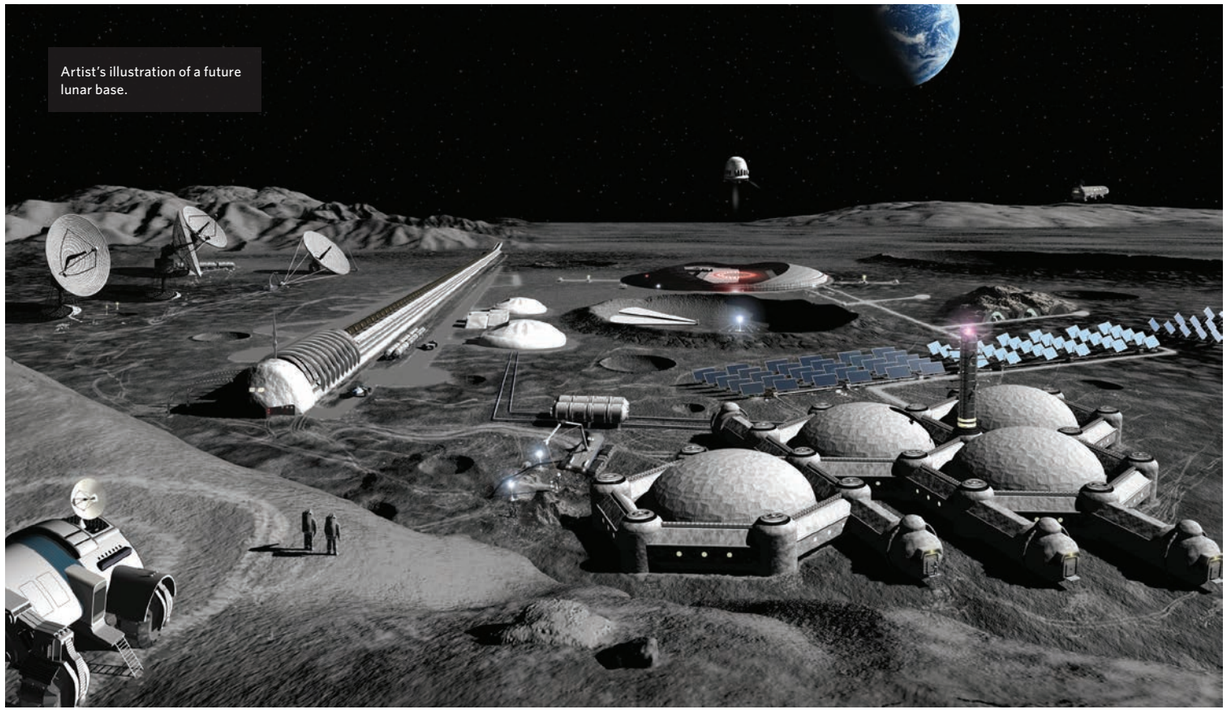
A new commercial space

By involving the nation's private sector, the Japan Aerospace Exploration Agency (JAXA) is PUSHING THE COMMERCIALIZATION OF SPACE SCIENCE AND EXPLORATION.



Artist's illustration of a future lunar base.

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View from Japanese Experiment Module window of the International Space Station.

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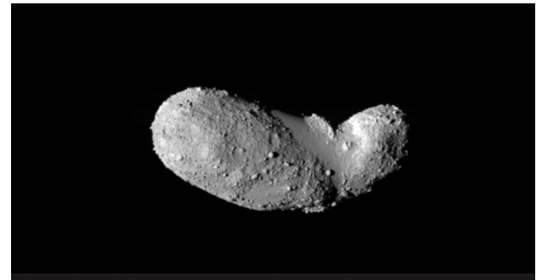

Image of asteroid Itokawa taken by asteroid explorer Hayabusa.

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Japan has a long and illustrious history in space science and exploration, being the fourth country into space with the launch of its Ohsumi satellite in 1970 and the third to send spacecraft to both the Moon and Mars. It has become a major space-faring nation and spends about 350 billion yen (US$3.2 billion) a year on space exploration and development.

Since its establishment in 2003, the Japan Aerospace Exploration Agency (JAXA) has launched more than 30 space missions, including six to transport cargo to the International Space Station. It conducts a broad range of research and development on essential services for modern life, such as telecommunication systems and weather data, as well as performing cutting-edge astronomical observations and space exploration.

NEW DIRECTIONS

Traditionally focused on government-funded activities, Japan's space industry is now looking to increasingly commercialize its space activities. In particular, in line with government policy, JAXA is contributing to expand the development and utilization of space by doubling the size of the Japanese space industry to nearly 2.4 trillion yen (US$22 billion) over the next two decades.

"We have two aims in promoting Japan's space industry," says Naoto Matsuura, director of the New Enterprise Promotion Department at JAXA. "The first is to enhance the competitiveness of the space industry in Japan. The second is to create new partners with a view to expanding Japan's space industry community."

WE ARE EXTENDING JAXA'S EXPERTISE AND EXPERIENCE TO HELP COMPANIES MANAGE THE RESEARCH AND DEVELOPMENT OF SPACE TECHNOLOGY

Reflecting this approach, JAXA has adopted an 'explore to apply' philosophy to stimulate the commercialization of space and has launched a number of industrial support programmes that encourage private-sector participation in the space industry. For example, JAXA has offered joint R&D opportunities between JAXA and private companies for developing new products using JAXA's technologies, and provides up to 10 million yen (US$90,000) per year over one to three years to successful proposals. JAXA gives private companies the opportunity to demonstrate technologies in outer space by offering them the opportunity to put small satellites into orbit using JAXA's H-IIA rocket and to use the Japanese Experiment Module of the International Space Station.

In collaboration with private enterprises, venture capital funds and banks, JAXA will push such commercialization of space development for new-space activities such as space exploration, in-orbit services and big-data analysis.

In 2015, JAXA established the Space Exploration Innovation Hub Center (TansaX) aiming to promote greater collaboration with industry as well as drive the development of technologies that support JAXA's future space exploration programmes and the expansion of the private space industry. It will also promote technologies that will improve life on Earth, such as communications and weather forecasting.

"Through TansaX, we are extending JAXA's expertise and experience to help companies manage the research and development of space technology," explains Hitoshi Kuninaka, the hub's director. "We are working with more than 50 companies, universities and R&D institutions in Japan and bringing much-needed investment to the space industry."

TansaX invites companies to participate in key research areas to expand the space industry. JAXA gains by delegating key technology development activities, while companies benefit from using JAXA's expertise, intellectual property and facilities to develop spin-off products for use on Earth. To encourage spin-offs from JAXA's technologies, the agency established the New Enterprise Promotion Department in 2016 to promote the use of patents and intellectual property licensing for commercial applications.

AIMING FOR THE MOON AND MARS

Over the next 10 to 20 years, Kuninaka expects missions to the Moon and Mars to dominate space exploration. Responding to this challenge, JAXA is working with the Japan Science and Technology Agency to support the construction of an open innovation hub that will focus on extending the humanosphere to other regions of the Solar System.

Projects funded by TansaX include the development of cultivation methods for farming on the Moon, carried out in collaboration with researchers from Tamagawa University and the Panasonic Corporation Eco Solutions Company, and a joint initiative with Sony Corporation to develop a low-powered optical system for long-distance communication, which "could one day be used for communicating between space stations on the Moon and Mars," says Kuninaka.

PROMOTING GLOBAL COOPERATION

In March 2018, Japan will host the Second International Space Exploration Forum (ISEF2) in Tokyo, which will gather government ministers and high-level officials from about 40 countries and organizations to discuss the future of space exploration. The meeting will consider the importance of international cooperation, the potential for future collaboration in advancing space-related business opportunities, and the roles of industry, academia and government in the expansion of space exploration.

"Japan is working to develop global cooperation in space exploration," says Mika Shozaki, director of the Office for Space Utilization Promotion within the Ministry of Education, Culture, Sports, Science and Technology. "And we expect to issue a joint statement at ISEF2 that expresses the common perceptions of participating countries including principles, visions and goals for international space exploration."

In partnership with industry and research institutes, both in Japan and internationally, JAXA is seeking to foster business-oriented partnerships that offer mutual gains for the private sector and future space exploration. ■

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