



UTokyo WAY

2022 - 2023

THE UNIVERSITY OF TOKYO



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UTokyo by the Numbers

Founded in 1877



Academic staff

5,901

As of May 1, 2022

Students

28,027

As of November 1, 2022

International students

4,604

As of November 1, 2022

International staff

759

As of May 1, 2022



Administrative staff

5,589

As of May 1, 2022

Total assets (FY2021)

1,485 billion JPY (10.9 billion USD)

Conversion rate 1 USD = 136.40 JPY, TTM rate on March 1, 2023

Total ordinary revenue (FY2021)

264.1 billion JPY (1.9 billion USD)

Total ordinary expenses (FY2021)

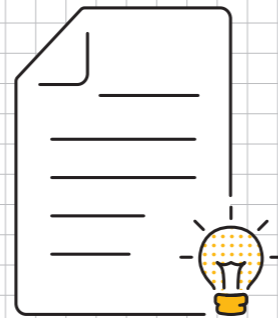
261.9 billion JPY (1.9 billion USD)



Number of

patents obtained

4,744



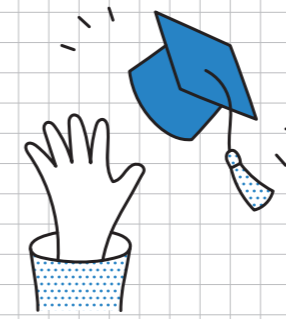
UTokyo-related
startup companies

478

As of March 31, 2022



Total
number
of
graduates



451,653

**Nobel
Prize
Winners**



Faculty and alumni

THE World University
Rankings 2023

39th

Cited papers

536,799

Number of times that UTokyo papers published from 2017 to 2021 were cited by papers indexed in Web of Science during the same five-year period (Source: data from the Essential Science Indicators database, accessed on November 15, 2022)

QS World University
Rankings 2023

23rd

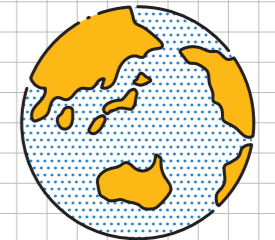


THE World Reputation
Rankings 2022

10th

Overseas facilities
and offices

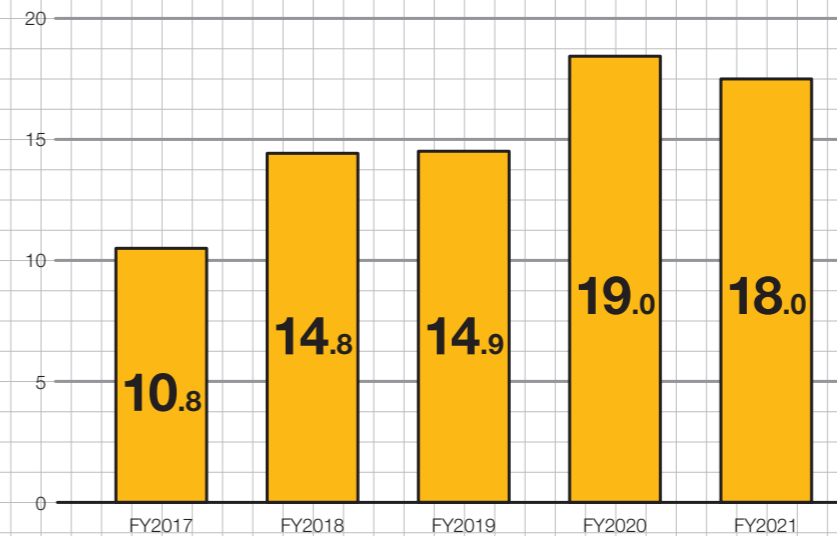
30



UTokyo Foundation balance (FY2021)

18 billion JPY (0.1 billion USD)

Conversion rate 1 USD = 136.40 JPY, TTM rate on March 1, 2023



Exchange of
researchers

1,634

Inbound and outbound

International
exchange agreements

559

Progress in Sustainability

In April 2008, UTokyo launched the University of Tokyo Sustainable Campus Project (TSCP), which was intended to present a model of a future sustainable society from the campus. During its launch, the TSCP announced a reduction target for CO₂ emissions related to energy use. It used fiscal 2006 as the base year and aimed for a 50%

reduction by fiscal 2030 (TSCP2030) (Figure 1). The short-term goal TSCP2012 and medium-term goal TSCP2017 were both achieved. At present, the TSCP aims to meet the goals of the Paris Agreement as the next medium-term goal and is working toward the reduction of emissions by 18% from the FY2017 levels by the end of FY2023 (TSCP2023).

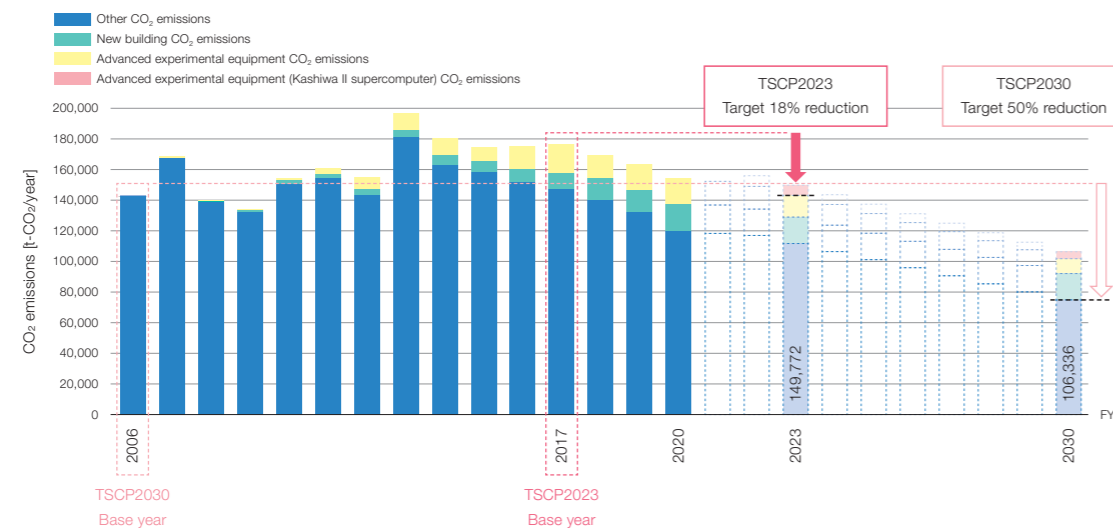


Figure 1. Trends in CO₂ emissions related to energy use at UTokyo and future targets

Figure 2 summarizes the changes in CO₂ emissions related to energy use as an index based on fiscal 2006, excluding cutting-edge experimental equipment. Considering FY2006 as the standard

of 100, the basic unit (floor area) in FY2020 is 71.0 (-29.0%) and the basic unit (ordinary income) is 62.6 (-37.4%).

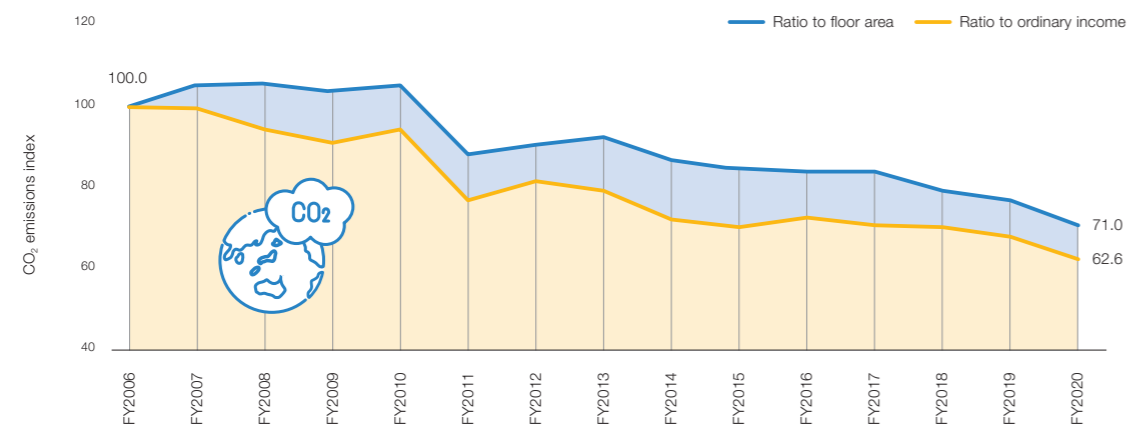


Figure 2. Changes in the CO₂ emissions index related to energy use at UTokyo (excluding cutting-edge experimental facilities)

Forests cover 2/3 of Japan's land area.

0.1% of that forest is owned by the University of Tokyo.

UTokyo has seven regional forests throughout Japan covering a total of about 31,000 hectares. The mission of the University of Tokyo Forests, an affiliated facility of the Graduate School of Agricultural and Life Sciences, is to create and maintain forests that link science to society. Taking

advantage of over a century of long-term data as well as education and research conducted in cooperation with local communities, the Forests contribute to the University of Tokyo's efforts toward Green Transformation (GX) through research on sustainable timber production and other activities.

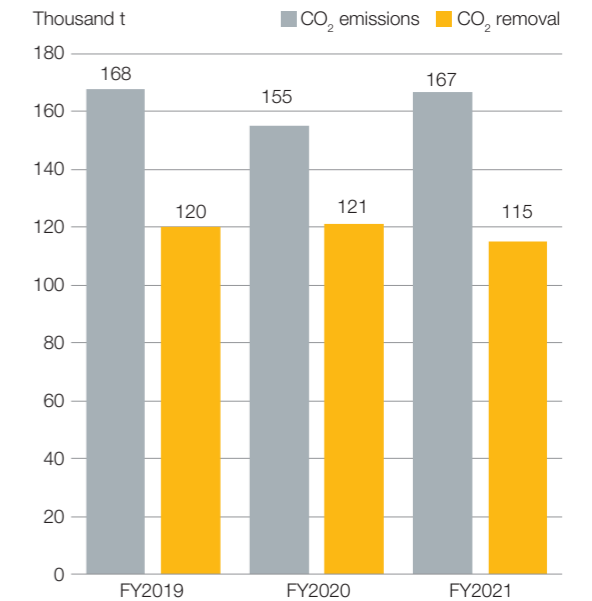


Figure 3. Emissions related to energy use at UTokyo and removal by forests owned by UTokyo

Forest name	Year established	Forest area [ha]	Altitude [m]	Climate zone
The University of Tokyo Chiba Forest	1894	2,160	50 – 370	Warm-temperate zone
The University of Tokyo Hokkaido Forest	1899	21,863	190 – 1,459	Cool-temperate and subarctic zones
The University of Tokyo Chichibu Forest	1916	5,726	530 – 1,990	Cool-temperate zone
The University of Tokyo Tanashi Forest	1929	7	60	Warm-temperate zone
Ecohydrology Research Institute	1922	1,252	2 – 692	Warm-temperate zone
Fuji Iyashinomori Woodland Study Center	1925	37	990 – 1,060	Cool-temperate zone
Arboricultural Research Institute	1943	214	10 – 520	Cool-temperate zone
Total		31,259		

1

President's Message





President's Message

Teruo Fujii

President
The University of Tokyo (UTokyo)



We live in a time in which humanity confronts many serious and pressing global challenges. Those challenges include the COVID-19 pandemic, climate change, global divisions, and social inequality, as well as seemingly intractable problems such as the military invasion of Ukraine by Russia in February 2022 and the ongoing economic, political, and social turmoil around the world. Because the conditions and assumptions that we have taken for granted are changing so drastically, those of us in academia must maintain a clear understanding of the mission of the university and possess a comprehensive vision that stretches from the past into the future as we continue to strive to create new knowledge.

That understanding and vision are the foundation for UTokyo Compass, the statement of our university's guiding principles that we announced in October 2021. As we declared then, the University of Tokyo has been given a mission by society to nurture talented individuals who can actively tackle the profound challenges facing humanity.

I have often emphasized the importance of reconnecting learning to society. Today, with social frameworks changing rapidly, specialized learning in the classroom is not enough to create leaders who can raise original questions, integrate different kinds of knowledge, tackle diverse social issues, and work together with others to build a better future. That is why the University of Tokyo focuses on providing our students with opportunities to engage directly with people throughout society and to gain knowledge through that experience.

A key part of our efforts is support for entrepreneurship. Conceiving and building new enterprises requires the ability to tackle problems persistently, come up with new ideas for solutions, and cooperate with others to make those ideas a reality. Practicing entrepreneurship is also linked to the importance of "care," which involves perceiving the various needs and wants that exist in society and responding to them appropriately. That is why the University of Tokyo emphasizes education that reconnects learning with society. We encourage the younger generation, who will be responsible for the future of our society, to seek solutions to the global challenges that their generation will face, to serve the public interest

through social entrepreneurship, and to launch startups that can play an active role on the world stage.

The University of Tokyo uses the term "management capacity" to describe our university's ability to implement the initiatives necessary to achieve our mission of serving the public and strengthening the foundation for learning. The first step in boosting our management capacity has been to devise a new model for what a university like ours can be. As a national university corporation, the University of Tokyo has been largely dependent on government funding, which comes with many conditions and restrictions. As leading universities in other countries have shown, universities can accomplish more when they also have sufficient funds to spend at their own discretion. One step to increase our discretionary resources has been to begin issuing university bonds.

An excellent example of what an institution with sufficient financial independence can accomplish has been shown by Oxford University. Immediately after the genetic sequence for the Wuhan virus was released in January 2020, Oxford gave the go-ahead to develop a new vaccine. In collaboration with AstraZeneca, its researchers succeeded in developing a vaccine that was soon released under a not-for-profit licensing agreement. That success clearly demonstrated the need for a university like ours to have autonomous funding and management. With our management capacity strengthened, our goal is to provide even greater value through our education and research and thus earn the recognition and support of society, creating a positive cycle of trust that leads to even more creative activities.

In 2027, the University of Tokyo will celebrate our 150th anniversary. We have many exciting actions planned in order to vigorously advance our "way" of being a university that serves the public good worldwide. This "UTokyo WAY" was created to share what we have been doing with as many people as possible and to tell them about the future to which we aspire. After you have read it, we hope that you will engage in dialogue with us. We want to work together with you to create a more prosperous and sustainable society for the future that we all share.

The University of Tokyo Future Society Creation Model

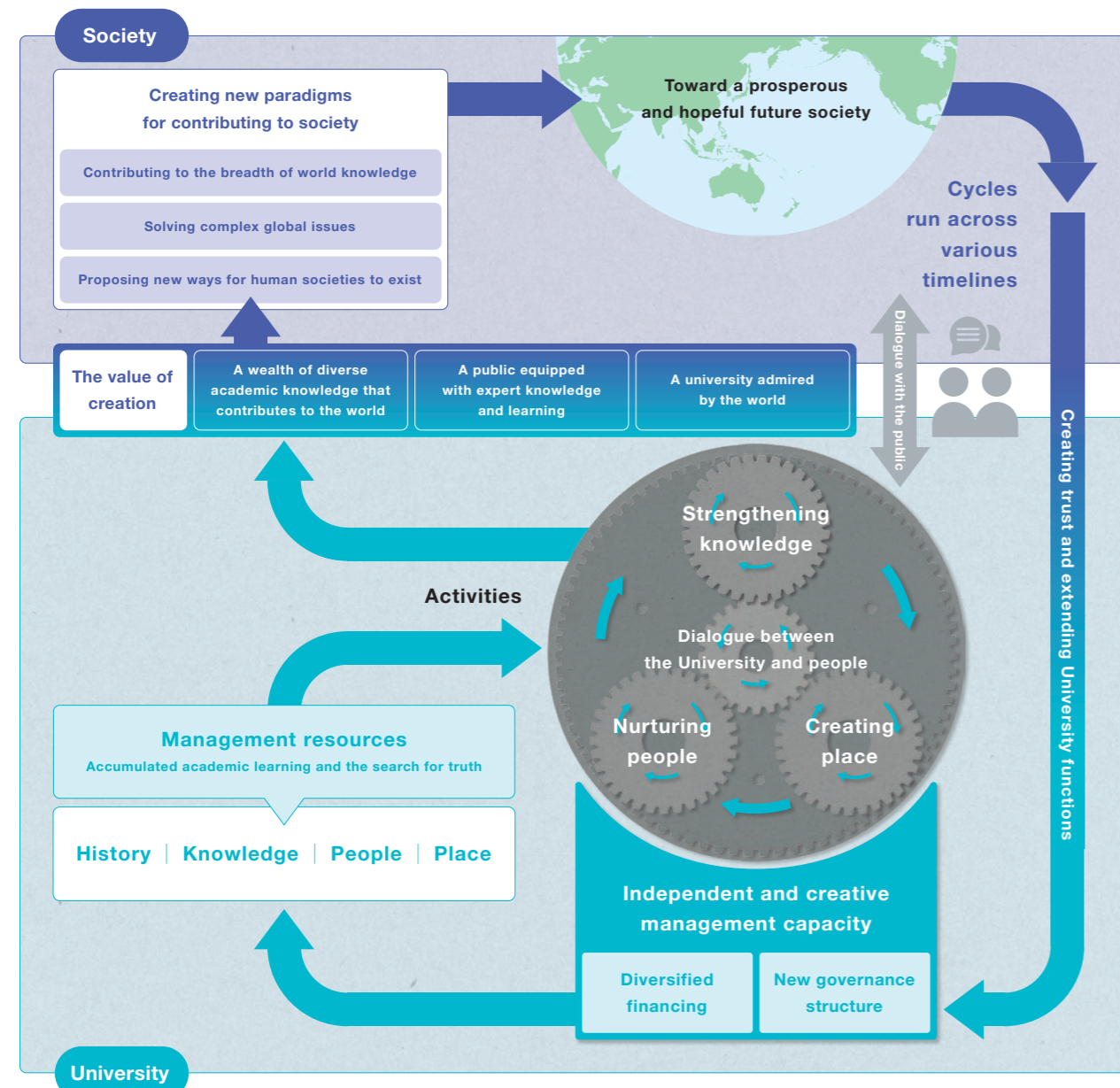
The diagram below represents the missions of the University of Tokyo and the process it has been following to create value in its interactions with society.

The elements are all interconnected, and the cycles extend from the short and medium term to the long and very long term.

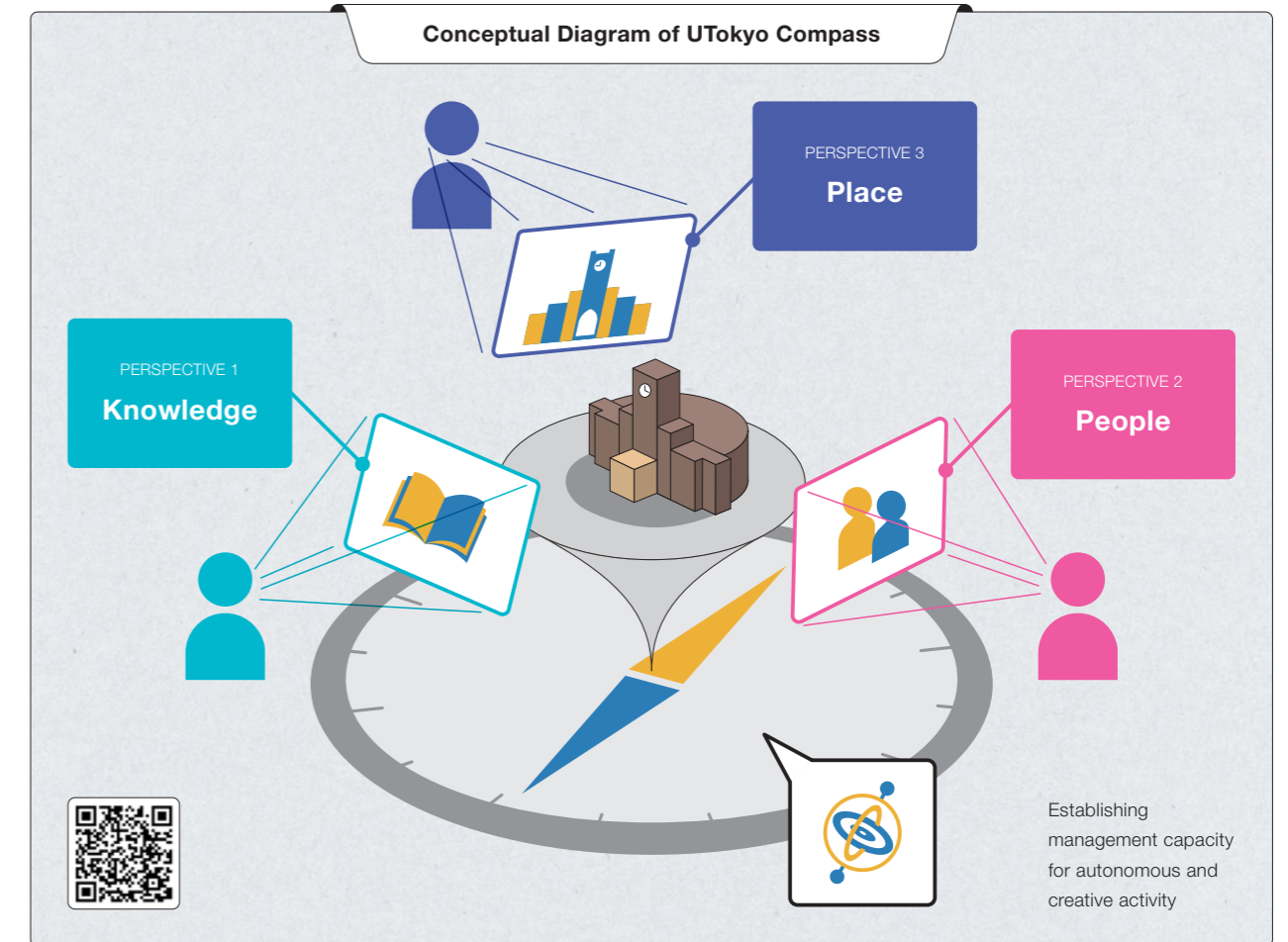
The gears represent what we do. Value is created through activities centered on the multifaceted 3 Perspectives of UTokyo Compass — strengthening knowledge, nurturing people, and creating place (see next page). In all of these activities, we emphasize dialogue among members of the University community and with the wider society.

Initiatives undertaken by the University have broad impacts on society and social capital. The proposals we make for a prosperous and hopeful future society seek to transform how society functions, as well as to contribute to the diversity of knowledge and to the solution of complex global issues. Some examples of our initiatives are described beginning on page 14.

By creating value and earning support from society through our activities, the University of Tokyo both receives support from and gives back to society. As an institution committed to serving the global public, we will continue to promote this virtuous cycle in the years ahead.



A Future-Oriented Investment Strategy Inspired and Guided by UTokyo Compass



Establishing Management Capacity for Autonomous and Creative Activity

1. Develop an autonomous and creative university model
2. Formulate a sustainable management strategy and expand the functions of the university
3. Cultivate support and appreciation for the university's roles

Knowledge

4. Seek solutions to global problems
5. Promote diverse scholarship
6. Generate excellent academic knowledge
7. Generate value through co-creation with industry
8. Promote responsible research

People

9. Nurture inclusiveness and capacity for creative dialogue
10. Nurture an international outlook

11. Undergraduate education: Cultivate disciplinary expertise, wide-ranging knowledge, and high ethical standards
12. Graduate education: Cultivate advanced disciplinary expertise and practical capabilities to tackle next-generation problems
13. Support early-career researchers
14. Cultivate administrative staff with advanced expertise and a creative mindset
15. Connect the university and society through bidirectional recurrent education

Place

16. Create a supportive and empowering campus that anyone in the world would want to join
17. Support education and research activities
18. Expand the campus in cyberspace
19. Extend our place into wider society
20. Extend our place internationally

2

Value Creation



Taking On the Challenge of Global System Change

International Achievements of the Center for Global Commons

Global warming and the degradation of biodiversity and ecosystems – the effects of which are becoming increasingly evident – are causing progressively greater difficulties for human society. Drastically reducing the burden that we place on the environment and protecting earth system stability will require us to make fundamental changes in the major economic systems that govern our energy, food, production and consumption, and cities.

The University of Tokyo established the Center for Global Commons (CGC) in 2020 to contribute to overcoming these challenges. Ever since, the CGC has been working on and advocating a strategic framework and actions to transform the socio-economic systems necessary for protection of the Global Commons, together with various partners from business, finance, governments, and international organizations.

In 2021, the CGC – together with the UN Sustainable Development Solutions Network (SDSN) and Yale University – released the Global Commons Stewardship

Index (GCSI: an index of each country's environmental impact, both domestically and internationally), which clearly showed that consumption in developed countries is placing a particularly heavy burden on the planet.

Later, in May 2022, the CGC, SYSTEMIQ (UK), the Potsdam Institute for Climate Impact Research (Germany), and the SDSN jointly released the Global Commons Stewardship Framework, which presents a practical scientific framework for responsible management of the Global Commons and which has been endorsed by many international organizations and international entrepreneurs.



The research findings published by the CGC to date in cooperation with various international agencies and others are available in full on the CGC website.

Practical Application of Global Commons Stewardship through Collaboration with Industry

Together with thirteen Japanese companies, the CGC established the Energy Transition Initiative – Center for Global Commons (ETI-CGC), a platform for industry-academia collaboration, to discuss pathways and policies for Japan to achieve decarbonization. The ETI-CGC was announced on November 5, 2021, at the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP26) in Glasgow, UK. Since then, the ETI-CGC has been discussing with leaders of participating companies, making extensive use of the University of Tokyo's academic knowledge and resources, on the topics of Japan's energy transition strategy toward decarbonization by 2050, and its closely associated 2050 future vision strategy, including the industrial structures and lifestyle changes.

In November 2022, the CGC was also well received at COP27, held in Egypt, where CGC representatives demonstrated crucial insights, including the need for renewable energy and hydrogen, through an interim

analysis of the decarbonization scenario of Japan's 2050 energy system, and held discussions with participating companies and international leaders on the challenges and actions needed to achieve decarbonization.

The CGC will continue research and practice to deal with the global issues facing humanity in collaboration with leaders from various areas across academic disciplines and businesses as well as beyond borders.



CGC Director Naoko Ishii (far left) speaks at a COP27 event.

Fostering Advanced Human Resources to Lead Green Transformation (GX)

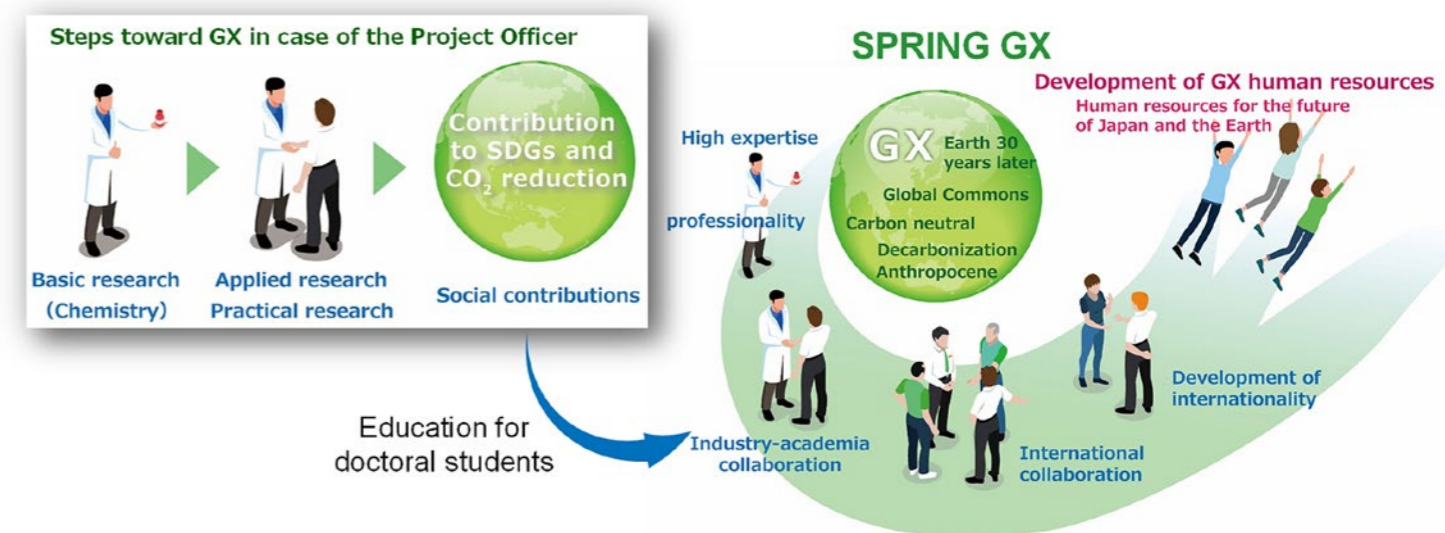
In 2021, the University of Tokyo launched SPRING GX, a program for doctoral students, with the aim of training personnel to lead the Green Transformation (GX) of society on a large scale in all fields. This program was adopted by the Japan Science and Technology Agency (JST) under the Support for Pioneering Research Initiated by Next Generation (SPRING) program. With 600 doctoral students – 10% of those supported by this JST program – the University's SPRING GX is the largest of the 59 SPRING projects.

The project positions GX as a form of social transformation for better management of the global environment, an asset shared by all of humankind that must be passed on to future generations. It supports science and engineering departments that address science and technology-related fields as well as all other academic fields that relate to human activities, including legislation, philosophy, the humanities, and other social sciences. The program also provides financial support exceeding 2.5 million yen per student annually to enable each and

every student in the program to engage in challenging and emergent research, based on their curiosity. Through a diverse array of options, including GX-related lectures and industry-academia collaboration internships, the program fosters highly transferable skills that are applicable in any industry or occupation in society.



SPRING GX, The University of Tokyo (YouTube)

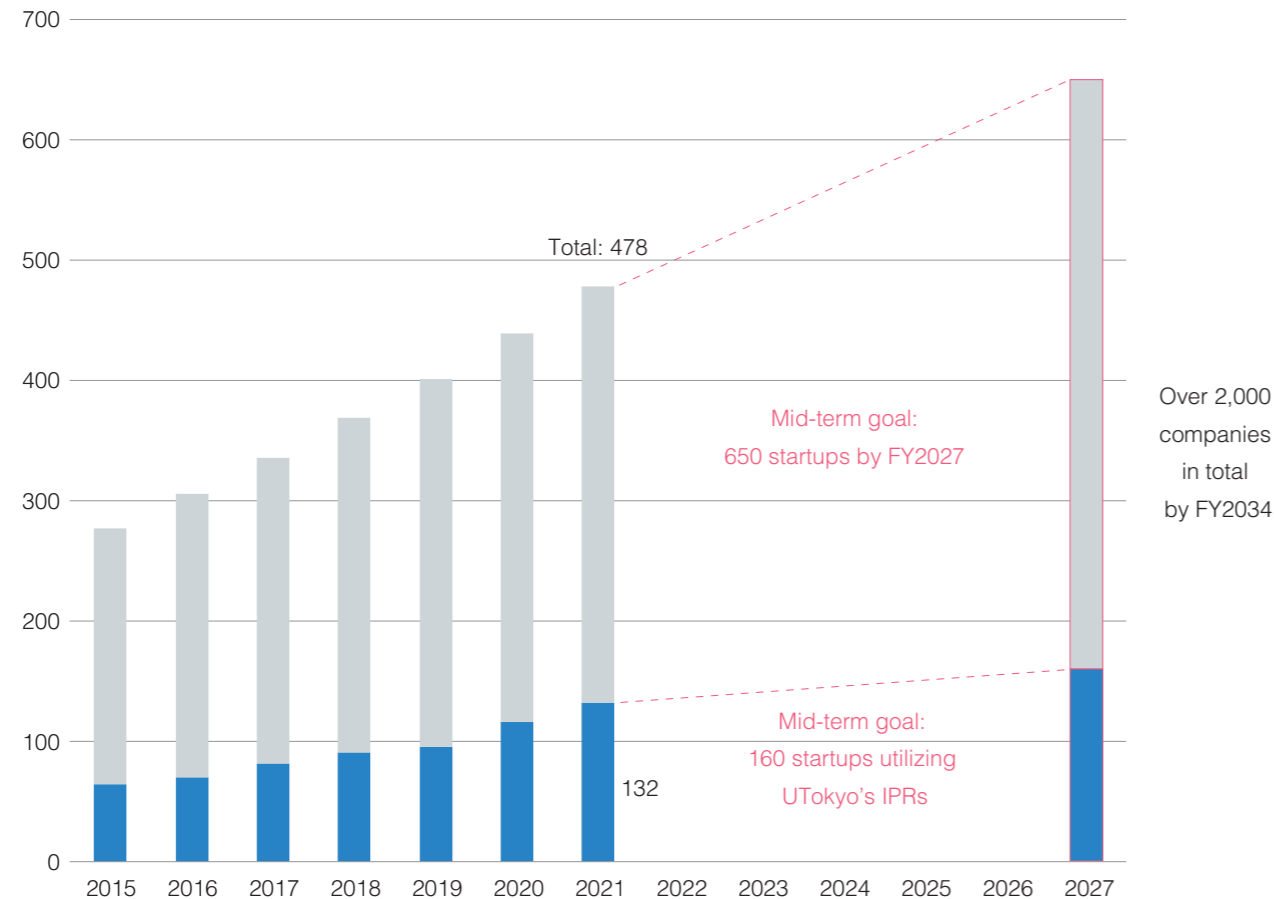


A Startup Ecosystem with a View to Global Growth

For many years, the University of Tokyo has actively provided support and training for University-related startups, including entrepreneur education, training for innovation professionals, and incubation facility operations. Startup companies related to the University possess the scientific knowledge and advanced technological development capabilities that are the driving force behind solutions to society's issues, and are filled with flexible ideas that can lead to innovation. The number of students and early-career researchers with an interest in launching startups and playing an active role in finding solutions to society's issues through the University's entrepreneur education programs is also growing. Currently, the University of Tokyo produces an average of 30 University-related startups each year and boasts the largest total number of startups, 478 companies, of any Japanese university. Within 10 years, the University of Tokyo aims to increase the number of supported startups, including

companies expanding internationally, by about tenfold. The University of Tokyo is now also considering setting up a new fund to drive dramatic growth. To date, the University has used the UTokyo Innovation Platform Co., Ltd., an investment company, to manage two funds that have enjoyed solid success in developing a startup ecosystem at the University. The third fund's angle would be global, a hot topic for the University. Intending it to serve as a guide for graduates who launch businesses overseas, but also with overseas investors in mind, the University is considering a fund worth 60 billion yen. The University's efforts to provide wide-ranging entrepreneurial support also include assistance with commercializing the results of research, including in the area of Deep Tech, as well as support for non-profit-oriented social entrepreneurs.

Intellectual Property Report 2022



Cumulative total of UTokyo-related startups

UTokyo Startup BionicM Inc.: Creating a World Where Everyone Is Freer to Move About

BionicM Inc. is working to commercialize a robotic powered prosthetic leg that uses sensors to detect the user's unconscious movements and provide motorized assistance, resembling closer than ever before the natural movement of a human leg. Established in 2018, BionicM is a UTokyo startup that was created with support from UTokyo Innovation Platform, a wholly owned investment company of the University of Tokyo. In 2021, BionicM launched Bio Leg, a robotic prosthetic leg, in both Japan and China, making it the first Japanese manufacturer to enter the prosthetic leg market, which has been dominated by Western manufacturers.

"I intend to dedicate my life to prosthetic legs and create something the world has never seen before," says BionicM's passionate founder and CEO, Xiaojun SUN, himself a prosthetic-leg user. He first encountered prosthetic legs as an international student in Japan, and he began researching and developing a powered prosthetic leg in graduate school at the University of Tokyo. Today, he is based at the Entrepreneur Plaza, the University of Tokyo incubation facility on the Hongo Campus, where he is making full use of the University's various startup support programs while also successfully raising large amounts of funding. With the mission of "Powering Mobility for All," he has focused on developing more



Bio Leg product launch in Beijing, China, October 2021. CEO Xiaojun Sun is third from the left in the photo.

advanced technologies and expanding his company's business to overseas markets.

Diversity and inclusion are the wellspring of innovation. Every year, the number of international students who, like CEO Sun, arrive from abroad to study at the University of Tokyo has continued to grow. In 2022-2023, more than 4,600 such students were enrolled at the University. The University has also established an entrepreneurship training program, conducted in English, to provide international students with entrepreneurial opportunities. For more information, visit the website of the Department of Technology Management for Innovation, Graduate School of Engineering (tmi.t.u-tokyo.ac.jp).

Website of BionicM



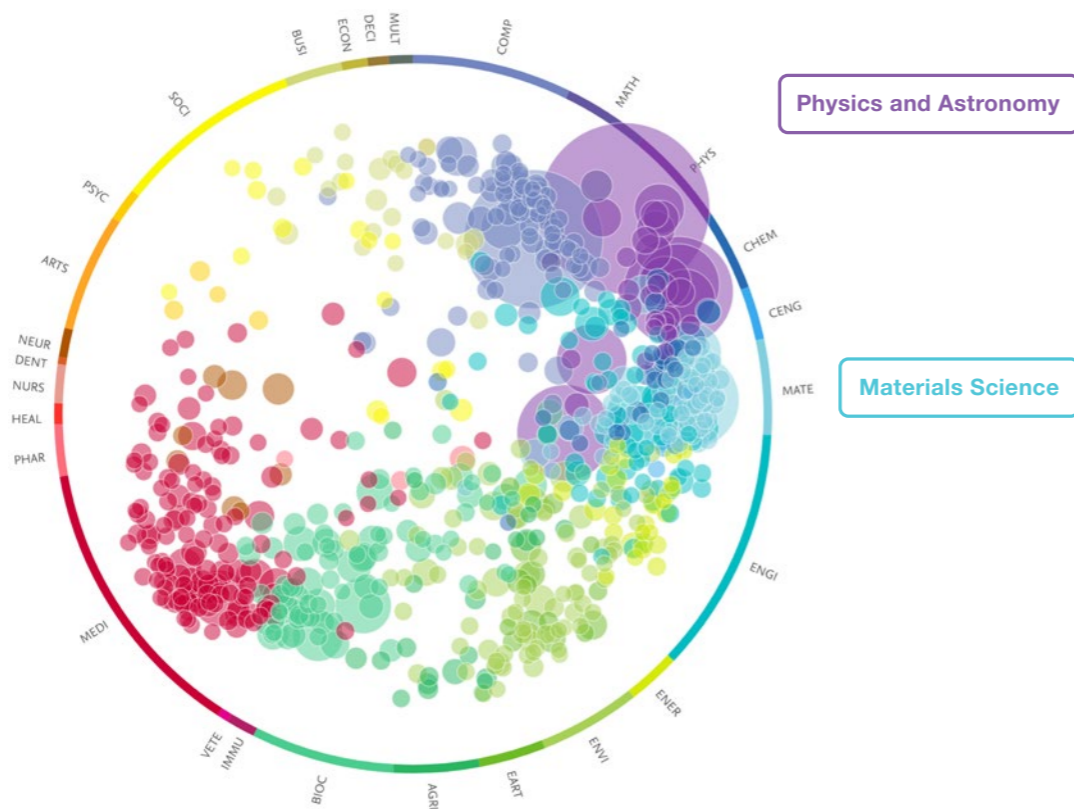
Resources of Value Creation — Knowledge

A Century and a Half of Diversity and Excellence in Learning

Academic Diversity

In its nearly 150-year history, the University of Tokyo has consistently delivered outstanding education across diverse academic disciplines. An analysis of academic papers published at the University of Tokyo between 2017 and 2021 against the nearly 96,000 topics of research categorized by the research networking tool SciVal shows

that research has been conducted on some 15,454 topics, revealing just how diverse it is. The figure below maps for each research topic the top 1% in terms of impact based on citations and appearances in primarily English-language articles onto related fields of research. This demonstrates the level of excellence at the University of Tokyo, where so much cutting-edge research is performed, and the diversity of its academic disciplines in English-language articles.



Biochemistry, Genetics, and Molecular Biology

The mapping shows high-impact research topics (small inner circles) against the entire field of research (big outer circle). The closer to the center of the circle, the more interdisciplinary the research area is considered to be. Additionally, looking at the size of each research topic based on the number of papers published, the University of Tokyo is particularly strong in the fields of physics and astronomy, materials science, and molecular biology. (SciVal data updated Feb. 8, 2023; based on papers from 2017 to 2021)

- COMP Computer Science
- MATH Mathematics
- PHYS Physics and Astronomy
- CHEM Chemistry
- CENG Chemical Engineering
- MATE Materials Science
- ENGI Engineering
- ENER Energy
- ENVI Environmental Science
- EART Earth and Planetary Sciences
- AGRI Agricultural and Biological Sciences
- BIOC Biochemistry, Genetics, and Molecular Biology
- IMMUN Immunology and Microbiology
- VETE Veterinary
- MEDI Medicine
- PHAR Pharmacology, Toxicology, and Pharmaceutics
- HEAL Health Professions
- NURS Nursing
- DENT Dentistry
- NEUR Neuroscience
- ARTS Arts and Humanities
- PSYC Psychology
- SOCI Social Sciences
- BUSI Business, Management, and Accounting
- ECON Economics, Econometrics, and Finance
- DECI Decision Sciences
- MULT Multidisciplinary



Credit: Earthquake Research Institute Library, The University of Tokyo

Much research and education at the University of Tokyo is conducted in Japanese and other non-English languages. We will continue to respect the bodies of scholarly knowledge and the academic cultures specific to individual language groups, while encouraging the further development of academic activities including those in the humanities and social sciences.

Building Academic Excellence

By further strengthening itself as a world-class center of excellence in research and creating a connected hub of knowledge, the University of Tokyo aims to advance first-tier research globally and create new knowledge modeled on collaborative interdisciplinary innovation.

The University of Tokyo Atacama Observatory (TAO) is a project that aims to have the world's most advanced infrared telescope, with a 6.5-meter aperture, at the peak of Mount Chanantar in the Atacama Desert of northern Chile, making it the highest telescope in the world at 5,640 meters above sea level. The goal is to generate research findings in such fields as astronomy, planetary science, and astrophysics, with a focus on elucidating the two great mysteries of astronomy: the origin of the universe

and galaxies, and the origin of the planets. It is also hoped that the project will broadly help to train professionals and the next generation of leaders by including students in the development of cutting-edge science and technology.

The University of Tokyo also launched the Collaborative Research Organizations system in 2016 to advance interdisciplinarity in various forms with support for interdisciplinary integration and cross-organizational activities.

For instance, the Collaborative Research Organization for Historical Materials on Earthquakes and Volcanoes was created jointly by the Earthquake Research Institute and the Historiographical Institute. In this interdisciplinary research organization, historians and seismologists work together to advance the development of new research methods that integrate the humanities and sciences and to collect, compile, and analyze historical documents in an effort to build and publish a scientific database that can provide long-term information on seismic and volcanic activities in Japan. It is hoped that the findings will not merely be shared with universities and research institutes nationwide but also prove useful for the long-term forecasting of earthquakes and volcanic eruptions, which would be invaluable for society.

Resources of Value Creation — People

Human Resources Tackling Proactively the Major Challenges Facing Humanity

At the University of Tokyo, a diverse range of researchers are engaged in research projects that will lead to achieving the 17 SDGs, in line with its mission as a university that serves the global public.

Development of UV-LED Water Purification Equipment to Improve Access to Safe Water

Small-scale decentralized water supply systems have the potential to be more effective than large-scale centralized water services for people facing an urgent need to secure safe water, such as in developing countries with no water supply system, leaving residents with no choice but to use ground or river water suspected of contamination, in emerging countries where water supply services cannot keep up with the rapid pace of urbanization and population concentration, in depopulated villages where population decline makes it difficult to maintain and upgrade water supply facilities, and in evacuation centers and temporary housing during disasters. Kumiko OGUMA (Associate Professor, Graduate School of Engineering) has developed a device equipped with a compact, mercury-free ultraviolet

light-emitting diode (UV-LED) that purifies water at the point of use, such as a faucet, and experiments to verify the device's efficacy are under way in various locations. Concurrently, she also conducts local surveys of water use and water quality in developing countries and works with local communities to understand their water purification equipment needs. She aims to provide safe drinking water to those left behind by conventional large-scale infrastructure water services and to reduce disparities in water access.

Kumiko OGUMA
Associate Professor, Graduate School of Engineering



The One Health Approach to Neglected Tropical Diseases

Chizu SANJOBA (Assistant Professor, Graduate School of Agricultural and Life Sciences) is an expert on leishmaniasis, a neglected tropical disease (NTD). NTDs cause serious health problems for more than a billion people in 149 countries worldwide, especially in developing countries where the diseases present a major barrier to economic development.

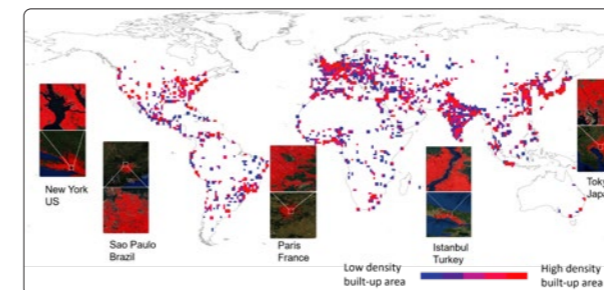
development, the University of Tokyo also contributes to controlling the spread of NTDs and realizing a sustainable society through the development and implementation of new testing technologies, as well as by working to construct a NTD early warning system by clarifying disease transmission cycles based on precise scientific evidence and sharing this information with the world.

Effectively combating NTDs requires the One Health Approach, which encompasses not only humans but also the animals and environments surrounding them. In addition to advancements in drug discovery and vaccine

Chizu SANJOBA
Assistant Professor, Graduate School of Agricultural and Life Sciences



Research and Development of Spatial Information Mapping Tools and Training Programs to Support the EpiNurse Project



Hiroyuki MIYAZAKI (Project Assistant Professor, Center for Spatial Information Science) researches methods of monitoring regional socioeconomic and disaster response capabilities using satellite earth observation and satellite positioning and works internationally to train non-experts in how to make use of these methods. For example, by supporting the development of mapping tools and training programs that utilize the satellite positioning and communication functions of smartphones through the EpiNurse Project in Nepal, he has constructed a platform that enables nurses to easily share information on the health status of local residents and the medical assistance they need, thus helping the local nurses who use these tools to work more effectively.



Hiroyuki MIYAZAKI
Project Assistant Professor, Center for Spatial Information Science



Resources of Value Creation — Place

The Worldwide Spread of Research and Activity Centers

The mission of the University of Tokyo, as a university open to the world and engaged in pioneering research and education, is to contribute to the future of Japan and the world for the sake of future generations, and to extend those activities to the world.

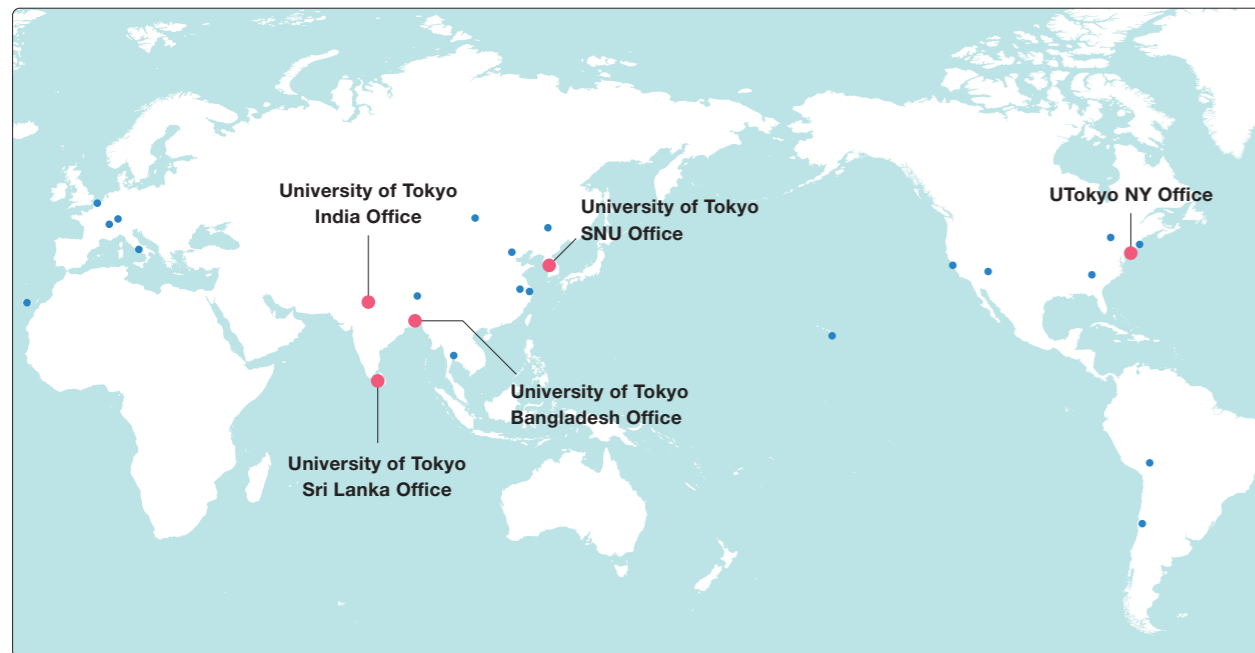
Across the four regions of Asia, Latin America, North America, and Europe, the University has established more than 30 research and activity centers in 15 countries (as of May 2022).

The University of Tokyo has opened overseas offices in five cities — New Delhi, India; Seoul, Korea; Colombo, Sri Lanka; Dhaka, Bangladesh; and New York, U.S.A. — to share information about the University’s education and research activities (● on map below). Located in the heart of New York City, the UTokyo NY Office is especially well situated as a center of exchange among a diverse range of stakeholders, including alumni, international students, donors, and overseas research collaborators. It hosts various events and symposia to share the University of Tokyo’s achievements in research and education and for donor activities.

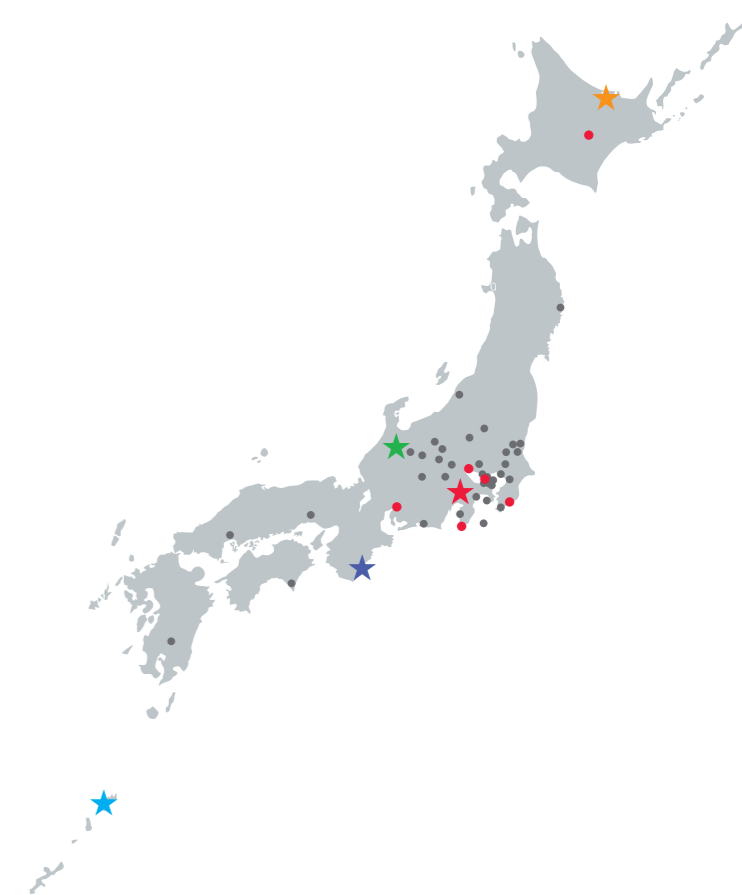
The Japan Studio Symposium was held at the UTokyo NY Office in January 2023. The Japan Studio is a graduate-level design practice studio in which students enrolled at



participating domestic and overseas universities make architectural and urban-scale proposals for sites in Japan. Centered on Princeton University, the event has been joined by institutions such as the University of Pennsylvania and Tsinghua University, while the University of Tokyo has been represented by the Sekisui House - Kuma Lab, where University Professor Kengo KUMA and his colleagues serve as advisors and Project Lecturer Toshiki HIRANO serves as director. The symposium provided an opportunity to present Japan Studio’s activities, reflect on how Japan has contributed to the development of advanced architectural design thinking in international architectural education, and discuss future prospects.



Practicum being conducted at the Fuji Iyashinomori Woodland Study Center, the University of Tokyo Forests, a vast training forest with a history of nearly 100 years (★)



Education and Research Hubs Across Japan Beyond the Main Campuses

The University of Tokyo conducts research and educational activities at three campuses: the Hongo Campus (Bunkyo City, Tokyo), Komaba Campus (Meguro City, Tokyo), and Kashiwa Campus (Kashiwa City, Chiba Prefecture). The University also makes use of other research hubs and training facilities where personnel engage in educational and research activities that are deeply rooted in the local regions and communities, located as far north as Kitami City, Hokkaido (★ on map) and as far south as Amami Oshima Island, Kagoshima Prefecture (★), which is registered as a World Natural Heritage Site.

These hubs and training centers cover a total area of approx. 32,600 ha, which is equivalent to 0.1% of all the land in Japan. The University of Tokyo Forests, Graduate School of Agricultural and Life Sciences, which was established to provide a venue for forest-related education and research, account for most of this land area (● and ★). These university forests have been established in seven locations — Chiba, Hokkaido, Chichibu, Tanashi, Aichi, Fuji, and Izu — and are used by the University as well as by a wide range of other domestic and international educational and research institutions as field sites for student training and a diverse range of research projects. These university forests are also expected to play a role in recharging water sources and absorbing CO₂, thus contributing to the local regions.



The Tokoro Research Laboratory in the Graduate School of Humanities and Sociology conducts education and research with a focus on archaeology. The photograph shows a pit dwelling that was restored based on research findings (★).



The Amami Laboratory of Injurious Animals in the Institute of Medical Science conducts research to combat infectious diseases, such as those endemic in tropical and subtropical regions (★).

Financial Management Reforms Aimed at Creating a New University Model

Ambidexterity: The Versatile Approach of the University of Tokyo

Ambidexterity is an approach to management that strives to balance meeting the needs of today with preparing for the challenges of tomorrow. For the University of Tokyo, ambidexterity means balancing the utilization of knowledge through the strengthening of our existing operations with the exploration of new knowledge by expanding our horizons. We have adopted this ambidextrous approach so that we can be of even greater service to the world.

As a national institution of higher education founded nearly 150 years ago, the University of Tokyo has long sought to pursue research and education for contemporary applications while striving to explore new horizons. Today, we are especially committed to providing solutions to complex global issues and developing new ideas for human society through dialogue and cooperation. We will continue through both endeavors to increase the social contributions of the University.

However, we have been hindered by a lack both of discretionary funding and of a system for allocating funding within our organization on a flexible schedule. As a national university, the University of Tokyo has been funded largely by the national government's tax revenues. But now that the government's finances have become strained, the University needs to secure additional funding to make up for the shortfall.

Apart from tuition fees and revenue from the University Hospital, the University of Tokyo has conventionally obtained external funding as donations and as funding for collaborative research with private companies. In recent years, we have also diversified our finances by issuing university bonds, becoming the first national university in Japan to do so. As a result, the external funding of the University of Tokyo has increased by an average of 12.6% per year over the past five years (Graph 1). Going forward, we will continue to add value to the intellectual assets of the University of Tokyo in diverse ways, including large-scale collaborative industry-academia innovation (pp. 36–37), support for start-ups in exchange for stock options (p. 16 and later), and the provision of reskilling programs. This further expansion of external funding will enable the University to continue expanding its operations.

Figure 1 shows the funding cycle that enables the University to strategically accumulate funds and invest in a timely manner based on its own management decisions. At present, the University of Tokyo requires approval from the national government to secure funds spanning multiple fiscal years, which inevitably leads to much uncertainty and to financial management biased toward single-year projects. To ensure continuity of operations, the University must record donations

that it has discretion over as liabilities in its accounts. The University uses those donations as funding for 44 billion yen in long-term investments, of which 11 billion yen is entrusted for investment in a portfolio with an expected return of 3.5%, which is anticipated to yield an investment return of 600 million yen annually. Compared to the endowments of leading universities in other countries, however, the scale of those investments is still small and they are insufficient for strong management. The University is therefore urging the national government to amend the law to let UTokyo establish its own endowment. This would enable us to plan the retention of funds other than public funding, treat those funds as equity capital, and utilize the investment returns and principal for up-front investments for the medium to long term. After the law has been amended, the portfolio may be revised toward investments with higher expected returns.

By achieving a strategic, risk-balanced mix of flow-type funding that supports the basic operations of the University, including public funding and student tuition fees, debt-type funding such as university bonds and loans, and equity-type funding, we will achieve truly ambidextrous management with an ideal balance between utilization and exploration.



Graph 1. External funding
Conversion rate 1 USD = 136.40 JPY, TTM rate on March 1, 2023

Relaxed Restrictions on the Issuance of University Bonds

Table 1 compares the financial standing of the University of Tokyo with that of major universities in other countries.

In terms of asset management, American universities clearly enjoy higher returns on investment, while for the University of Tokyo investment assets account for a low percentage of total assets. Instead, UTokyo's assets are dominated by real estate. While those assets include university forests and suburban research facilities (p. 23), the University's main campuses at Hongo, Komaba, and Shirokanedai are located in the Tokyo metropolitan area, making real estate a much larger percentage of its overall assets compared to the other universities.

Since FY2020, the University of Tokyo has issued two rounds of university bonds as social bonds. Table 1 also shows the ratio of interest-bearing debt to EBITDA, which

is the measure preferred by rating companies (that is, cash flow excluding amortization and other items, calculated by adding interest income and depreciation expenses to ordinary profit and loss). Whereas that ratio is 0.5 to 1.1 for other major universities, it is only 0.4 for the University of Tokyo; this low debt ratio indicates that university bonds could be used more widely as a means of funding. New funding through issuing such bonds was made possible by a revision of government regulations, but restrictions remain, including use of the funds being limited to facilities and equipment. Because a university produces value by creating something out of nothing in the form of intangible intellectual assets, UTokyo is currently urging the national government to further relax the restrictions on the issuance of bonds.

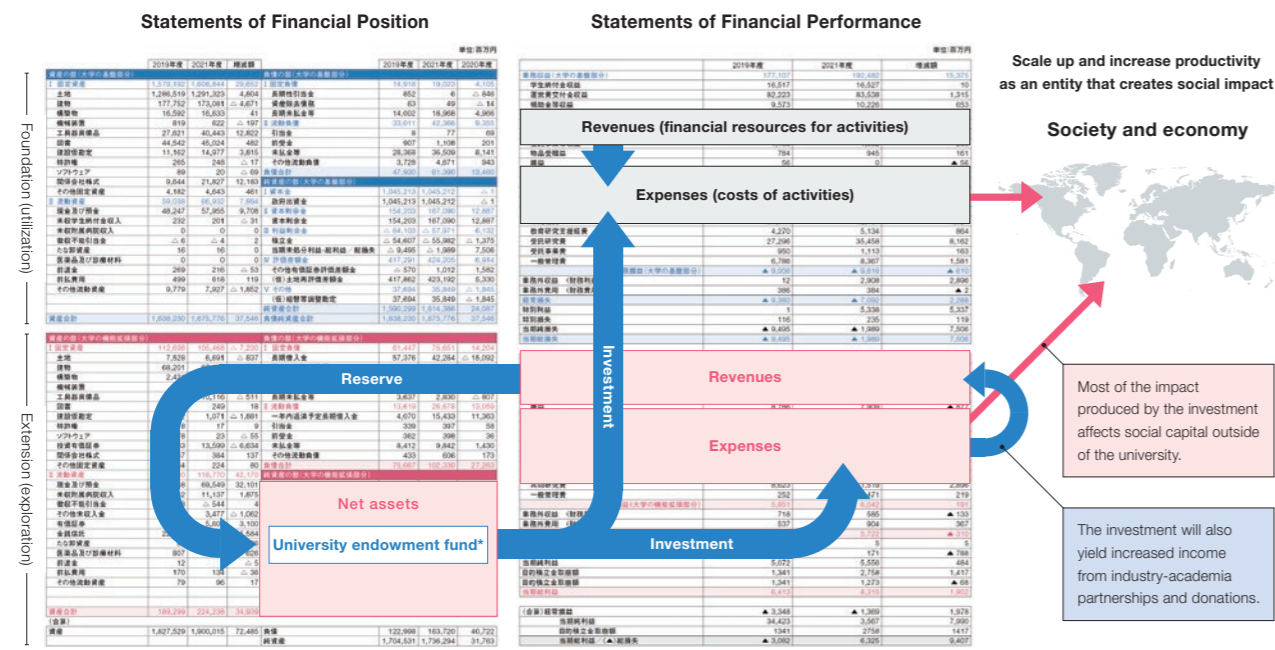


Figure 1. System for Medium- to Long-term Financial Management and Investment
*The University of Tokyo aims to establish a university endowment consisting of a variety of non-public funds in addition to donations, as a new system among national universities in Japan.

	UTokyo	Harvard University	Stanford University	University of California, Berkeley	University of Cambridge	University of Oxford
	2022/3/31	2022/6/30	2022/8/31	2022/6/30	2022/7/31	2022/7/31
Net asset ratio (net assets/total assets)	91.4%	84.2%	79.2%	30.8%	78.9%	72.8%
Investment portfolio value/total assets	2.3%	81.5%	70.9%	52.9%	53.3%	55.4%
Debt/net assets	4.7%	10.0%	13.9%	93.3%	14.7%	24.5%
Property, plant, and equipment/total assets	88.2%	11.6%	17.8%	40.1%	33.4%	21.7%
Total gain on investments/ordinary income	1.2%	39.3%	11.6%	39.5%	0.6%	4.7%
Interest-bearing debt/EBITDA	0.4x	1.1x	0.5x	0.6x	0.8x	0.7x
Percentage of investments in fiscal year-end balance	0.0%	84.3%	6.8%	46.1%	28.5%	0.0%
Size of university endowment (in thousand USD)	80,645	50,877,680	36,338,794	6,948,000	2,550,713	1,948,178

Table 1. Comparison of Financial Standing of the University of Tokyo and Major Universities in Other Countries
Conversion rates 1 USD = 136.40 JPY and 1 GBP = 163.88 JPY, TTM rates on March 1, 2023

The University of Tokyo's Governance Structure

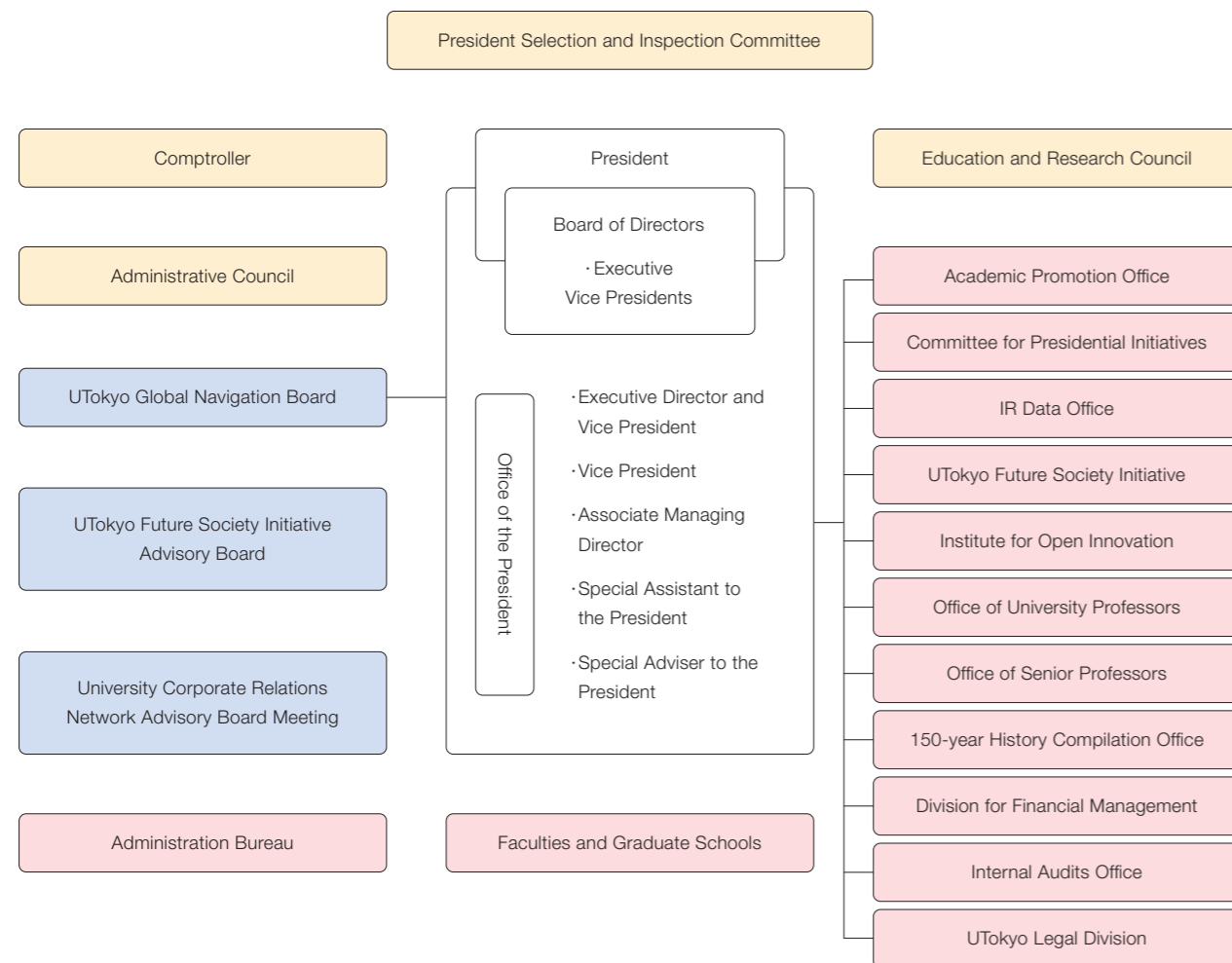
The University of Tokyo should be governed independently and autonomously in accordance with the Constitution of Japan, which guarantees the freedom of education and research. At the same time, as an entity supported by the State with a public role to serve, it should also have a governance structure that is open to society and enables the University to fulfill its social responsibilities. The diagram below outlines the governance structure that enables the University to achieve all of the above.

- The President has ultimate responsibility for education and research.
- The Board of Directors, consisting of the President and nine Executive Vice Presidents, makes decisions on important matters and affairs of the University.
- The Executive Vice Presidents ensure that human resources are deployed in a way that is mindful of diversity and balances knowledge, experience, and ability

so that individual roles and responsibilities are carried out effectively.

- The Administrative Council deliberates on important matters of governance. The majority of its members are appointed from outside the University and reflect a diverse range of perspectives.
- The Education and Research Council deliberates on important matters of education and research. As a forum that contributes to education and research-related decisions by the President through exchanges of opinion between the President and vice presidents on the one hand and department chairs and faculty representatives on the other, the Council embodies the principle of academic freedom.

Additionally, the University of Tokyo has numerous other places for dialogue, such as the UTokyo Global Navigation Board, that give voice to a diverse range of opinions.



The Current State and Future of Diversity & Inclusion (D&I) at the University of Tokyo

Achieving an Inclusive Campus

In June 2022, the University of Tokyo issued "The University of Tokyo Statement on Diversity & Inclusion." To achieve academic excellence, generate innovation in knowledge, and produce globally active professionals, it is critical that the University promote diversity and inclusion. In issuing the statement, the President engaged in dialogue and incorporated the voices of as many members as possible.

The University of Tokyo aims to be a magnetic, inclusive campus where anyone can study, work, and engage in activities with peace of mind.



Figure 1. "The University of Tokyo Statement on Diversity & Inclusion" leaflet

June 23, 2022

The University of Tokyo Statement on Diversity & Inclusion

The University of Tokyo has adopted this Diversity & Inclusion Statement as guidance to all those involved in the university's activities to encourage the creation of a fair and pluralistic society that respects and embraces diversity. Through this statement, the University of Tokyo reaffirms the principle of respect for diversity stated in the university's charter while raising this principle to a new level.

1. Respect for Diversity

Constant dialogue among the diverse members of the University of Tokyo community is essential to the university's commitment to respect fundamental human rights and achieve academic excellence. The University of Tokyo guarantees that no members of our community will be discriminated against based on race, ethnicity, nationality, sex, gender identity, sexual orientation, age, language, religion, beliefs, political or other opinions, background, property, lineage or other social position, marital status, family relationships, lifestyle, disability, health status, career, etc.

2. Promotion of Inclusion

The University of Tokyo respects the spirit of inclusion and, in all of its activities, strives to reflect the diverse perspectives of its community. The university guarantees the opportunity for its diverse constituent members to participate in all of its activities, including decision-making processes, without being unreasonably excluded due to any attribute or background. The university also strives to ensure that not only its constituent members but all those who collaborate with the university are respected and are aware that they belong to a community that shares the principles of this statement.

D&I Promotion Targets

The University of Tokyo aims to meet the following targets by AY2027:

- The percentage of newly hired female researchers will be 30% or more (25.6% in AY2021).
- The percentage of female faculty members will be 25% or more (16.7% as of May 1, 2022).
- The percentage of female faculty and staff in managerial positions will be 25% or more (19.3% as of April 1, 2022).
- The number of foreign researchers will be increased by 20% over AY2019 (increased by 15.4% as of May 1, 2022).

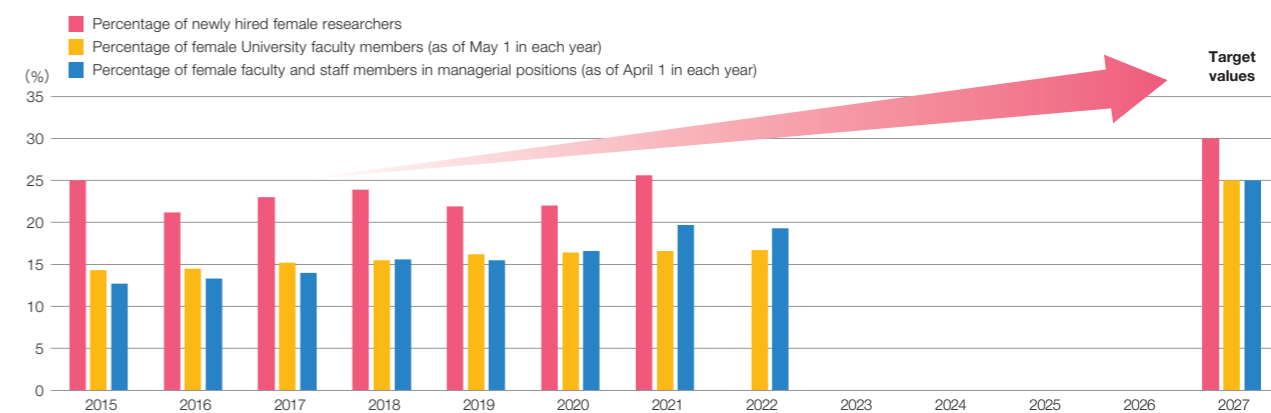


Figure 2. Numerical Targets and Trends

The Current State and Future of Green Transformation (GX) at the University of Tokyo

Progress Toward Goals as an Academic Institution

In the late 1980s, the greenhouse effect became widely recognized as increasing the risk of global warming. With that in mind, in 1994 the University of Tokyo launched the Alliance for Global Sustainability (AGS) in partnership with the Massachusetts Institute of Technology (MIT, USA) and Eidgenössische Technische Hochschule Zürich (ETH Zürich, Switzerland) as an international inter-university academic collaboration focused on maintaining a sustainable anthroposphere. This was the world's first sustainability-related initiative by universities.

In 1998, the Graduate School of Frontier Sciences was established with one focus being on environmental studies.

In 2005, the Integrated Research System for Sustainability Science (IR3S) (reorganized in 2019 as the Institute for Future Initiatives) was launched. In 2008, the Sustainable Campus Project (TSCP), which continues to this day, was begun with the aim of creating a sustainable campus.

And in 2021, after Teruo Fujii became UTokyo's president, Green Transformation, or GX, was made a major pillar of UTokyo Compass.

As all this shows, the University of Tokyo, as a global research university, has long been addressing climate change issues through its research, education, and administration.

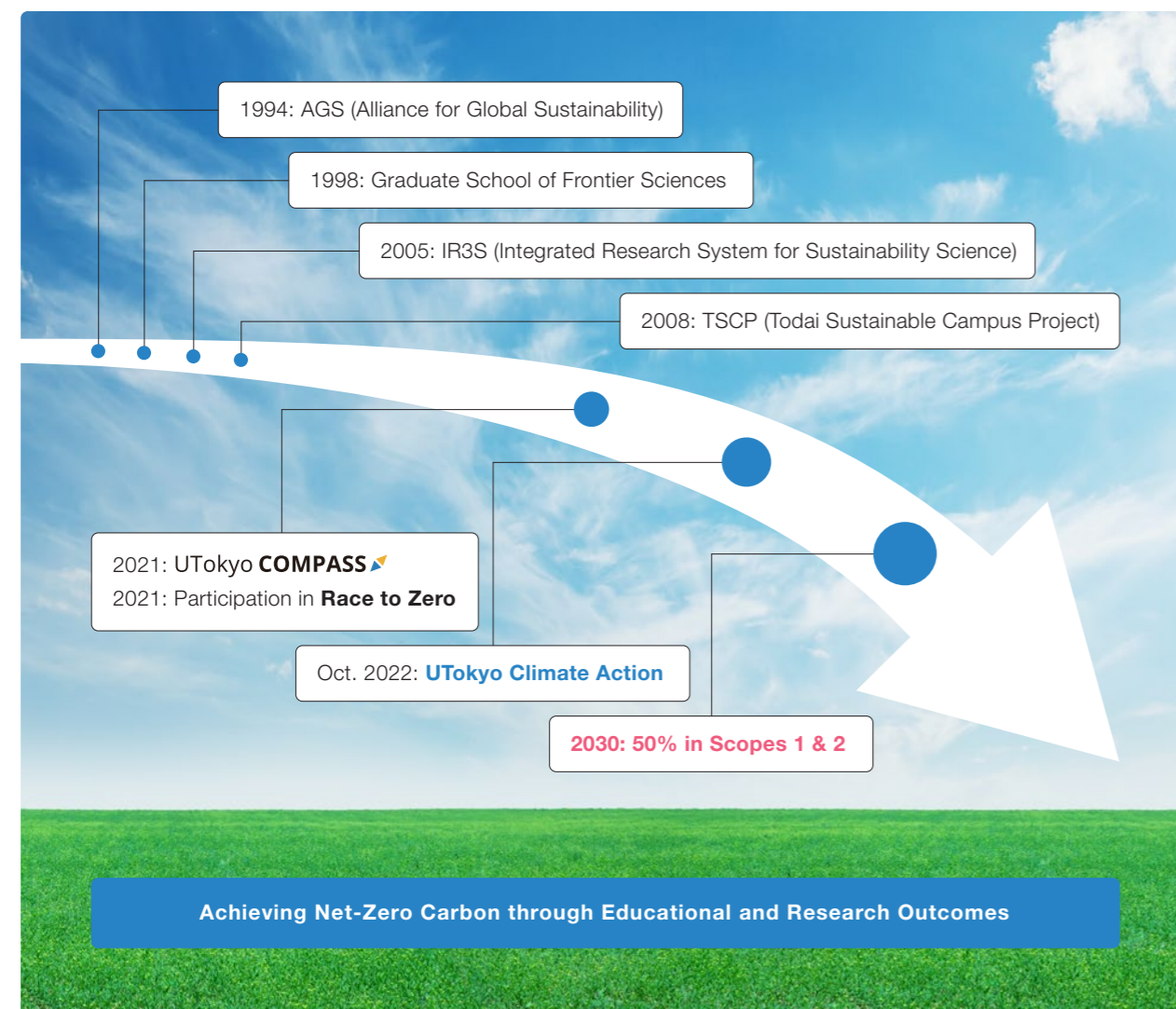


Figure 1. Sustainability Initiatives

Progress Toward Goals as a Business Entity

The University of Tokyo is one of Japan's leading universities, but it also emits significant amounts of carbon dioxide.

In October 2021, we became the first Japanese national university to join the international Race to Zero campaign launched by the United Nations Framework Convention on Climate Change (UNFCCC), and in October of this year, we developed an action plan, UTokyo Climate Action, to achieve net-zero greenhouse gas emissions by 2050. The plan calculates GHG emissions for Scopes 1, 2, and 3 and sets reduction targets for each Scope to be achieved by 2030, 2040, and 2050 (Table 1).

Phase	Baseline	Reduction target (Scopes 1 & 2)	Reduction target (Scope 3)	Target year
Phase 1	2013	50%	25%	By 2030
Phase 2	2013	75%	50%	By 2040
Phase 3	2013	100%	75%	By 2050

Table 1. UTokyo Reduction Targets by Scope and Phase

Scope 1 includes direct emissions such as those from on-campus fuel use. Scope 2 includes indirect emissions associated with the purchase of energy. Scope 3 includes various other emissions, such as those from the production of goods, services, capital goods, etc., that the university purchases, emissions related to transportation outsourced to other operators, and emissions related to commuting and business travel by faculty and staff. When Scope 3 emissions were calculated separately for each of the 15 categories, Scope 3-1 and Scope 3-2 were found to be especially large (Figure 2). As there are still very few universities in the world that have gone so far as to include Scope 3 in their calculations, this is a cutting-edge effort.

UTokyo Climate Action aims to halve emissions by 2030 and achieve net-zero emissions by 2050.

On the other hand, our latest calculations revealed surprising environmental impacts resulting from processes induced by the purchase of goods, such as mining of raw materials, manufacturing of products, and transportation that are indirect greenhouse gas emissions through everyday activities at the University. Achieving the goals will not be easy. To be sure, eliminating greenhouse gas emissions by the University alone will not make a significant

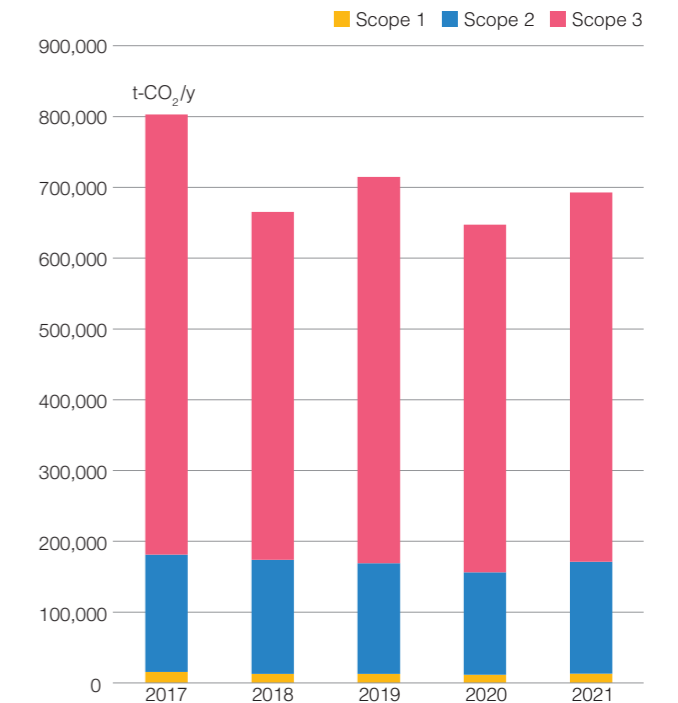


Figure 2. UTokyo Scope 1,2,3 GHG calculation results

*For Scope 3 calculations, the amount of activity is estimated from financial data for each year. GHG emissions were calculated using the LCA database IDEAv2.3. The calculation results include a degree of uncertainty.

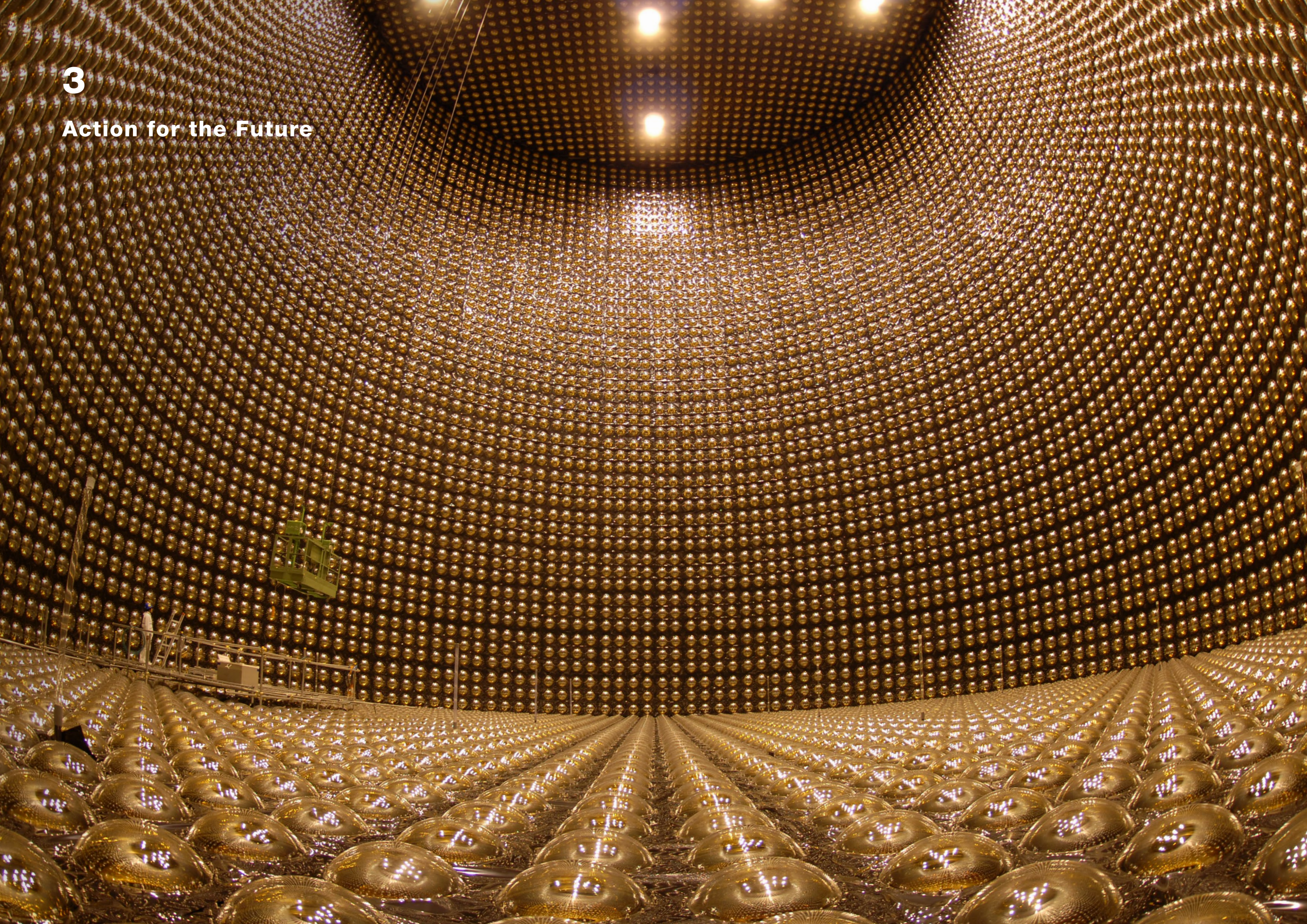
*CO₂ sequestration at seven university-forest sites across Japan, including in Hokkaido and Chichibu, is equivalent to 119,794 t-CO₂/y (2020) (not counted in Race-to-Zero).

contribution on a global scale. However, if the University achieves its goals and thereby promotes behavioral change, then society may change and the emissions of ordinary households and society as a whole may change significantly as well. The University of Tokyo promotes the transformation towards a greener economy and the revitalization of society through research results and the production of human resources. This is the GX that we are aiming for. We hereby pledge that all faculty, staff, and students will work together to promote GX.



3

Action for the Future



Information Design and Archiving Methodologies

In the Liquid Galaxy (Figure 1), a large multi-display system comprising seven 55-inch displays connected vertically, there is another Earth, the “Digital Earth,” where memories of war and records of disaster have the power to jolt viewers with the realization that “behind the data, there are people” and bridge the temporal and spatial gap between them and us.

“On a small computer screen, it tends to feel like a game and lacks a sense of reality. When you see it at this size, you feel like events are happening right before your eyes,” says Professor Hidenori WATANABE of the Interfaculty Initiative in Information Studies and the Graduate School of Interdisciplinary Information Studies, as he explains the significance of representing digital archives visually on a large screen, which he likens to a “work of art.”

The objects preserved in digital archives can vary widely, ranging from museum and library collections, to tangible and intangible culture properties, to industrial resources. The purpose of a digital archive is to preserve and store that information so that database technology and other such tools can be used with it. Professor Watanabe has introduced the concept of multi-dimensional digital archives. This approach deepens our understanding by working in collaboration with a diverse range of people across borders and generations to take previously scattered digital archives and combine them on Digital Earth.

A product of this approach is the Digital Archive Series (Figure 2), which collects and preserves on Digital Earth the testimonies of Hiroshima and Nagasaki atomic bomb



Figure 1. Professor Watanabe explains the digital archive displayed on Liquid Galaxy. He hopes that people will view the archive not alone, but with others, and share their impressions with each other.

survivors and records of the Great East Japan Earthquake. Professor Watanabe has been engaged in other activities involving digital technology in an effort to accurately record the extent of damage and to support reconstruction efforts, including the Rebooting Memories project, in which black-and-white photos are colorized through a collaboration between people and AI to vividly revive memories of the past, and a 3D model mapping project that shares the current state of wars and disasters occurring now through a collaboration involving people around the world connected via the Internet. Constructed in virtual space in collaboration with a diverse range of people across borders and generations, this ever-evolving “archive of memory” will serve to connect people in spirit and lead to a better future.



Figure 2. Hiroshima Archive
Hiroshima in 1945, as re-created on Digital Earth. The atomic blast is represented by the red ball, while the faces of bomb survivors interviewed by local Hiroshima City high school students are mapped onto the locations where they were exposed to the bomb at the time.



Body Schema Support through “Enhancing Human I/O”



Remote operation enables two people in separate locations to share the same perspective and work in tandem. It is also a communication medium that increases empathy between the participants. (Photograph courtesy of the University of Tokyo, Inami/Monnai Laboratory & Keio Media Design)

Professor Masahiko INAMI of the Research Center for Advanced Science and Technology has proposed the concept of JIZAI (i.e., people’s ability to intuitively take the actions they wish), which stands both in contrast to and parallel with the concept of automation, in which machines perform tasks that humans do not wish to, and he continues to conduct research aimed at enhancing human capabilities through the use of various technologies.

Professor Inami refers to the technology and research field of enhancing human capabilities to achieve this state of JIZAI as “enhancing human I/O,” and he is working to develop a variety of devices for these purposes. As an example, Fusion, which makes use of robotic arms operated remotely via VR, enables people in separate locations to share the same perspective to work in tandem or even to teach a musical instrument or a sport by holding the wrists of the learner to guide their movements from afar. Everyone who experiences these human augmentation technologies

seems to be delighted by the new things they can do, even if they are accomplishing them through a “new body.”

By enhancing the capabilities of our body with these devices such that they feel like an extension of our own body rather than mere tools, we are able to learn more about our body’s functions and explore its limitations. Professor Inami aims to establish the science of body informatics by modeling the relationship between this new form of physicality and the brain that controls it using an informatics-based approach.

When asked about the significance of his research, Professor Inami explains, “Through the power of technology, we can accomplish today that which was impossible yesterday, and may become able tomorrow to accomplish that which is impossible today. If we believe in this, then we can remain positive about the future.” He continues to conduct research aimed at achieving physical JIZAI, which will surely lead to the future pursuit of mental JIZAI.



Research to Produce Sustainable Yet Delicious “Cultured Steak”

In March 2022, Professor Shoji TAKEUCHI of the Graduate School of Information Science and Technology and a research group from Nissin Foods Holdings Co., Ltd., succeeded in producing edible cultured meat, a first for collaborative industry-academia research on cultured meat in Japan. While global meat consumption is expected to increase due to population growth and people's changing lifestyles, there are also growing concerns about meat shortages and the environmental impact of livestock production. This has been fueling interest in cultured meat as a new meat option. Made by cultivating livestock cells in vitro, cultured meat can be produced with less space and fewer resources than raising livestock, and could thus help resolve various global issues, including environmental protection and a stable food supply.

While cultured ground meat is already available, the production of thick, steak-like meat requires more advanced

technology and has yet to be achieved by anyone. Taking on this unprecedented challenge is Professor Takeuchi. Through collaborative research with Nissin Foods Holdings, Professor Takeuchi succeeded in 2019, for the first time anywhere in the world, in producing cultured meat in cubed steak form (1×0.8×0.7 cm, weighing about 1 gram) using beef-derived muscle cells. Unfortunately, because it was made using research-grade material (pharmaceuticals), the taste and texture could only be analyzed using instruments. Now, with the successful creation of cultured meat that can be eaten, it will be possible to actually eat the cultured meat and evaluate its taste and texture, and this is expected to promote further research.

The research group aims to fully develop technology to create 100 g cultured steak meat by the year 2025. In the not-too-distant future, cultured steaks as thick and delicious as real beef may be on our dinner tables.

Environmental protection	Once cultured meat is available, it is estimated that it will require 50% less energy, 90% less greenhouse gases and water, and 1/100th the amount of land compared to beef.
Solving the food crisis	Production will be possible independent of climate change. Also, because it can be produced and consumed locally without relying on imports, it is advantageous in terms of food security.
Safety	Because it can be produced under sterile conditions, there is less risk of contamination by E. coli and other bacteria, which may make it possible for it to be consumed raw or even stored at room temperature. Likewise, there is no need to worry about zoonotic diseases like avian influenza or the problem of resistant bacteria, which result from antibiotics administered to livestock to prevent such diseases.
Solving food waste	Worldwide, the beef equivalent of nearly 75 million head of cattle gets thrown away each year without being eaten. It takes two to three years to raise a cow, whereas cultured meat can be produced in just one to two months, making it easier to control production in response to changing social conditions or other factors.
Animal welfare	Livestock production currently contends with issues that include the loss of animal life and methods of raising livestock that do not consider animal comfort. Cultured meat can be produced from a small quantity of cells, thus reducing the number of animals that are sacrificed for meat.

Societal Impact

How to Govern AI by Multi-Stakeholders?

While artificial intelligence (AI) has made our lives more convenient, it has also reproduced the discrimination and prejudice found in society, for example, when a black man was mistakenly identified by a facial recognition system and falsely arrested, or when a job-recruitment AI caused a stir by rating women lower and its development was suspended. Arisa EMA, an associate professor at the Institute for Future Initiatives who was included among the 100 Brilliant Women in AI Ethics* in 2019 and 2020, believes that such problems can be solved by including people with diverse perspectives at the early stages of AI development in discussions to overcome unconscious bias.

As a tool to promote stakeholder dialogue, Associate Professor Ema's research group, the Technology Governance Research Unit, AI Governance Project, has developed a “risk chain (RC) model.” For each of the possible risk scenarios, the model proposes a risk chain (relation of risk factors) and steps to be taken by each party (AI system developers, service providers, and users) to control risks. RCMModel is currently featured in 11 case studies, including recruitment AI, unstaffed convenience stores, and cancer diagnostic AI.

To ensure the reliability and transparency of AI-based services, it is important that not only system developers but also service providers and users consider the values they want to promote in society, the potential risks, and how to minimize those risks. The RCMModel is freely available for anyone to use under a Creative Commons License on the Institute for Future Initiatives website.

RCModel



*Women in AI Ethics (WAIE), a global initiative with a mission to increase recognition, representation, and empowerment of women in AI ethics, annually selects 100 women who are active in the world of AI ethics.

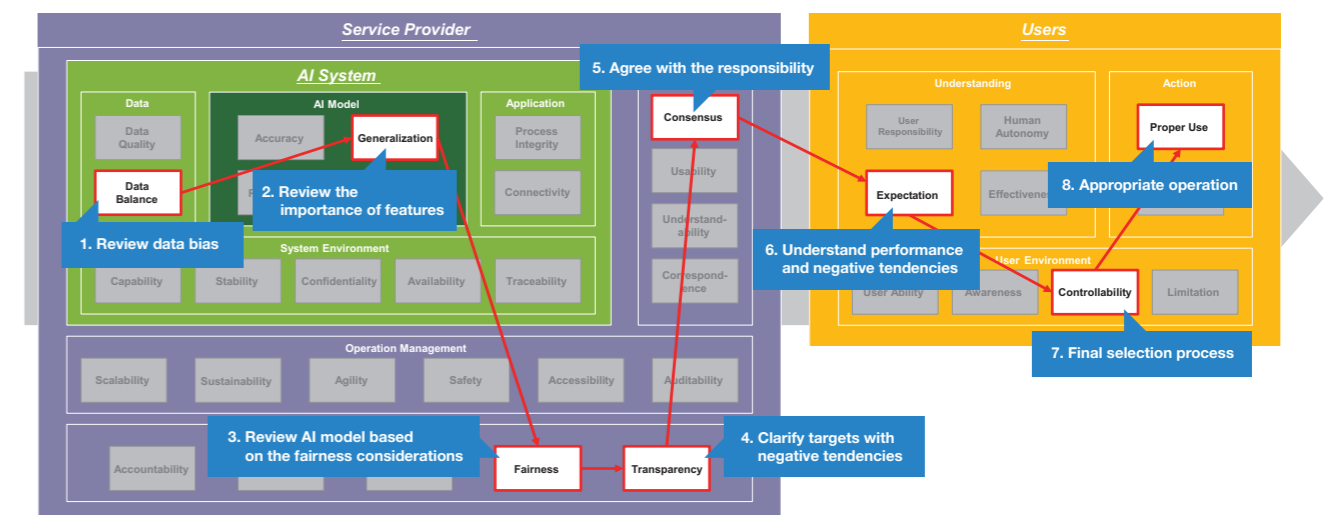


Figure 1. Example of RCMModel

This model evaluates the risk of bias based on country, region, race, gender, age, etc. by a job-recruitment AI system.

Quantum Technology Strategy of The University of Tokyo

The Challenge of Applying Quantum Computing in Society: The University of Tokyo-IBM Gateway Initiative

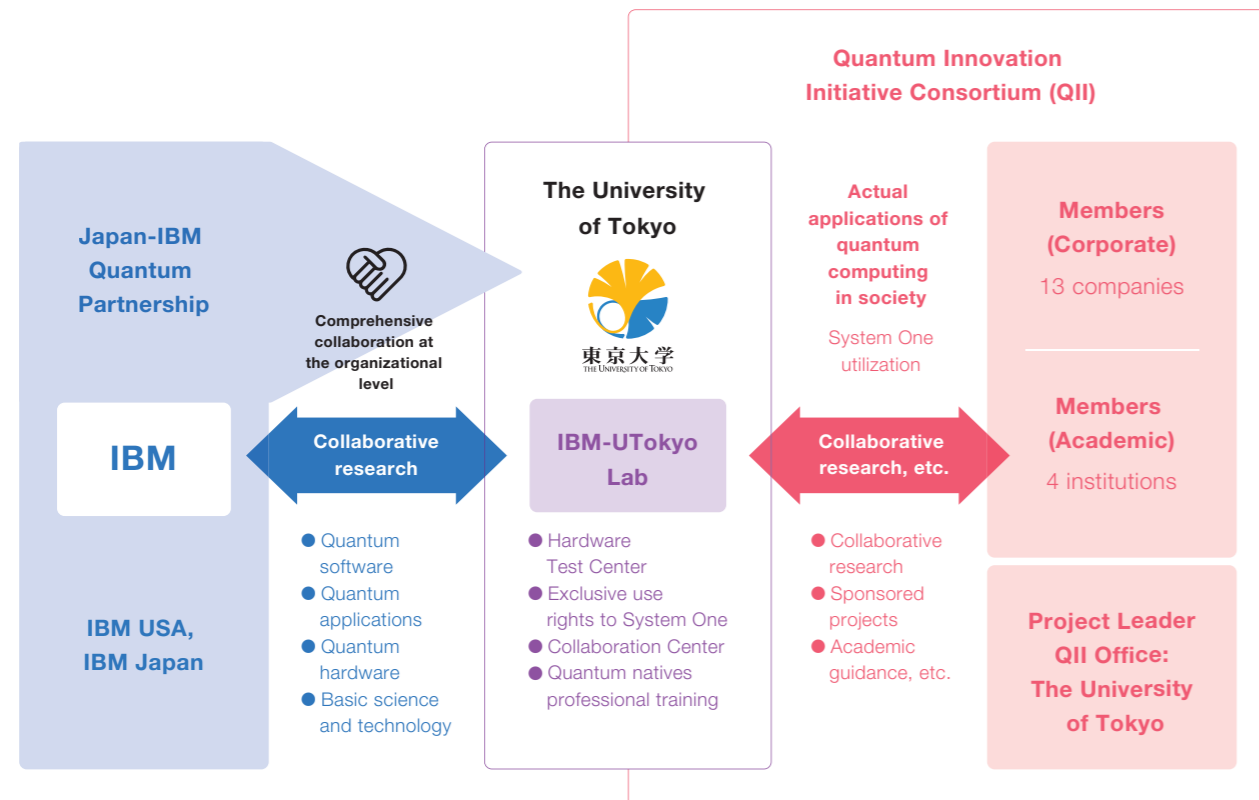
In 2021, the University of Tokyo and IBM opened the University of Tokyo-IBM Quantum Hardware Test Center on the Asano Campus of the University of Tokyo to research and develop quantum computing technology. The Test Center is equipped with a quantum computer system testbed for evaluating components to be used in future large-scale quantum computers.

The same year, Japan's first gate-based commercial quantum computing system, IBM Quantum System One, for which the University of Tokyo has exclusive use rights, began operation at a dedicated facility in Kanagawa Prefecture. Together with companies participating in the Quantum Innovation Initiative Consortium established in 2020, the University has been using System One to promote practical applications of quantum computing in society.

At the same time, the UTokyo-IBM Quantum Collaboration Center was created on the Hongo campus. Engineers from IBM are directly involved with the Collaboration Center and actively exchange information with researchers from the University and QII Members about the software, algorithms, and other technology needed to utilize System One.

These three hardware and software initiatives are based on the Japan-IBM Quantum Partnership that was signed between IBM and the University of Tokyo in December 2019. Under this partnership, which allows the broad participation of other universities, public research institutions, and industry, the University of Tokyo serves as a gateway that contributes to solving issues in Japanese society through the research, development, and utilization of quantum computers.

UTokyo-IBM Gateway Initiative: Conceptual Diagram



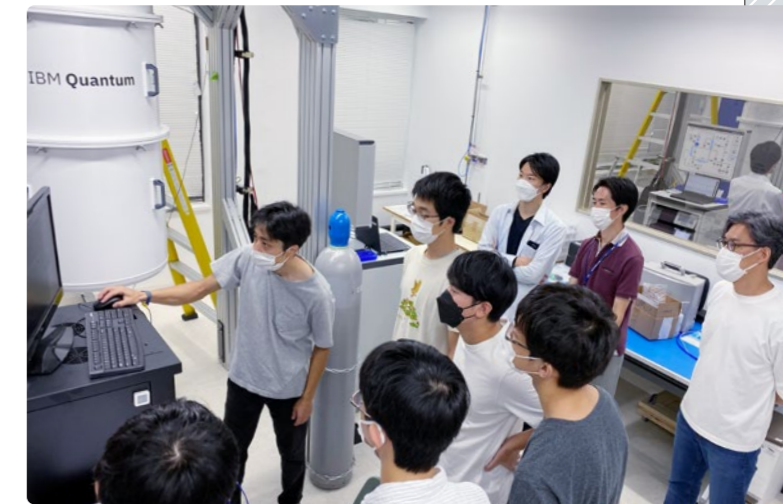
IBM Quantum System One at KBIC in Kawasaki City

Pioneering the Future with Two Quantum Computers and Collaborative Industry-Academia Innovation at the IBM-UTokyo Lab

The Japan-IBM Quantum Partnership, an initiative involving Japanese industry, academic institutions, and research institutes, aims to make Japan a leader in the actual use cases of quantum computing through strategic research and development at the IBM-UTokyo Lab (established June 2020).

“What will the future look like once quantum computing has practical applications? We imagine how society will look, share that vision with stakeholders, and work backwards to decide what needs to be done right now. What makes this possible is collaborative, ‘organization-to-organization’ industry-academic innovation,” explains IBM-UTokyo Lab’s enthusiastic director, Professor Masaki KAWASAKI.

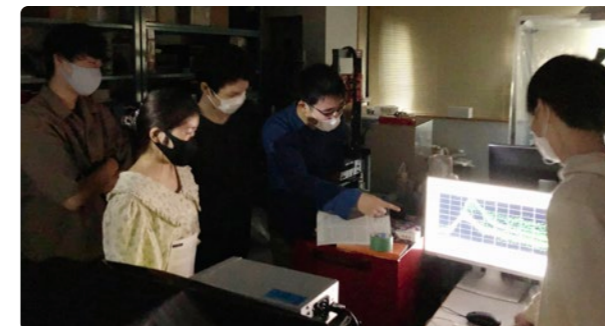
Exclusive use rights to System One mean far more “machine time” (the amount of time that the quantum computers can be used for computing), and the accelerated response means that research findings are published much faster. Additionally, the five-qubit machine installed at the test center, IBM Quantum, is exceptionally stable and makes it possible to test peripheral systems and component materials that help to enhance capabilities of quantum computers, raising hopes for breakthroughs in



Practicum lecture on quantum computers using IBM Quantum

materials technology development.

As part of the University, it is also a place to train the quantum professionals of tomorrow, today. In collaboration with Professor Hiroshi IMAI of the Graduate School of Information Science and Technology, the IBM-UTokyo Lab trains quantum “natives” for quantum computer-related technologies in three stages, including the Komaba Campus (liberal arts education), Department of Physics, Faculty of Science (upper-division undergraduate program), and Information Science and Technology (Master’s program). In AY2022, the second year of the program, there were 161 new students who embraced the challenge of practical quantum computing using IBM Quantum. There are now more than 320 quantum natives who transcend the divide between the humanities and the sciences, and their numbers will only continue to grow.



Miraculous Encounters of the Sleeping Beauty and Her Prince

The curse placed upon the beautiful Aurora was terrifying. Cast into a deep sleep upon her 16th birthday, she is awoken from her slumber by a kiss from the prince. This ancient European fairy tale, “Sleeping Beauty,” closely reflects certain characteristics of research. Specifically, it captures the varied timeframes by which the knowledge produced by research is eventually put to use in society.

Professor Ichiro SAKATA of the School of Engineering, who is also a data science expert, and his team performed a network analysis on 70 million scholarly articles and 1.2 billion citations (connections) in Scopus to understand the relationship between a “Sleeping Beauty” and her “Prince.” According to Professor Sakata and his colleagues, there is not necessarily a correlation between a paper’s orthometrics (a measure that assesses a scholarly article’s social impact), i.e., how frequently a paper is mentioned on social media, and its citations (a measure of the number of times a scholarly article is cited). But they also report many cases in which emergent research that failed to garner the academic community’s attention for many years (a Sleeping Beauty) suddenly has its break-out moment when it appears in a Prince of an article.

Long ago, there was Mendelian genetics. Or the case of biologist Osamu Shimomura, whose discovery of green fluorescent protein went

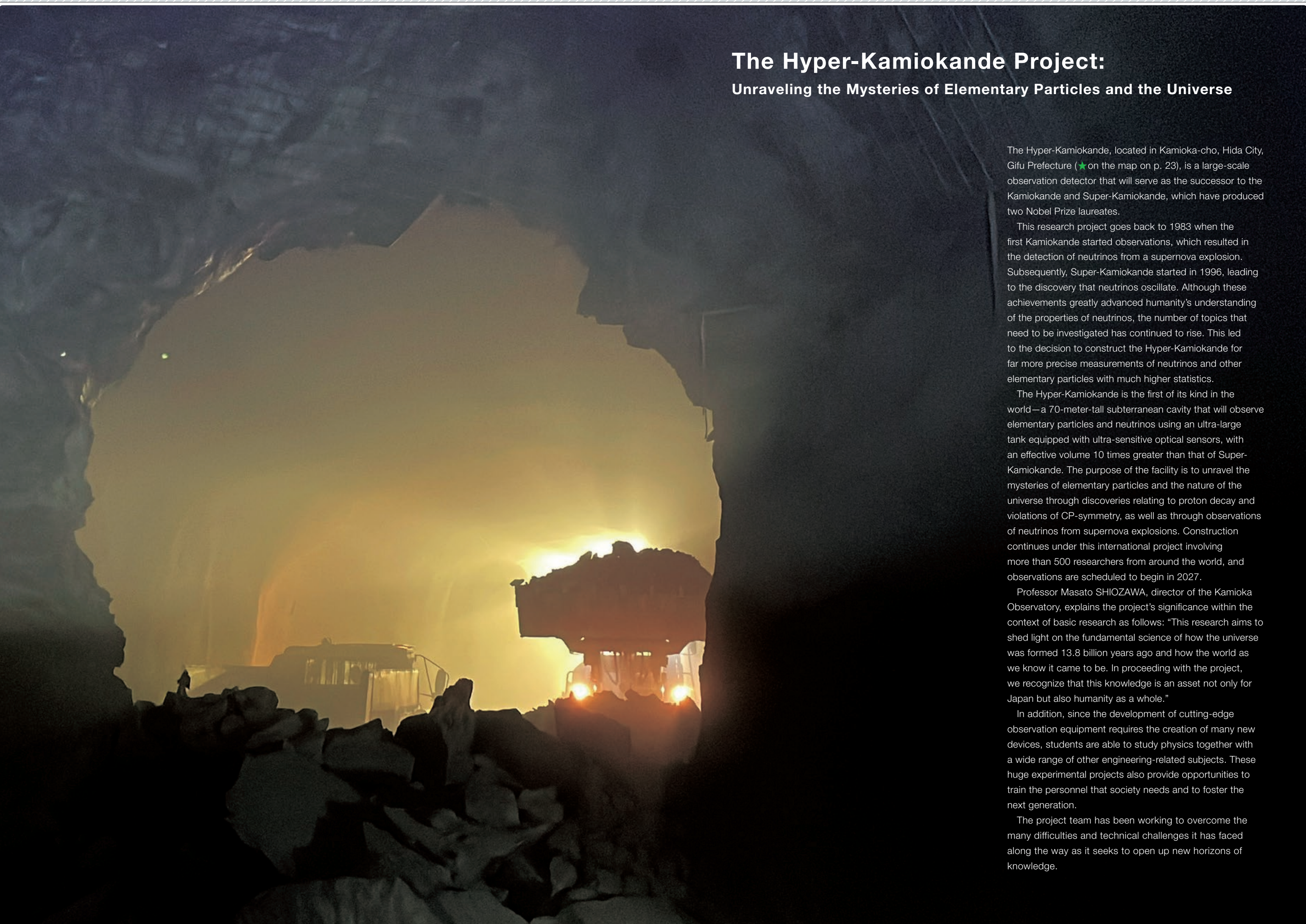
unnoticed for many years before two researchers in the U.S. played the role of the Prince by calling attention to his work, resulting in all three sharing the Nobel Prize in Chemistry in 2008.

Although Princess Aurora slept for 100 years, this research suggests that such scholarship lies dormant in the dark for an average of 30 years before having a sizable impact on society. And, from among the 70 million scholarly articles examined, the number of such miraculous matches between a Sleeping Beauty and her Prince was reported to be more than 30,000.

Temporal variation has always characterized science, but the timeframe of the value it creates is itself varied and fuzzy, too. At the University of Tokyo, an abundance of research lies asleep and waiting for a miraculous encounter with its Prince. We hope this story conveys that the number of citations of an article is not the only way to measure the value of research, and that there remain many studies yet to grow and flower from this diverse seedbed.

Original paper
T. Miura, K. Asatani, I. Sakata, “Large-scale analysis of delayed recognition using sleeping beauty and the prince,” *Applied Network Science* 6(1) (2021):48.





The Hyper-Kamiokande Project: Unraveling the Mysteries of Elementary Particles and the Universe

The Hyper-Kamiokande, located in Kamioka-cho, Hida City, Gifu Prefecture (★ on the map on p. 23), is a large-scale observation detector that will serve as the successor to the Kamiokande and Super-Kamiokande, which have produced two Nobel Prize laureates.

This research project goes back to 1983 when the first Kamiokande started observations, which resulted in the detection of neutrinos from a supernova explosion. Subsequently, Super-Kamiokande started in 1996, leading to the discovery that neutrinos oscillate. Although these achievements greatly advanced humanity's understanding of the properties of neutrinos, the number of topics that need to be investigated has continued to rise. This led to the decision to construct the Hyper-Kamiokande for far more precise measurements of neutrinos and other elementary particles with much higher statistics.

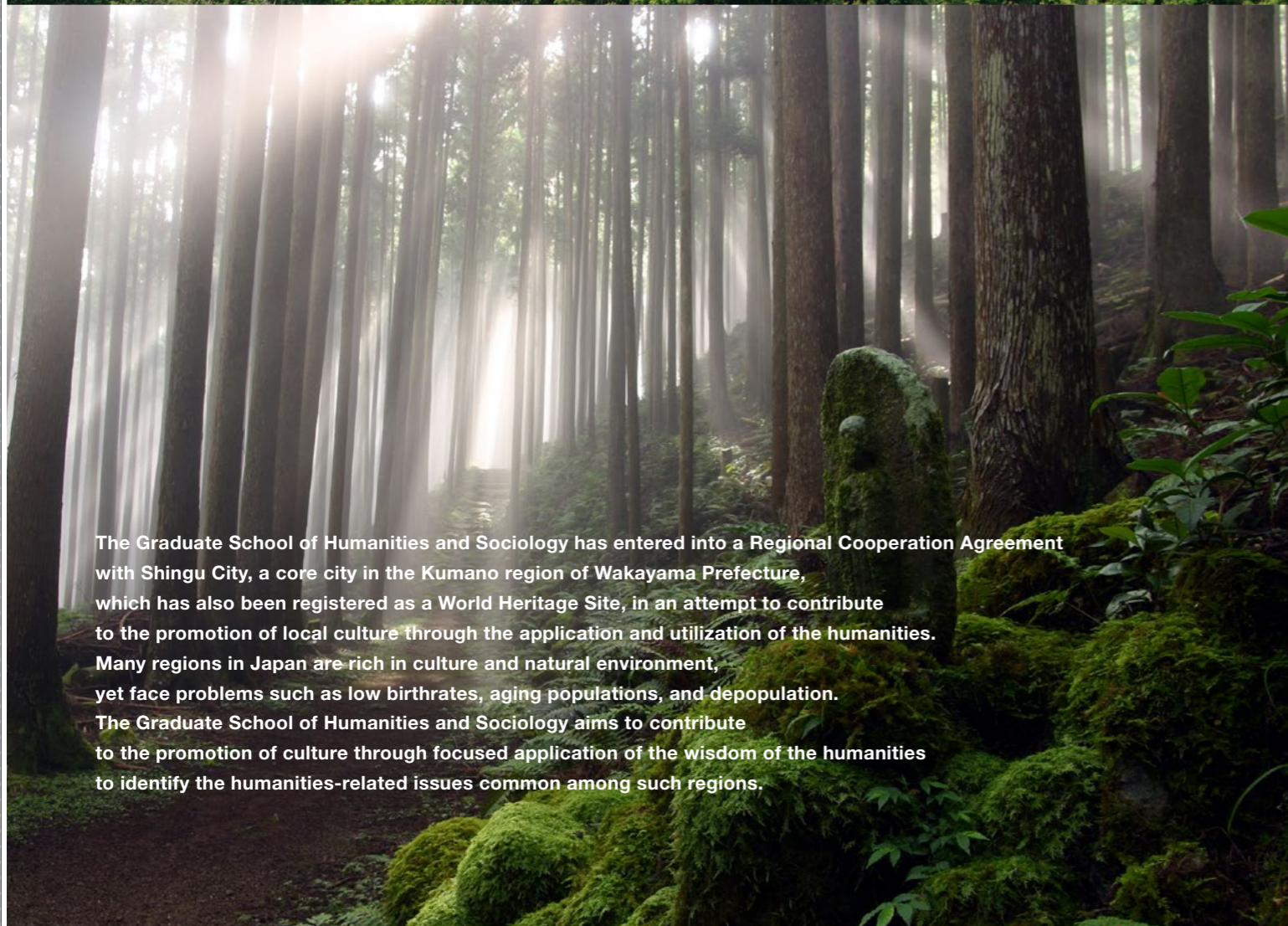
The Hyper-Kamiokande is the first of its kind in the world—a 70-meter-tall subterranean cavity that will observe elementary particles and neutrinos using an ultra-large tank equipped with ultra-sensitive optical sensors, with an effective volume 10 times greater than that of Super-Kamiokande. The purpose of the facility is to unravel the mysteries of elementary particles and the nature of the universe through discoveries relating to proton decay and violations of CP-symmetry, as well as through observations of neutrinos from supernova explosions. Construction continues under this international project involving more than 500 researchers from around the world, and observations are scheduled to begin in 2027.

Professor Masato SHIOZAWA, director of the Kamioka Observatory, explains the project's significance within the context of basic research as follows: "This research aims to shed light on the fundamental science of how the universe was formed 13.8 billion years ago and how the world as we know it came to be. In proceeding with the project, we recognize that this knowledge is an asset not only for Japan but also humanity as a whole."

In addition, since the development of cutting-edge observation equipment requires the creation of many new devices, students are able to study physics together with a wide range of other engineering-related subjects. These huge experimental projects also provide opportunities to train the personnel that society needs and to foster the next generation.

The project team has been working to overcome the many difficulties and technical challenges it has faced along the way as it seeks to open up new horizons of knowledge.

Initiatives for Regional Collaboration by the Graduate School of Humanities and Sociology



The Graduate School of Humanities and Sociology has entered into a Regional Cooperation Agreement with Shingu City, a core city in the Kumano region of Wakayama Prefecture, which has also been registered as a World Heritage Site, in an attempt to contribute to the promotion of local culture through the application and utilization of the humanities. Many regions in Japan are rich in culture and natural environment, yet face problems such as low birthrates, aging populations, and depopulation. The Graduate School of Humanities and Sociology aims to contribute to the promotion of culture through focused application of the wisdom of the humanities to identify the humanities-related issues common among such regions.



The Mifune Matsuri, an annual festival at Kumano Hayatama Taisha Shrine, has also been designated by the government as an Important Intangible Folk Cultural Property. This ancient ceremony re-enacts the arrival of the Kumano deities from Kamikura to the land of Hayatama, and is renowned as the best boat festival in the Kitan region.

Hands-on activity in Sacred Kumano, a World Heritage Site

With the cooperation of Shingu City, Wakayama Prefecture (★ on map on p. 23), the University of Tokyo has been operating a hands-on activity since 2017 to provide undergraduate and graduate students with the opportunity to learn more about the culture and administration of Shingu City, while experiencing the history, culture, and natural environment of Kumano, which is regarded as a sacred site. Professor Akira AKIYAMA (an art historian) of the Graduate School of Humanities and Sociology, who has been involved in this program since the planning stage, explained that the sacred sites of Kumano, registered as a World Heritage Site, provide an endless treasure trove of research topics for those studying the humanities. He further explained that, for the University of Tokyo, which aspires to be “a university that anyone in the world would want to join,” there is much to learn from Kumano, a region that has welcomed and accepted people of all walks of life regardless of religion, gender, or status for more than 1,200 years. He added that students who have participated in the program have—through their experiences in Kumano—come to view their own values in a more relative sense, leading to deeper observations and reflections.

In this program, students actually walk the Kumano pilgrimage route guided by a local religious folklore researcher, listen to lectures given by the head priests of local shrines and temples, and participate in discussions with the mayor and other local residents involved in the administration of this regional core city. Each year, the participants include students from the Faculty of Letters

and the Graduate School of Humanities and Sociology, as well as other undergraduate and graduate students studying a variety of different specialized fields in both the humanities and the sciences. The program provides students with opportunities to develop both physical and mental strength, which are difficult to attain in a more urban setting.



Students visiting Kamikura Shrine in Shingu City, which was built to worship a giant sacred stone, as part of the hands-on activity.

Partnership Agreement between Shingu City and the Graduate School of Humanities and Sociology and the Faculty of Letters

Collaboration between Shingu City and the Graduate School of Humanities and Sociology and the Faculty of Letters, set in motion by this hands-on activity, has since developed into holding the Kumano Forum to highlight the characteristics of Kumano as a sacred site through mutual comparison with sacred sites in other regions and countries, as well as hands-on opportunities for international students and other participants. In March 2021, Shingu City and the Graduate School of Humanities and Sociology and the Faculty of Letters officially entered into a partnership agreement. The purpose of the agreement is to collaborate in efforts to develop research on the Kumano region, to utilize such research to promote regional development as well as international communication and exchange, to provide domestic and international students with opportunities for hands-on experience and training, to revitalize the Kumano region through social education on the region, and to research and preserve cultural assets.

In appreciation of the benefits of collaboration, Michitoshi TAOKA, mayor of Shingu City, commented that the University of Tokyo's activities in Shingu City will likely generate ripple effects that go beyond the scope of academia, culture, and education. Shigeyasu HAYAMI, superintendent of the Shingu City Board of Education, who has been energetically involved in education as well as the preservation and utilization of the World Heritage Site, also expressed high hopes for the collaboration. He keenly feels that the universal value of the sacred sites of Kumano, a World Heritage Site of which local residents are largely unaware, is being redefined through the genuine academic achievements of the University of Tokyo, and he expressed his desire for this to continue into the future.

Under this agreement, in November 2021, the Kumano Project Shingu Branch Office was established in a section of a composite cultural facility within the city,

where a researcher affiliated with the Graduate School of Humanities and Sociology is stationed on a seasonal basis. Assistant Professor Izumi Florence OTA (specialized in art history), who spent about four months since then conducting research in Shingu City, commented on the wonderful experience she gained as a researcher by sharing information in an easy-to-understand way on her research in the humanities while living in the region and communicating with the local people. She also actively promoted regional collaborative activities, such as starting a new outreach activity in which faculty members from the University of Tokyo introduce their research in the form of lectures, broadening their target audience to include local junior high and high school students in order to introduce them to the fascinating world of the humanities.

In addition, in November 2022, the University of Tokyo entered into a Comprehensive Partnership Agreement with Wakayama Prefecture, where Kumano and Mt. Koya are located. Following Mie Prefecture and Fukushima Prefecture, this marks the third such partnership with a prefectural-level municipality. Under this partnership, the Graduate School of Humanities and Sociology, the Research Center for Advanced Science and Technology, the Institute of Industrial Science, and other participants will promote academic research to solve regional issues as well as personnel exchanges through field studies and other collaborative initiatives in which University of Tokyo students reside in the prefecture for a certain period of time.

The reverse side of the Agreement signed with Shingu City is decorated with a protective talisman unique to the three main shrines of the Kumano region.



The Oto Matsuri, held annually at Kamikura Shrine, has also been designated by the government as an Important Intangible Folk Cultural Property. This festival signifies the renewal of fire at the beginning of the year, and the ritual represents purified fire being bestowed upon the people.



Kumano Nachi Taisha

Sacred Sites and Pilgrimage Routes in the Kii Mountain Range, a World Heritage Site

Kumano (the area surrounding ★ on the map on p. 23), located in the southern part of the Kii Peninsula, the largest peninsula in Japan, which juts out southward from the center of Honshu into the Pacific Ocean, is a region blessed with a rich and varied natural environment comprised of mountains, rivers, waterfalls, and the sea. In the past, Kumano was considered the gateway to the Buddhist Pure Land, attracting so many people on pilgrimages to the area in search of salvation that they were metaphorically likened to rows of marching ants. The Kumano Kodo Road connects the three main shrines of the Kumano region in Wakayama Prefecture: Kumano Hongu Taisha Shrine (Tanabe City), Kumano Hayatama Taisha Shrine (Shingu City), and Kumano-Nachi Taisha Shrine (Nachikatsuura Town, Higashimuro District). This road was registered as a UNESCO World Heritage Site in July 2004 under the title "Sacred

Sites and Pilgrimage Routes in the Kii Mountain Range," along with the Omine Okugakemichi Road, which connects Kongobuji Temple on Mt. Koya, Kinpusenji Temple and Kinpu Shrine in the Yoshino and Omine area, and Omimesanji Temple.

In the process of being registered as a World Heritage Site, the region was especially highly praised for its cultural landscape, which developed through interactions between humanity and nature. In terms of notable universal value, the region was recognized as follows: "The monuments and ruins that form the cultural landscape of the Kii Mountain Range are unique products of the fusion of Shintoism and Buddhism, and are good examples of the exchange and development of religious cultures in East Asia."



UNESCO World Heritage Convention



Kumano Hongu Taisha



Kumano Hayatama Taisha

Giving to UTokyo

Message from The University of Tokyo Foundation



We are pleased to announce that the UTokyo Next 150 Fund, our university's core foundation fund, has reached a new milestone. This fund is essential for the continued growth and development of our research and education programs, and we believe that expanding it is crucial for the future of our university.

As we look forward to celebrating our 150th anniversary in 2027, we have set a goal of raising the fund balance to 20 billion yen by then. This fund is part of a 200 billion University endowment fund (pp. 24-25) that we aim to grow to 1 trillion yen in 25 years.

This 200 billion yen will be used to support various activities aimed at making UTokyo a place that everyone will want to visit.

We know that achieving this goal will not be easy, but we are confident that, with your support, we can make it happen. We believe that by working together, we can create a bright future for UTokyo and for the world.

Thank you for your continued support and dedication to our university.

Teruo Fujii
President, The University of Tokyo

	Special Honorary (JPY100,000,000+)	Honorary (JPY10,000,000+)	Special Contributing (JPY5,000,000+)	Contributing (JPY1,000,000+)	Special Supporting (JPY300,000+)	Supporting
Engraved name plaque displayed in the Yasuda Auditorium	Gold, large sized, prime location	Gold, medium sized, prime location	Silver, medium sized	Bronze, small sized	Bronze, small sized	—
Memorial plate	●	●	—	—	—	—
Annual report	●	●	●	●	●	●
Email magazine	●	●	●	●	●	●
Invitation to events	In exclusive setting		Invitations to various online and offline events e.g.) Donors and Scholars Event etc.			
Recommendation for the medal with dark blue ribbon (*1)	● Lump-sum donation	● Lump-sum donation	● Lump-sum donation			
Tax benefits(*2)	Japan residents			●		
	U.S. residents (*3)			●		
	Residents of other countries			—		
Project-based appreciation (*4)	See the project page: https://utf.u-tokyo.ac.jp/en#select					

Table 1. Donor Benefits
*1 Criteria for invitations vary for each event. / *2 Recommendations for the medal with dark blue ribbon are limited to lump-sum applications. Please note that this is not a cumulative donation amount. / *3 U.S. residents are eligible for tax benefits if they donate to UTokyo NY (501c3). / *4 Some projects may provide gifts, but we cannot ship them overseas. If you would like to receive gift items, please indicate a shipping address in Japan in the remarks column or use the contact form.

YOUR NAME	Special Honorary (JPY100,000,000+)	W145xH54 (mm)	Colored stainless steel / gold hairline facing
YOUR NAME	Honorary (JPY10,000,000+)	W145xH27 (mm)	Colored stainless steel / gold hairline facing
YOUR NAME	Special Contributing (JPY5,000,000+)	W145xH27 (mm)	Stainless steel hairline facing
YOUR NAME	Contributing (JPY1,000,000+)	W145xH20 (mm)	Copper / bronze facing
YOUR NAME	Special Supporting (JPY300,000+)	W145xH20 (mm)	Copper / bronze facing

Table 2. Donor Plaque Details

The Student Supporters Club Scholarship

The Student Supporters Club Scholarship is UTokyo's unique face-to-face scholarship. It provides support for two years to students who are outstanding and have the potential to become future leaders but are financially needy. At the annual scholarship event, you can directly listen to students' research presentations, ask questions, and offer words of encouragement to them.



Students' Voices

- Seeing the supporters' faces encouraged me in my research.
- I could brace myself up by directly seeing who is supporting me.
- I was inspired to work harder by listening to other students' presentations and meeting the supporters in person.
- I was glad to interact with the supporters and know what they are like.

Supporters' Voices

- It was good to hear directly from hopeful students.
- I could realize how my support would be helpful by listening to the specifics of the students' research and asking questions directly.
- I have been exposed to various fields of research and world issues that I would never have contact with alone.
- I hope this movement grows!

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Into a Sea of Diversity: Creating the Future through Dialogue

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April 2023



Website of UTokyo

