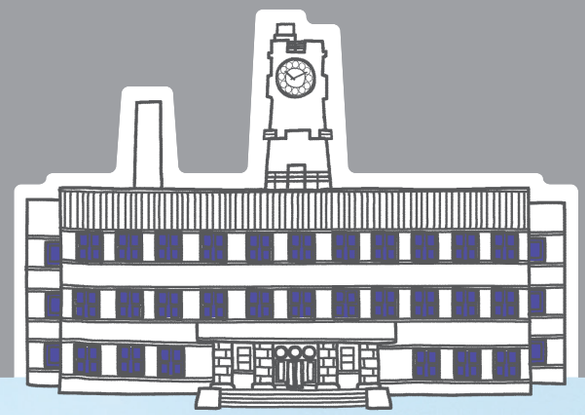
RESEARCH CENTER 2019 FOR ADVANCED SCIENCE AND TECHNOLOGY

東京大学 先端科学技術研究センター
Research Center for Advanced Science and Technology
The University of Tokyo

Building 1

This building houses a large wooden wind tunnel, where experiments started in 1930. The facility is a crucial part of Japan's aviation history. In January 2019, the wind tunnel was granted Important Aviation Heritage certification by the Japan Aeronautic Association.



The Research Center for Advanced Science and Technology shall aim to contribute to the development of science and technology by expeditiously taking on new challenges arising from the advancement of science and changes in society thereby exploring new areas of advanced science and technology for humankind and society.

Article 2,
Rules for the Research Center for Advanced Science and Technology,
the University of Tokyo

Director
Research Center for Advanced Science and Technology
the University of Tokyo

Ryohei Kanzaki

The Research Center for Advanced Science and Technology (RCAST) is a place where people can achieve their full potential without barriers.

Founded in 1987, RCAST has accomplished the practical integration of sciences and arts across a wide range of research fields, including information, environment and energy, materials, chemical biomedicine, barrier-free, and social science. It is now a core driving force in achieving United Nations Sustainable Development Goals (SDGs) and creating an inclusive society. RCAST takes pride in its strengths in research and collaboration, and has drawn attention as one of the highest-level centers of its kind. As the first director of RCAST who is to serve for two consecutive terms, my mission is to combine and leverage all the elements of this rich integration to produce the greatest results possible.
In my first term, which ended with the 2018 academic year, RCAST launched the UTokyo-Research Alliance for Information and Life Sciences, which enables promising early-career researchers to excel; the Co-creation Living Lab, a research hub that has upgraded conventional collaboration between local governments and RCAST; and the multidisciplinary Inclusive Design Lab, which aims to create environments and spaces where people with disabilities, seniors, children, and others can attain their full potential.
In science and technology, there is a tendency to seek a single optimal and standardized solution for a problem. However, no individual in society perfectly fits any one particular standard. An inclusive society should offer diverse solutions, and the question is whether or not we can contribute to society by creating such solutions. The key is to be found in sensitivity to the beauty of diversity, cultivated through art and design.
Art and design have always formed part of RCAST's barrier-free studies, and we have a range of experts in these fields. Moving forward, through international collaboration we will re-examine science and technology with art and design experts to generate ideas for world-class inclusive environments, and put these ideas into practice in society.

Building 3 South

The newest building at RCAST was designed with an eye to continuity with other buildings on the campus.
In addition to the Academic-Industrial Joint Laboratory for Renewable Energy, it houses environment and energy labs. The ENEOS hall on the first floor seats 170.

INTERDISCIPLINARY, INCLUSIVE APPROACH

Thirty Years of Interdisciplinary Research and a 15-year Focus on Inclusivity

Resolutions to increasingly complex social issues require fresh perspectives. Having the foresight to pursue fields where there is no existing research is part of RCAST's DNA. Since the center was founded over 30 years ago, science and engineering have co-existed with humanities and social sciences, which deal with ethics, thought, and social systems.
In barrier-free studies established more than 15 years ago, research into barrier-free solutions leverages technology to overcome human and social barriers.

Field-specific Laboratories

A field-specific laboratory structure enhances researchers' originality and generates synergy. This structure aims to encourage interdisciplinary collaboration through unanticipated interactions among researchers from different disciplines, while enhancing the creativity of individual researchers.
Repeated interactions with researchers from different fields contribute to fruitful discussions in interdisciplinary projects. This synergy is generated by RCAST's hallmark interdisciplinary research.

UNIQUE LINE-UP

World-renowned Researchers, Artists–and a Bear

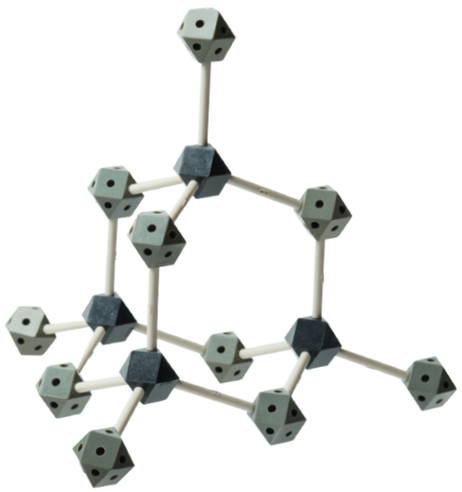
At RCAST, we are proud to be joined by top researchers from around the world. We also have researchers with disabilities, artists and athletes. Coming into contact with such a diverse range of viewpoints prompts us to question things taken for granted in our own narrow world. In June 2018, Kumamon, the popular bear mascot of Kumamoto Prefecture joined RCAST's research team. Who will be next?

INTERACTION

The sole UTokyo-affiliated institution offering graduate-level education to outside professionals

Corporate researchers and specialist personnel increasingly require doctoral degrees. Universities not only enable in-depth study of a chosen field, but also develop a systematic understanding and broad overview of science and technology. A cutting-edge environment that brings students into close contact with interdisciplinary research, researchers from diverse backgrounds, and ground-breaking joint research projects is ideal for high-level training of corporate researchers who are tackling increasingly complex social issues.

EDUCATION



HAPPY HOUR

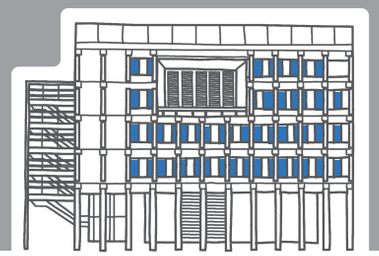
A mingling of minds

Laboratories hosting Happy Hours come up with entertaining drawcards every month, such as games or soup-tasting. Participants make face-to-face connections with people they may know only through e-mails or casual greetings. Such ease of communication spanning research fields and job roles is another point of pride at RCAST.

Researchers are good communicators

RCAST researchers enthusiastically convey the fun and challenge of their research via Research Tours for junior and senior high school students that feature lab visits and lectures. Researchers also enjoy communicating their latest efforts in unique events at the Komaba Research Campus Open House, which targets a broad public audience.

OUTREACH ACTIVITIES



Building 14

This building has rich historical value on a par with that of Building 13. At lunchtime, food trucks gather between those two buildings to set up their stalls. Café seminars and a monthly Happy Hour are held in the RCAST Café on the 1st floor.

When laboratories with unique strengths pool their creativity, projects are super-charged

Each unique laboratory pursues its own large-scale projects and engages in interdisciplinary projects where multiple laboratories collaborate to try out new approaches.

INCLUSIVITY

Inclusive Design Lab

RCAST has various science and engineering laboratories, and many researchers with disabilities work in these facilities. In collaboration with the UTokyo Disability Services Office, we develop guidelines for accessible environments in science laboratories and support students with disabilities in pursuing higher education and careers in STEM fields.

UTokyo-Research Alliance for Information and Life Sciences

An aggregate of young researchers with differing expertise in fields ranging frombiology and medicine to information science, chemistry, and engineering generates collaborative research in an open laboratory, sharing core facilities and cutting-edge technologies. This project aims to tackle fundamental life science problems such as cancer progression and disease control, while exploring industrial applications of scientific discoveries.

UTOKYO-RAILS

IDEA Project

The IDEA project has developed an ultra-short working hours scheme for people with disabilities, starting from as little as 15 minutes of work per week. In 2017, SoftBank Corporation was awarded a Good Design Special Award for the Short Working Hours Program supported by the IDEA project.

SUSTAINABLE COMMUNITIES

Co-creation Living Lab

Knowledge of cutting-edge science and technology combined with regional collaboration networks built up over many years enable us to conceive strategies and tools pinpointing regional issues and design the sustainable regional communities of the future.

ULTRA-SHORT WORKING HOURS

GREATER DIVERSITY

DO-IT Japan

This project supports students with disabilities to learn about technology and consider self-advocacy, disability issues, and self-determination, encouraging students to become leaders in society and empower others. It also provides transition support for study and employment.

Commitment to SDGs Defines RCAST

No other research institute fuses humanities and science in more than 40 fields of research within a small organization of around 700 people, including students. We believe that by leveraging the diversity and uniqueness of RCAST, we can commit to all of the SDGs.

SUSTAINABLE DEVELOPMENT

SUSTAINABLE DEVELOPMENT GOALS

Labs named for a wide variety of specialized fields are engaged in dynamic research activities

Materials
- Micro Device Engineering
- Quantum Information Physics and Engineering
- Theoretical Chemistry
- High Performance Materials

Environment and Energy
- New Energy
- Climate Science Research
- Co-creative Community Planning, Design and Management
- Energy System
- Global Climate Dynamics
- Academic-Industrial Joint Laboratory for Renewable Energy

Information
- Artificial Intelligence
- Information Devices
- Intelligent Cooperative Systems
- Mathematical Physics of Emergence Systems
- Photon based Advanced Manufacturing Science
- Information Somatics
- Communication Science
- Biological Data Science
- Networked Biophotonics and Microfluidics
- Machine Intelligence

Chemical Biomedicine
- Bioorganic Chemistry
- Genome Science
- Metabolic Medicine
- Synthetic Biology
- InItegrative Nutriomics and Oncology
- Clinical Epigenetics

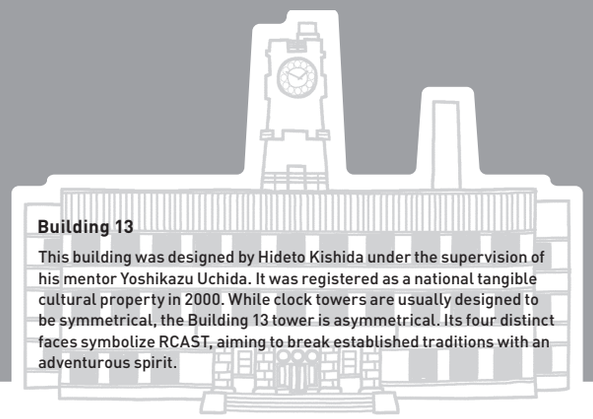
Barrier Free
- Barrier-Free
- Assistive Technology
- Tojisha-Kenkyu

Social Science
- Intellectual Property Law
- Political Administrative System
- Religion and Global Security
- Policy Research on Science and Technology

Cooperative Laboratories
- Information, Culture and Social Studies
- MOT (Management of Technology)
- Energy and Environment
- Chemical Biotechnology

Social Cooperation Research Departments
- Crowd Management
- Renewable Fuels Global Network
- Department of Inflammology

Corporate Sponsored Research Programs
- Progressive Logistic Science

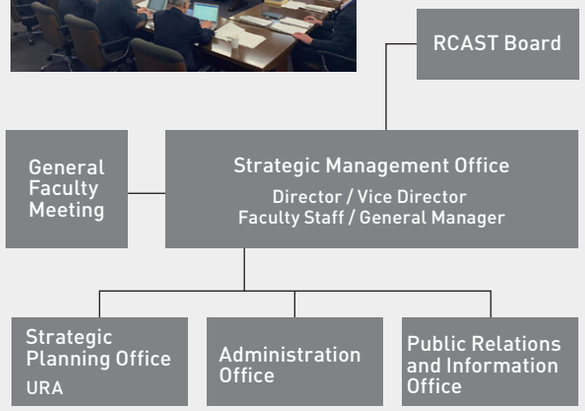


Building 13

This building was designed by Hideto Kishida under the supervision of his mentor Yoshikazu Uchida. It was registered as a national tangible cultural property in 2000. While clock towers are usually designed to be symmetrical, the Building 13 tower is asymmetrical. Its four distinct faces symbolize RCAST, aiming to break established traditions with an adventurous spirit.

A unique system of operation that enables prompt decisions to address new challenges

A top-down decision-making system that facilitates prompt action enables RCAST to create new, world-leading research domains. Since its inception, RCAST has maintained a unique system of operations so that researchers can devote themselves to their research activities. As a core unit with primary responsibility for various aspects of operations, the Strategic Management Office deals with matters related to internal organizational streamlining, staffing proposals, and budget allocation and execution. The system reduces the amount of time researchers spend on operational issues and ensures time for their research activities.



Support services field fast-emerging and tricky issues

According to RCAST Director Ryohei KANZAKI, “Our researchers and our administrative staff are the twin engines driving RCAST’s continued success.” An operating structure reliant on prompt action needs speedy and flexible support.

Rigorous evaluation of RCAST’s management strategies “RCAST Board” external evaluation committee

RCAST Board

Noriko OSUMI
Vice President,
Tohoku University

Takashi ONISHI
President,
Toyohashi University of Technology

Hideaki KOIZUMI
Honorary Fellow, Hitachi, Ltd.
Executive Vice President,
The Engineering Academy of Japan

Yoshimitsu KOBAYASHI
Director of the Board, Chairperson,
Mitsubishi Chemical Holdings Corporation

Tsuneo KOMATSUZAKI
Advisor, SECOM CO., LTD.

Yoichi NISHIMURA
Managing Director,
The Asahi Shimbun Company

Akira HIRUMA
President and CEO,
Hamamatsu Photonics K.K.

Hiroya MASUDA
Advisor, Nomura Research Institute

Toshiro MUTOH
Honorary Chairman,
Daiwa Institute of Research Ltd.

[As of April 1, 2019]

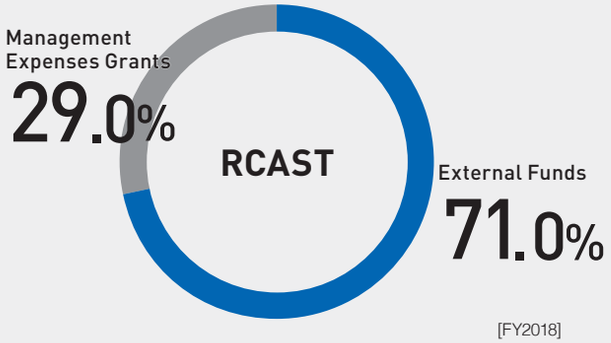
RCAST at a glance

Our high external funding ratio is evidence of our research competency expectations and results

Over 70 percent of RCAST's operating expenses are covered by external funding. This reflects recognition of RCAST’s far-sighted research and the results that it has produced, and a line-up of researchers capable of securing their own funding.

External Funding Ratio

Proportion of Management Expenses Grants to External Funds



[FY2018]

UTokyo

Management Expenses Grants 48.0% | External Funds 52.0%

Source：The University of Tokyo Data Book 2019

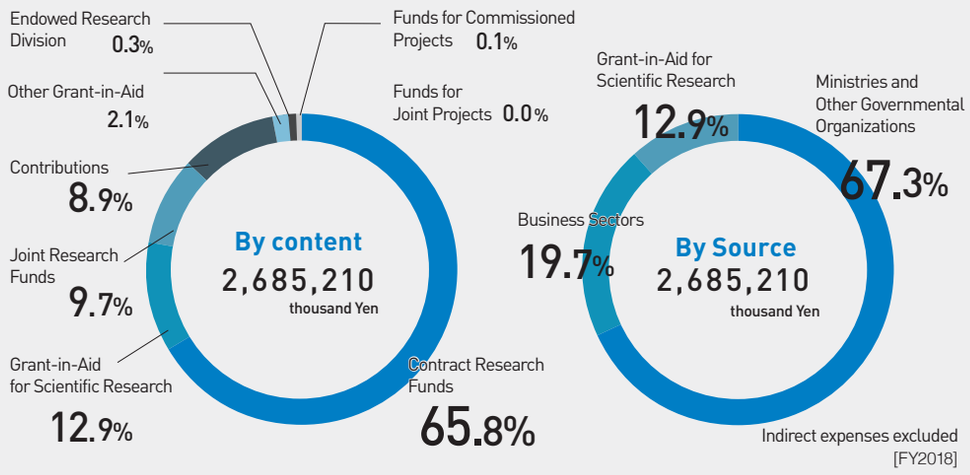
Financial Statement for FY 2018

Management Expenses Grants
1,277,040 thousand Yen

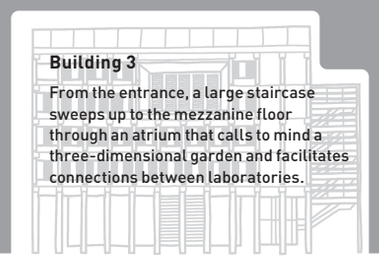
External Funds
3,133,923 thousand Yen

Grand Total
4,410,963 thousand Yen

External funds



Indirect expenses excluded
[FY2018]



Building 3

From the entrance, a large staircase sweeps up to the mezzanine floor through an atrium that calls to mind a three-dimensional garden and facilitates connections between laboratories.

Global and domestic organic connections create new forms of network

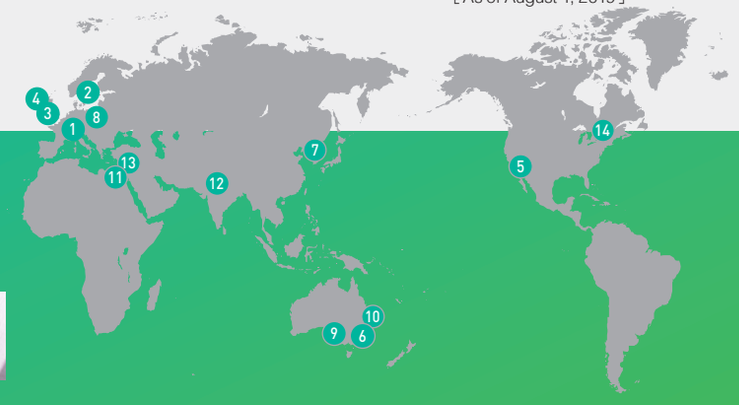
Globally, RCAST researchers cooperate with world-class partners, sometimes working beyond their disciplines. They seek to advance their research via wide-ranging networks encompassing not only people-to-people exchanges, but also global academic exchange agreements.
Domestic initiatives are exemplified by a partnership agreement with Ishikawa Prefecture that has led to a very advanced example of joint industry creation.
In collaboration with local governments and communities participating in the Co-creation Living Lab, RCAST pursues forms of co-creation that go beyond conventional industry-academia-government cooperation.

International collaboration

1. Centre National de la Recherche Scientifique (CNRS) (France)
2. Stockholm University (Sweden)
3. Clare Hall, University of Cambridge (UK)
4. University of Glasgow (UK)
5. Arizona Initiative for Renewable Energy, Arizona State University (USA)
6. The University of New South Wales (Australia)
7. Advanced Institutes of Convergence Technology (AICT), Seoul National University (Korea)
8. University of Kassel (Germany)
9. The University of Adelaide (Australia)
10. Queensland University of Technology (Australia)
11. The Moshe Dayan Center for Middle Eastern and African Studies (MDC), Tel Aviv University (Israel)
12. Council of Scientific & Industrial Research (CSIR) (India)
13. The Hebrew University of Jerusalem (Israel)
14. Centre for Research in Photonics, The University of Ottawa (Canada)

*Chronological order of agreements conclusion

[As of August 1, 2019]



RCAST Fellow

- Ping CHANG (Texas A&M University)
- Jacob M. TAYLOR (University of Maryland)
- Stefania BANDINI (University of Milan-Bicocca)
- David COPE (University of Cambridge)
- Shang-Ping XIE (Scripps Institution of Oceanography, University of California)
- Joerg WUNDERLICH (Hitachi Cambridge Laboratory)
- Tsutomu MIYASAKA (Toin University of Yokohama)
- Toshio FUJITA (UTokyo Emeritus Professor)
- Teruo KISHI (Science and Technology Advisor to the Minister of Foreign Affairs)
- Hideaki KOIZUMI (Honorary Fellow, Hitachi Ltd. / Executive Vice President, The Engineering Academy of Japan)
- Setsu ITO (Studio Ito Design)

RCAST Adviser

- Yasunori BABA
- Kiyoshi NISHIOKA
- Mariko FUJII

[As of April 1, 2019]

Agreement with domestic local governments

1. Ishikawa Prefecture and Ishikawa Sunrise Industries Creation Organization (2012)
2. Obuse Town, Nagano Prefecture (2016)
3. Kumamoto Prefecture and Kumamoto University (2017)
4. Karuizawa Town, Nagano Prefecture and Shinshu University Research Center for Social Systems (2017)
5. Iwaki City, Fukushima Prefecture (2018)
6. Shiraoi Town, Hokkaido Prefecture (2019)
7. Wakayama Prefecture (2019)
8. Eiheiji Town, Fukui Prefecture (2019)
9. Nanyo City, Yamagata Prefecture (2019)
10. Kobe City, Hyogo Prefecture (2019)

[As of August 1, 2019]

Clare Hall, University of Cambridge – Asia Partners –

RCAST sends researchers to Clare Hall, where they are granted the title Clare Hall Visiting Fellow. We also send students from the Department of Advanced Interdisciplinary Studies as visiting students. Both carry out collaborative research.

All projects differ in uniqueness of research and education

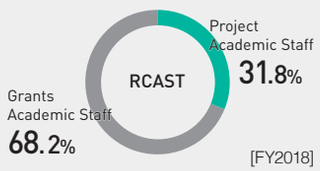
With external funding, RCAST has created the Project Researcher/Faculty System enabling unique, high-quality human resources to be employed by RCAST on a project basis. This system, originated by RCAST, can make a huge difference in research competency.

The ratio of Project Academic Staff

	RCAST	UTokyo
Professors	11.1%	6.4%
Associate Professors	40.0%	16.8%
Lecturers	57.1%	33.3%

[FY2018]

Composition ratio of Academic Staff



[FY2018]

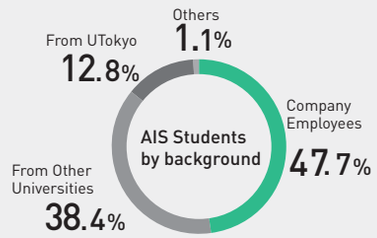
UTokyo

Grants Academic Staff 85.6% | Project Academic Staff 14.4%

Source(UTokyo) : The University of Tokyo Data Book 2019

About half our graduate school students are adults who study while working

The Department of Advanced Interdisciplinary Studies (doctoral course), has comprehensive systems to welcome those who wish to continue working during their studies.



*Attribution is as per status at time of application. In the case of foreign students, final education (excluding company employees).

[As of February 1, 2019]

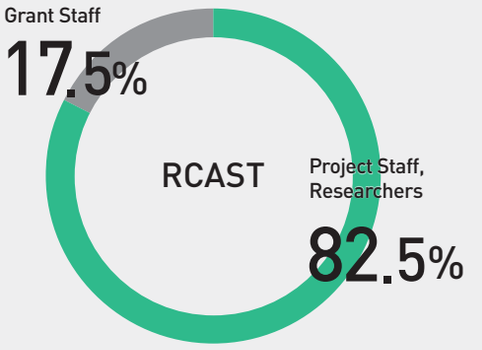
The member of Faculty and Staff

Academic Staff		**360**
Grant Staff	63	
Project Staff	43	
Researchers*	254	
Administrative Staff		**49**
Grant Administrative Staff	26	
Project Specialists	23	
Students		**285**
Graduate Students	255	AIS Students 86
Undergraduate Students	30	

*Researchers: Project Researchers, Visiting Research Fellows, Co-operative Research Fellows, UTokyo Research Fellows, Joint Research Fellows

[As of February 1, 2019]

The ratio of Research Staff



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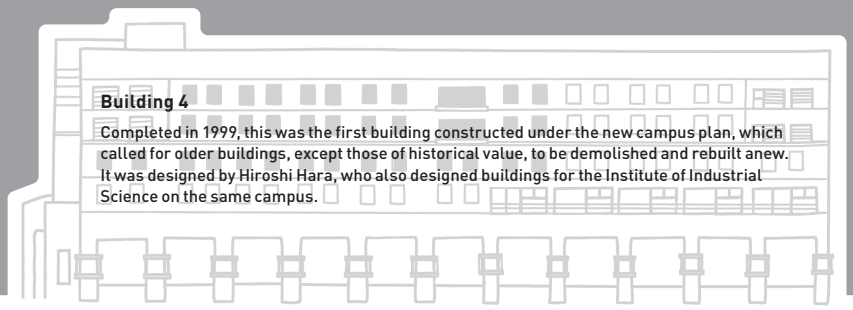
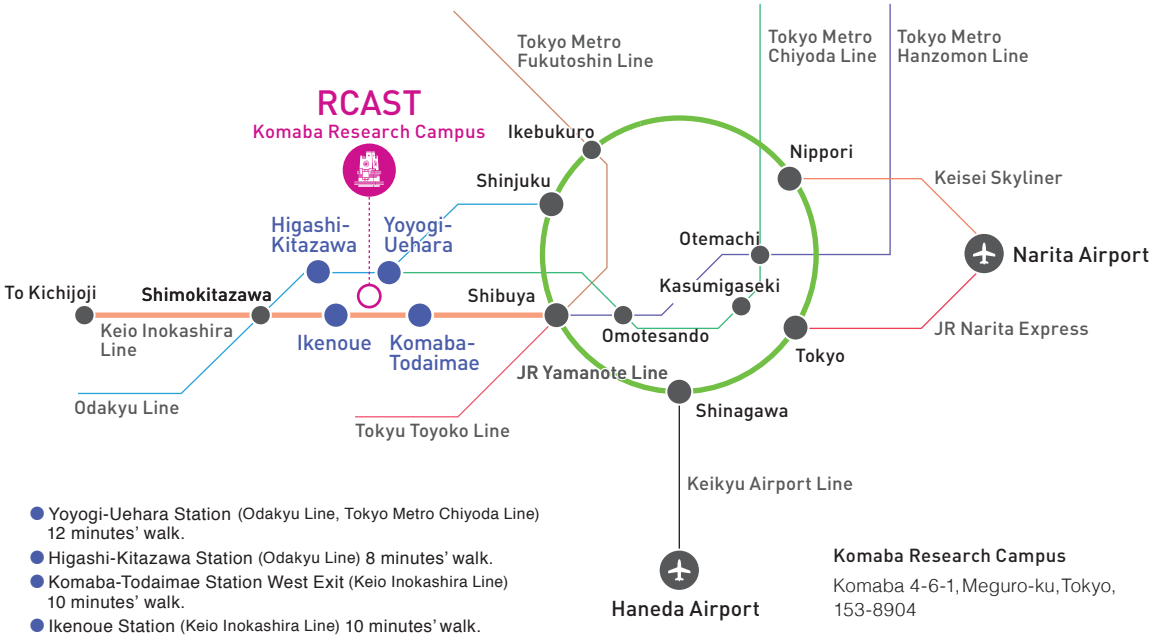


Building 4

Completed in 1999, this was the first building constructed under the new campus plan, which called for older buildings, except those of historical value, to be demolished and rebuilt anew. It was designed by Hiroshi Hara, who also designed buildings for the Institute of Industrial Science on the same campus.

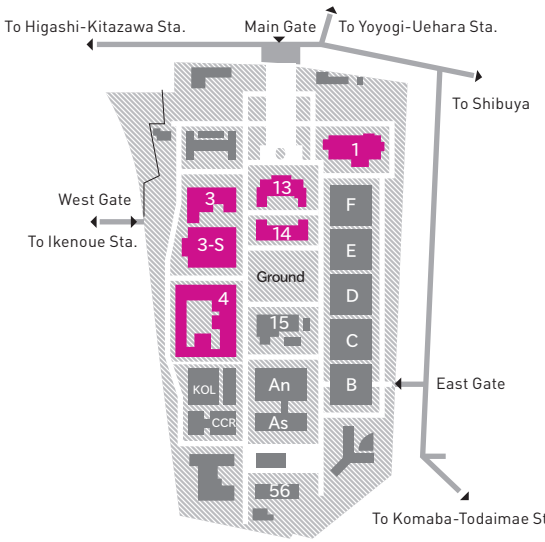
ACCESS



- Yoyogi-Uehara Station (Odakyu Line, Tokyo Metro Chiyoda Line) 12 minutes' walk.
- Higashi-Kitazawa Station (Odakyu Line) 8 minutes' walk.
- Komaba-Todaimae Station West Exit (Keio Inokashira Line) 10 minutes' walk.
- Ikenoue Station (Keio Inokashira Line) 10 minutes' walk.

Komaba Research Campus
Komaba 4-6-1, Meguro-ku, Tokyo, 153-8904

Komaba Research Campus




Building 13


Building 1


Building 3


Building 3 South


Building 4


Building 14

■ Research Center for Advanced Science and Technology

東京大学 THE UNIVERSITY OF TOKYO
東大先端研 Research Center for Advanced Science and Technology The University of Tokyo

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Financial support for research challenges

Your donations are invaluable in helping us to extend creative research activities and accelerate our efforts to solve society's problems.