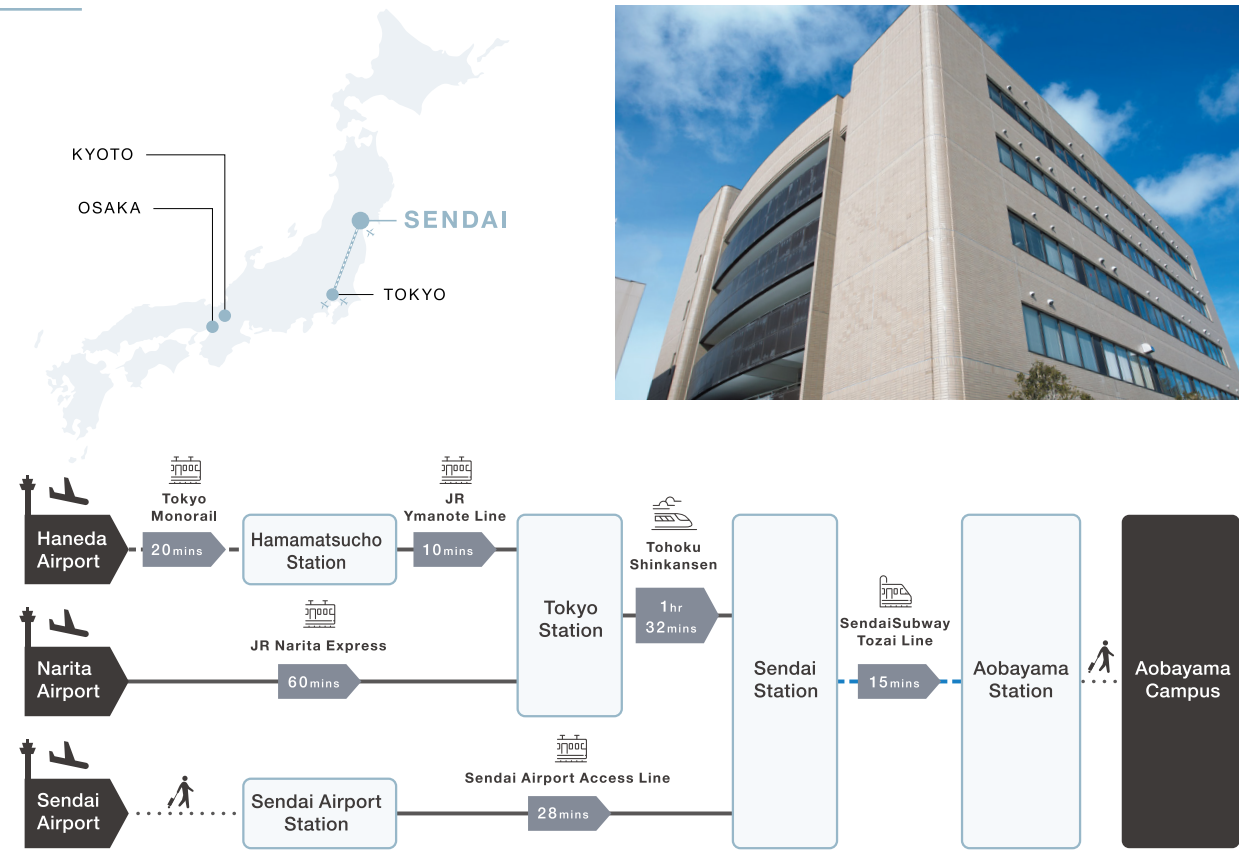
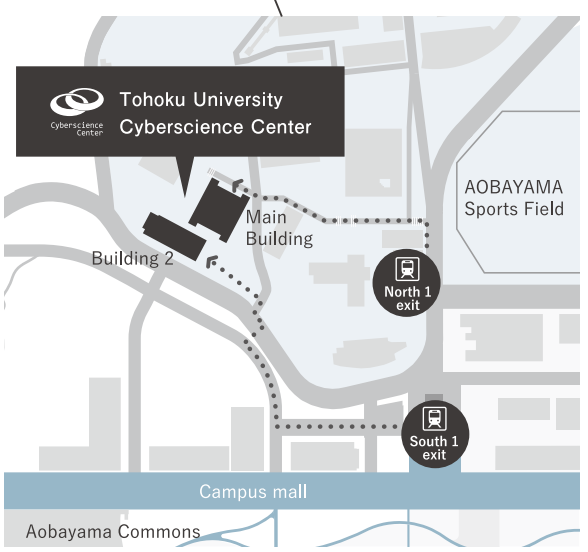
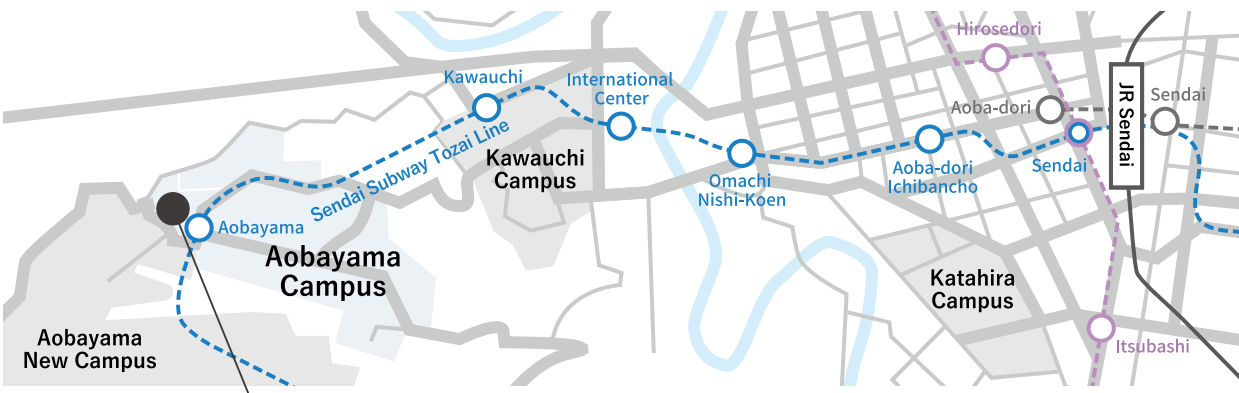


Access

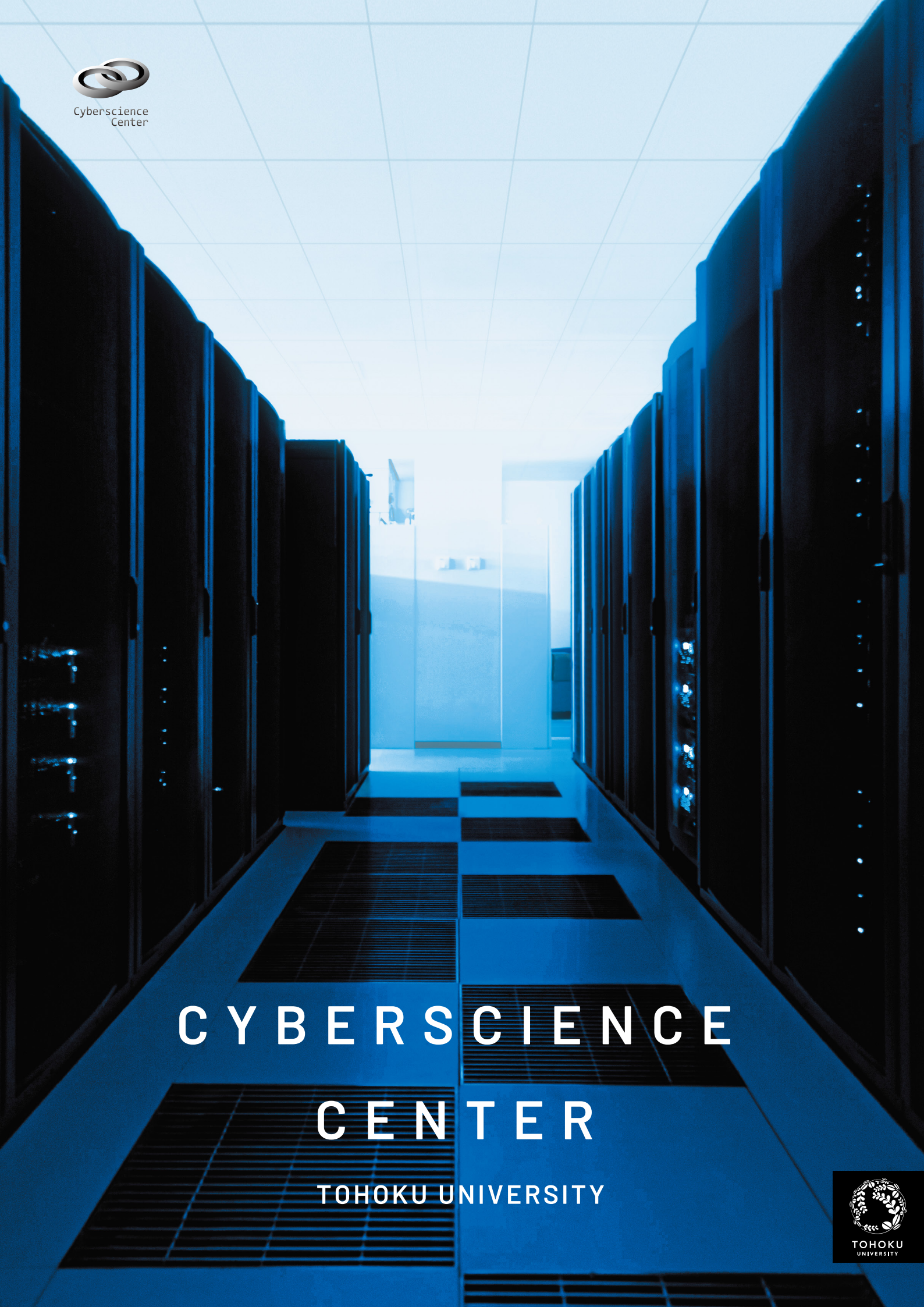


Tohoku University Aobayama Campus



Access from Sendai Station
Subway(Sendai Subway Tozai Line)
From "Sendai" Station, take the Subway bound to "Yagiyama Zoological Park".
Get off at "Aobayama" station. From "Sendai" Station to "Aobayama" Station takes about 9 minutes.

 **Tohoku University**
Cyberscience Center
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CYBERSCIENCE
CENTER
TOHOKU UNIVERSITY





Cyberscience Center
Tohoku University
Takuo Suganuma
Director

At Cyberscience Center, we are committed to the Research and Development (R&D) of fundamental technologies, using Information and Communications Technology (ICT) to support data-driven research and education and to develop practical and interdisciplinary human resources.

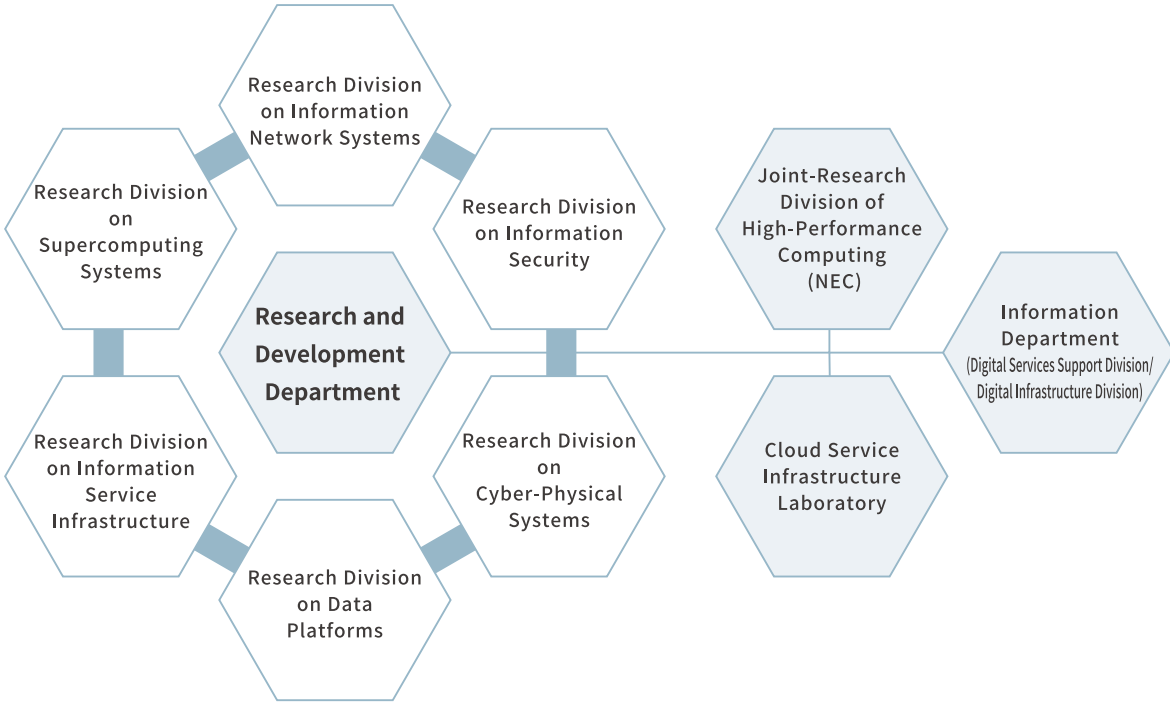
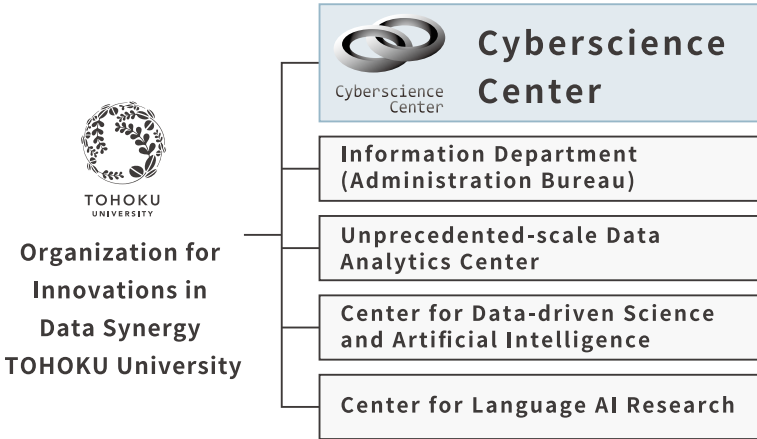
The Center for Large-Scale Computing, the predecessor of the Cyberscience Center, was established in 1969 as a national joint facility for university faculty and other researchers. Since then, this Institution has continued to provide large-scale scientific computing and networking services to researchers within and outside Tohoku University. The Center is currently an on-campus joint facility for Interdisciplinary Large-scale Information Infrastructures (a.k.a. JHPCN), contributing to nationwide research and education. Moreover, the Center plays a key role in maintaining and operating the information infrastructure at Tohoku University to promote data-driven Digital Transformation (DX).

Providing high-performance computing and networking infrastructures is critical to support research, administrative, and academic activities. Therefore, the Center promotes research on networking services and operations, and the results are used within and outside Tohoku University. Specifically, the Center conducts R&D on maintaining, operating, and utilizing the world’s most advanced large-scale scientific computing systems and state-of-the-art networking infrastructure. In addition, as part of the Graduate School of Information Sciences, the Graduate School of Engineering, and the Graduate School of Biomedical Engineering, we have expanded our scope and made academic contributions in fields such as Information and Communication and Computer Science and their applications. We are working to enhance cooperation with high-performance computing research communities and develop collaborative frameworks related to advanced information infrastructures with domestic and international research institutions.

We will make full use of our pragmatic research and educational environment of information and communication technology to research and develop fundamental technologies that support data-driven research and education, and to foster practical and interdisciplinary human resources. We are looking forward to working with you to achieve our goal of supporting Data-driven R&D and fostering practical and interdisciplinary human resources. Thank you for your continued support.

The Cyberscience Center is a central hub for promoting advanced informatization at Tohoku University. It conducts research and development to promote informatization for research, education, and other purposes. Additionally, it is responsible for the maintenance and operation of information infrastructure.

The Cyberscience Center, which is a part of the Organization for Innovations in Data Synergy Tohoku University, is responsible for developing and operating the information infrastructure that supports data-driven research and education at the university. The Center’s Research and Development Department conducts research and development on the maintenance, operation, and application of state-of-the-art information infrastructure. It is also actively engaged in education as a cooperative course of the University’s Graduate School, making academic contributions and fostering human resources in the fields of information and communication, computer science, and medical applications.



Nov. 1967	Large-scale computer center completed at Katahira Campus	
Dec. 1994	Center moved from Katahira Campus to Aobayama Campus	
Apr. 2001	Reorganized as the Information Synergy Center	
Apr. 2006	Reorganized as Information Synergy Center of the Information Synergy Organization	
Apr. 2008	Reorganized as CyberScience Center	
Mar. 2009	StarTAINS operation started	
Jun. 2009	Authorized as a Joint Usage/Research Center for Interdisciplinary Large-Scale Information Infrastructures	
Mar. 2010	Exhibition room is accredited as a Satellite Museum of the Historical Computers by the Information Processing Society of Japan	
Nov. 2014	Construction of CyberScience Center Building 2 completed	
Oct. 2020	Supercomputer Aoba begins operations	
Jan. 2022	Research and Development Department reorganized	

Supercomputing System

Our supercomputer named AOBA is a nationwide joint-use system for academic research by scientists affiliated with universities or research institutes across Japan. AOBA offers state-of-the-art high-performance computing capabilities to accelerate scientific discoveries. AOBA consists of three subsystems: AOBA-S, AOBA-A and AOBA-B.

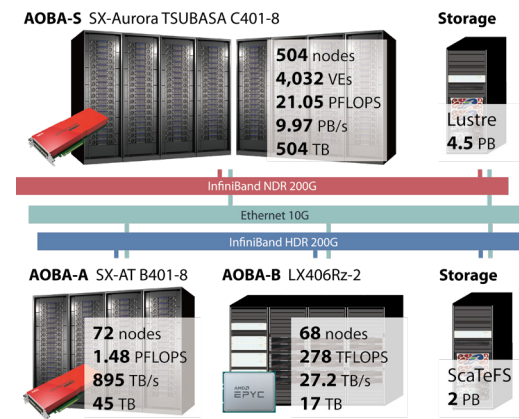
AOBA-S

AOBA-S is a vector supercomputer equipped with 4,032 third-generation Vector Engine processors and is the world's most powerful vector supercomputer as of October 2023. The AOBA-S subsystem provides 21.05 PFLOPS of peak computing performance, 9.97 PB/s of peak memory bandwidth, and 504 TB of total memory capacity. The synergetic combination of high bandwidth memory and advanced autovectorizing compiler offers high performance and efficiency in executing memory-intensive applications, enabling previously infeasible extreme-scale simulations.



AOBA-A/B

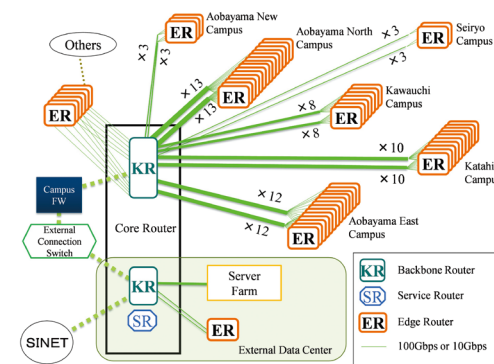
AOBA-A, like AOBA-S, is a vector supercomputer employing Vector Engine processors, while AOBA-B is a scalar supercomputer employing x86-64 processors. AOBA-B allows efficient execution of commercial applications and programs unsuitable for vectorization. AOBA-A and B share the same parallel file system, enabling workflows that span the two supercomputers, such as running a simulation on AOBA-A and visualizing the simulation result on AOBA-B.



Since April 2024, Supercomputer AOBA at the Cyberscience Center has been directly connected to NanoTerasu via a high-speed network, enabling the archival and analysis of huge amounts of experimental data. Going forward, AOBA is expected to significantly contribute to a wider range of research fields such as data-driven science, material development, drug discovery, and agriculture as well as traditional scientific computing.

Tohoku University Academic/All-round/Advanced Information Network System

The Cyberscience Center plays a key role in developing and maintaining TAINS (Tohoku University Academic/All-round/Advanced Information Network System). TAINS has been in service since 1988 and was the first large-scale campus-wide network in Japan. Its successor, StarTAINS, has been operational since 2009 and links the center to all major buildings across six campuses: Katahira Campus, Kawauchi Campus, Aobayama North Campus, Aobayama East Campus, Aobayama New Campus, and Seiryō Campus. It is linked to SINET, the information infrastructure for universities and research institutions nationwide, via the external data center where the server farm is located.



Contribution to the local-area network

The Cyberscience Center contributes to running the Tohoku Open Internet Community (TOPIC). TOPIC is a group that was established in 1992 to support the development of computer network environments for academic research and educational activities in the Tohoku region. The group has been organizing events such as lectures and training sessions for participating institutions.

The Cyberscience Center is fully committed to the development of its relevant field and the cultivation of human resources based on practical and interdisciplinary approaches, taking advantage of its characteristics as a clinical research and education field for information and communication technology.

Research and Development Department	<ul style="list-style-type: none">•Research Division on Information Network Systems•Research Division on Supercomputing Systems•Research Division on Information Security•Research Division on Information Service Infrastructure•Research Division on Cyber-Physical Systems•Research Division on Data Platforms
Joint-Research Division	<ul style="list-style-type: none">•Joint-Research Division of High-Performance Computing (NEC)
Other Divisions	<ul style="list-style-type: none">•Cloud Service Infrastructure Laboratory

Research Division on Information Network Systems

This division is engaged in R&D related to the planning, operation, management support, and enhancement of the University's information network system. We are also engaged in R&D of advanced information and communication infrastructure and its operation and advanced utilization, as well as basic theoretical research on information security.

<http://www.ci.cc.tohoku.ac.jp/>



- Member
- Professor Takuo Suganuma
 - Associate Professor Hideaki Goto

Research Division on Supercomputing Systems

Providing the leading-edge computing environment with our supercomputers, we undertake research on fundamental hardware and software technologies enabling next-generation supercomputing, and also on design and development of innovative applications that can fully exploit the potential of supercomputers.

<https://www.hpc.is.tohoku.ac.jp/home-en/>



- Member
- Professor Hiroyuki Takizawa
 - Specially Appointed Researcher Tatsuyoshi Ohmura
 - Specially Appointed Researcher Yoichi Shimomura
 - Academic Researcher Jiaheng Liu
 - Visiting Professor Ryusuke Egawa
 - Visiting Associate Professor Keichi Takahashi

Research Division on Information Security

We engage in research related to cryptography and cryptology, which are essential for safeguarding information security. Specifically, we devise, develop, and model physical cryptographic protocols that use tangible tools, such as a deck of playing cards, to perform secure computations, zero-knowledge proofs, and other cryptographic techniques. In addition, we explore the limits of card-based computation.

<https://sites.google.com/tohoku.ac.jp/mizuki-lab>



Member

- Professor
Takaaki Mizuki

Research Division on Information Service Infrastructure

This division conducts R&D on the planning, operation, and management support for the University's information service infrastructure, as well as on their advanced utilization.

We are also conducting R&D of multidimensional information infrastructure technology based on the coordination and harmonization of various components to realize a new communication environment in which the diverse entities that make up humans, society, and the environment can interoperate with each other at a high level.

<http://www.ci.cc.tohoku.ac.jp/>



Member

- Professor
Takuo Suganuma
- Associate Professor
Toru Abe
- Assistant Professor
Guillen Barja,
Luis Alberto

Research Division on Cyber-Physical Systems

Our laboratory is engaged in research on cyber-physical systems that can aggregate and analyze real-world sensory information, effectively providing feedback to the physical world. We are actively developing technologies such as advanced measurement, image analysis, and virtual reality systems for applications in the fields of medicine, health, and welfare.

<https://web.tohoku.ac.jp/cps-cc/>



Member

- Professor
Norihiro Sugita
- Academic Researcher
Makoto Yoshizawa

Research Division on Data Platforms

To support advanced data-driven education and research for Tohoku University and related organizations, we provide support for planning, operation, and management of data platforms that enable efficient collection, storing, management, analysis, and utilization of education and research data, as well as engage research and development of related technologies. We also promote research and development on advanced technologies such as high-performance, large-capacity, highly reliable, and highly functional data lakes, storage systems, and cloud storage that contribute to the advancement of data platforms.

<https://web.tohoku.ac.jp/dp-cc/>



Member

- Professor
Takaki Nakamura
- Specially Appointed
Associate Professor
Satoshi Munakata

Joint-Research Division of High-Performance Computing (NEC)

This division has been established in 2014 as a core center of Tohoku University-NEC cooperation on high-performance computing. The research topics include migration and optimizations of laboratory-developed science and engineering applications to the level of high performance on the supercomputing systems of Tohoku University. In addition, the faculty members of the division work with researchers and engineers outside Tohoku University, especially from the industry, invited as Visiting Professors, Visiting Associate Professors, and Visiting Researchers, and promote joint-research projects regarding next-generation supercomputing systems development.

<https://www.hpc.cc.tohoku.ac.jp/>



Member

- Professor
Hiroaki Kobayashi
- Professor
Hiroyuki Takizawa
- Specially Appointed Professor
Kazuhiko Komatsu
- Associate Professor
Masayuki Sato
- Visiting Professor
Ryusuke Egawa
- Visiting Professor
Mitsuo Yokokawa
- Visiting Professor
Akihiro Musa
- Visiting Associate Professor
Shintaro Momose

Cloud Service Infrastructure Laboratory

The CSI laboratory is conducting research and development to build access networks and cloud infrastructures for Research and Education institutions. In collaboration with the National Institute of Informatics and GÉANT in Europe, we are working on the dissemination and the advancement of eduroam, the international academic wireless LAN roaming system.

In addition, through collaboration with domestic and overseas telecom companies, we are doing development and social implementation of convenient, secure, and disruption/disaster-tolerant network roaming and related cloud services.

<https://www.imglab.org/>



Member

- Associate Professor
Hideaki Goto

Exhibition room

Cyberscience Center Exhibition Room (The Satellite Museum of the Historical Computers)

Tracing the Transition of Computer and Network Technologies

Although there are no museums dedicated to computers in Japan, many organizations and institutions collect and exhibit valuable materials related to computer science, albeit on a small scale.

The Cyberscience Center Exhibition Room, located at Tohoku University, is certified as a distributed computer museum by the Information Processing Society of Japan. The exhibition room showcases the transition of computer and network technologies, and the history of the Center since its establishment as the Tohoku University Large-Scale Computer Center in 1969.

Information Processing Society of Japan Website
<https://museum.ipsj.or.jp/satellite/index.html>



How to visit

This exhibition room is open to visitors. If you wish to visit, please contact us at the following e-mail address:

E-mail: cc-uketuke@grp.tohoku.ac.jp