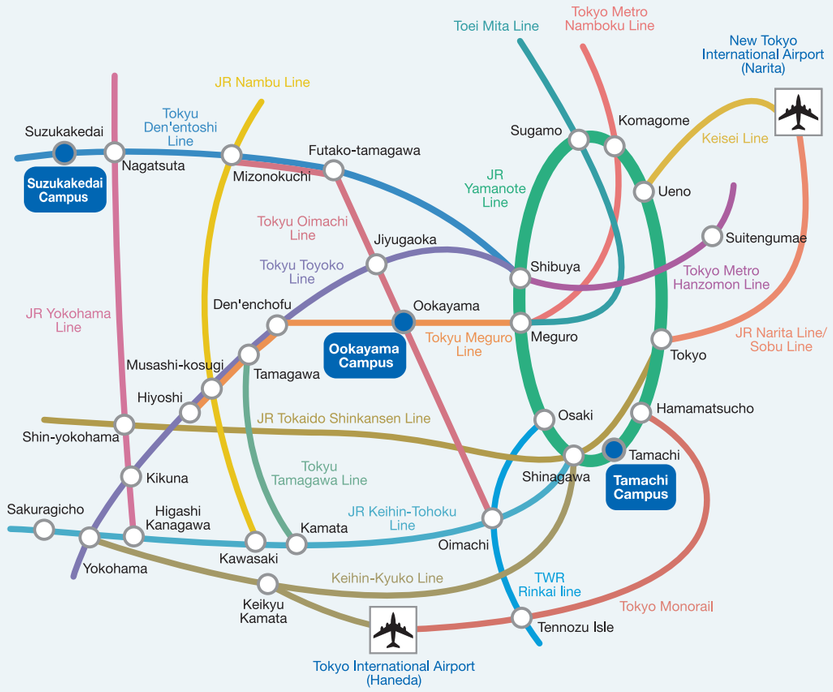
Traffic Access

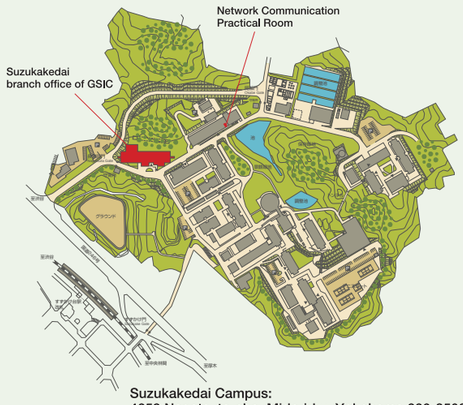


Ookayama Campus: 1-min. walk from Ookayama Station on the Tokyo Kyuko Oimachi Line or Meguro Line
Suzukakedai Campus: 5-min. walk from Suzukakedai Station on the Tokyo Kyuko Denentoshi Line
Tamachi Campus: 2-min. walk from Tamachi Station on the JR Yamanote Line or Keihin Tohoku Line

Maps

The branch of GSIC, and the Network Communication Practical Room

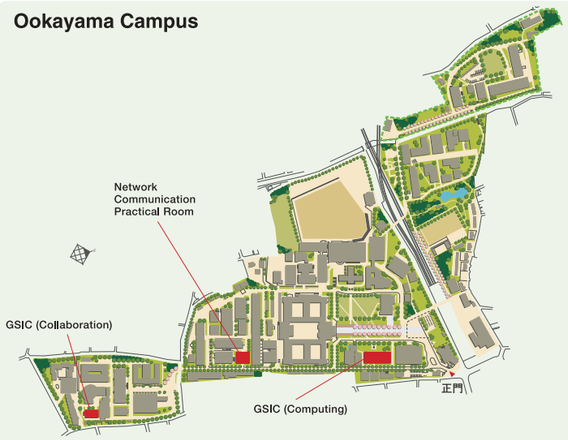
Suzukakedai Campus



Suzukakedai Campus:
4259 Nagatsuta-cho, Midori-ku, Yokohama 226-8503

The GSIC buildings and the Network Communication Practical Room

Ookayama Campus



Ookayama Campus: 2-12-1 Ookayama, Meguro-ku, Tokyo 152-8550

National University Corporation **Tokyo Institute of Technology**
Global Scientific Information and Computing Center
2-12-1 Ookayama, Meguro-ku, Tokyo 152-8550, Japan
Phone: (03)5734-2087 Fax: (03)5734-3198
E-mail: office@gsic.titech.ac.jp
URL: http://www.gsic.titech.ac.jp/

GSIC
Global Scientific Information and Computing Center

GSIC

Global Scientific Information and Computing Center 2016

Tokyo Institute of Technology

What's New at GSIC

The Global Scientific Information and Computing Center (GSIC) was established in April 2001 by amalgamating the Tokyo Institute of Technology's Computer Center and the International Cooperation Center for Science and Technology.

GSIC's missions are to apply advanced information technology to support research and education activities and to use the technology as a medium for promoting research collaboration at an international level. In line with these missions, GSIC has been showing steady results in developing the university's information infrastructure and supporting its operation, in supporting cutting-edge research in high-performance computation and further research based on its findings, as well as in using IT to promote international collaboration.

In recognition of GSIC's achievements, it was designated a Joint Usage / Research Center alongside the seven other similar centers nationwide. Starting April 2010, the GSIC commenced activities as one of the constituent centers of the Japan High Performance Computing and Networking plus Large-Scale Data Analyzing and Information Systems.

In July 2010, GSIC was restructured into an organization with two divisions to help it play an even more effective role in promoting cutting-edge research and international research collaboration as a Joint Usage / Research Center.

GSIC hopes to continue living up to expectations from both within and outside the university in the coming years through its efforts related to the university's information infrastructure and advanced research activities.

History of GSIC

1971 Foundation of TITech computer Center

HITAC 8700 computer system installed

1976 Reorganization of TITech Computer Center

HITAC M-180 computer system installed

- 1977 Introductory computer education started (HITAC M-180)
- 1988 CDC ETA 10 supercomputer installed
- 1994 Campus information networking system (Titanet) started (Titanet network operation center (NOC) established)
- 1995 CRAY C916/12256 supercomputer installed
- 1997 Titanet NOC merged into the computer center
- 1998 Education for computer and communication started (SGI Origin2000)
- 2000 NEC SX-5, SGI Origin2000 supercomputers installed
- 2001 SuperTitanet installed
  COMPAQ GS320 research computer system installed

1979 Foundation of the International Cooperation Center for Science and Technology

Inauguration of the Academic Exchange Program with South-East Asian Countries under the Core University System, with the University of Indonesia (UI)

- 1980 Inauguration of the Academic Exchange Program with South East Asian countries under the Core University System with the Indonesian Institute of Science (LIPI)
- 1984 Inauguration of an Academic Exchange Program with Bandung Institute of Technology
- 1986 Inauguration of an Academic Exchange Program with the University of the Philippines
  Inauguration of an Academic Exchange Program with King Mongkut's Institute of Technology
- 1991 Program terminated by JSPS to change to a Project-type system

2001 Reorganization of GSIC

- 2002 Titech Campus Grid (800 CPUs) 15 locations on campus
  Tokyo Tech Office (Thailand) established
- 2004 Intercampus gigabit links by private optical fiber
  Internet connection upgraded to 10Gb
- 2005 Campus-wide Wireless Network started
- 2006 TSUBAME Grid Cluster started
  Campus-wide Network Application System (based on PKI) installed
- 2008 SINET3 connection replaced by 10Gb
- 2009 Partnership Resource Allocations started
- 2010 Titanet3 installed
  Titanet wireless 2 installed
  Activities as a Joint Usage / Research Center for Interdisciplinary Large-scale Information Infrastructures started
  TSUBAME2.0 started
  Connected to SINET4
- 2012 SINET4 connection replaced by 20GB
  SINET4(Yokohama) direct connection to Suzukakedai Campus
- 2013 TSUBAME 2.5 started
- 2014 T2 CERT(TokyoTech CERT) established
- 2016 SINET5 connection replaced by 100GB

GSIC Organization

Director, Prof. YAMADA Isao

Deputy Director, (ICT Support)
Prof. NISHIBATA Shinya

ICT Support Division
[Authentication and Networking Group / Information Infrastructure Application Group]

- Prof. ISSHIKI Tsuyoshi
- Prof. NISHIZAKI Shinya
- Prof. TOMOISHI Masahiko
- Assoc.Prof. IIDA Katsuyoshi
- Assoc.Prof. MATSUURA Satoshi
- Assistant Prof. JITSUMOTO Hideyuki
- Assistant Prof. KIN Yu

Deputy Director, (Advanced Research)
Prof. AOKI Takayuki

Advanced Computing Research Division
[High Performance Computing Systems Group / Advanced Applications of High-Performance Computing Group / Large Scale Data Processing Group / Global Collaboration and Research Group]

- Prof. AOKI Takayuki
- Prof. MATSUOKA Satoshi
- Prof. YAMAGUCHI Shinobu
- Assoc.Prof. YOKOTA Rio
- Assoc.Prof. ENDO Toshio
- Assoc.Prof. WATANABE Toshio
- Assoc.Prof. NUKADA Akira
- Assoc.Prof. SASAKI Atsushi
- Lecturer. SATO Yukinori
- Assistant.Prof. SATO Hitoshi
- Assistant.Prof. SHIMOKAWABE Takashi
- Assistant.Prof. MIURA Shinichi
- Assistant Prof. Wong Un Hong

Steering Committee

- Authentication and Authorization Infrastructures Committee
- Network Infrastructures Committee
- Computing Infrastructures Committee
- Global Collaboration Committee for Utilization of Information Resources
- Partnership Resource Allocations Committee
- Public Relations Committee

Administrative Official Division
(Information Infrastracture Division, Research Promotion Department)

Number of Staffs (April 1, 2016)

	Prof.	Assoc. Prof.	Lecturer	Assistant Prof.	Admin. Official	Total
Director	(1)					(1)
Deputy Director	(2)					(2)
ICT Support Division	3	2		1 〈1〉		6 〈1〉
Advanced Computing Research Division	3	2 〈3〉	〈1〉	1 〈3〉		6 〈7〉
Administrative Official Division					18 《14》 [8]	18 《14》 [8]
	6 (3)	4 〈3〉	〈1〉	2 〈4〉	18 《14》 [8]	30 (3) 〈8〉 《14》 [8]

( ): joint appointment posts at Tokyo Tech, 〈 〉: Professor (per Contractual Limited Term Assignment), 《 》: technical staff, [ ]: part-time

JHPCN – Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures

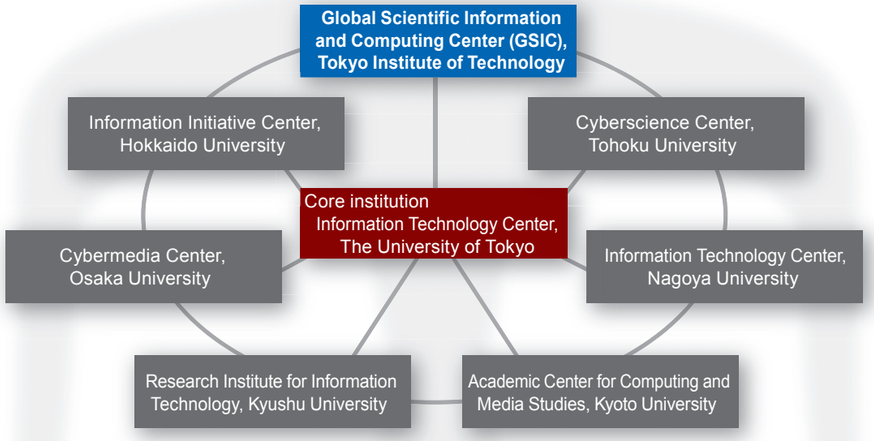
JHPCN is a network-type joint usage/research center and is made up of eight supercomputer centers in Japan. JHPCN is a six-year program of MEXT, and first and second stages began in FY2010 and FY2016, respectively.

The formal title of this program is "Joint Usage/ Research Center for Interdisciplinary Large-scale Information Infrastructures", but it is also known as "Japan High Performance Computing and Networking plus Large-scale Data Analyzing and Information Systems (JHPCN)".

The objective of JHPCN is to promote the continuous progress of academic research and to lay the groundwork for interdisciplinary collaborative research in Japan. JHPCN strives to tackle the highly challenging problems, which previously thought extremely difficult to solve, by using the combination of the eight centers' supercomputer resources and the collaboration among their researchers. In the second stage of JHPCN, we also encourage the international collaboration research, the industrial research, and the challenging exploratory research.

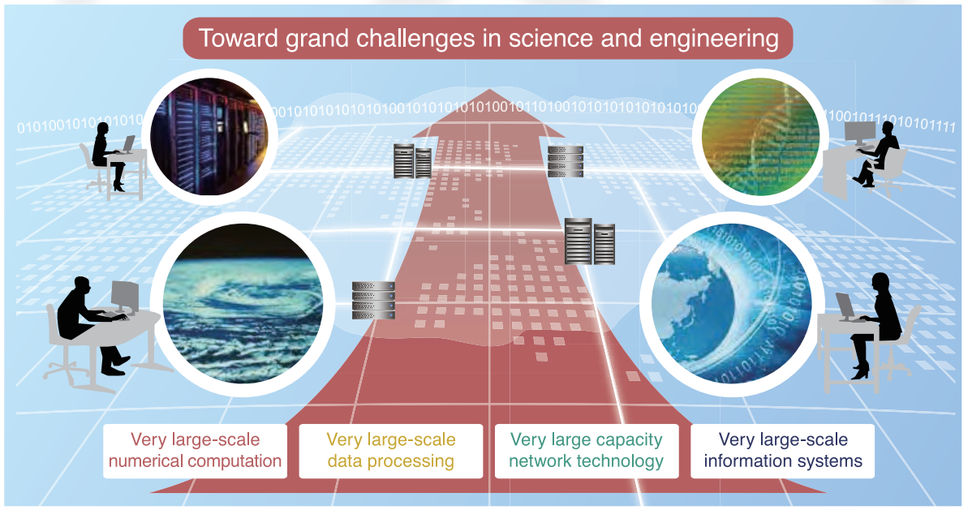
GSIC promotes research collaborations on four research topics: GPU computing and large-scale HPC applications, design and management of new-generation supercomputer, large-scale data accumulation and management technology, and utilization of advanced software management infrastructure.

8 centers comprising JHPCN



Objectives of the JHPCN

Research collaboration with pioneering researchers in the eight centers is expected to resolve the grand challenges of complex research.

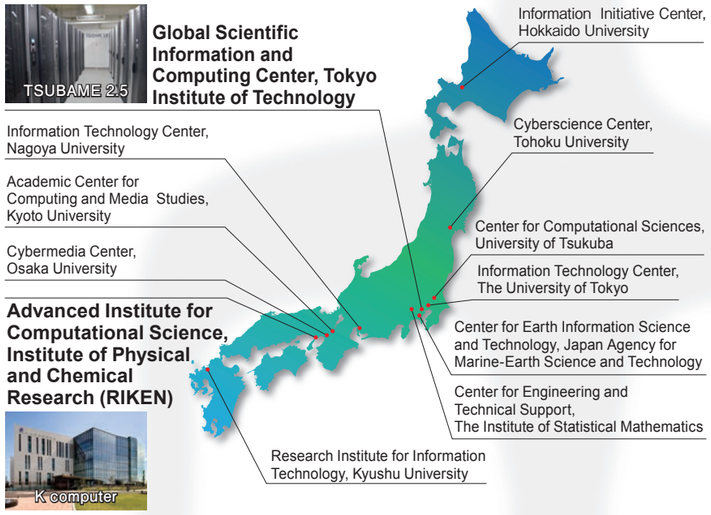


HPCI, High-Performance Computing Infrastructure

HPCI links the "K computer" and the supercomputers located in universities and research institutions nationwide via high speed networks; it is a core system contributing to the realization of a revolutionary high-performance computing environment to meet the needs of a wide variety of users. The use of HPCI is expected to allow the wide array of HPC users throughout the country to use it more efficiently and that this will accelerate the wider use of HPC from germinating research to large-scale research projects. GSIC provides a computer resource of TSUBAME for both academic and industrial users.

HPCI system providers

Global Scientific Information and Computing Center, Tokyo Institute of Technology

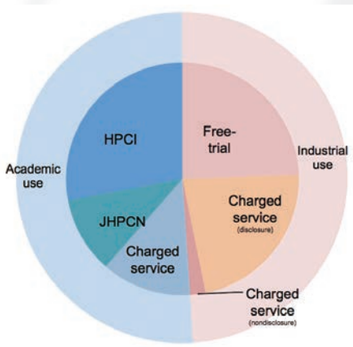


Other system providers making up the HPCI consortium

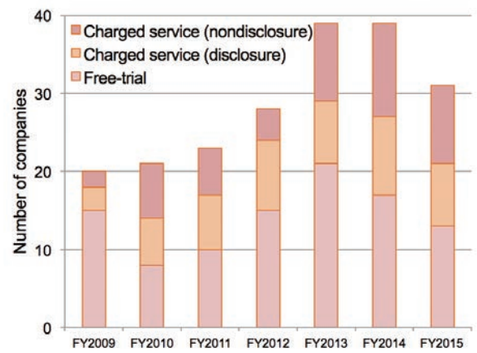
- Institute for Material Research, Tohoku University
- The Institute for Solid State Physics, The University of Tokyo
- Yukawa Institute for Theoretical Physics, Kyoto University
- Research Center for Nuclear Physics, Osaka University
- High Energy Accelerator Research Organization
- National Astronomical Observatory of Japan
- Institute for Molecular Science
- Japan Aerospace Exploration Agency
- National Institute of Advanced Industrial Science and Technology
- Japan Atomic Energy Agency
- National Institute for Materials Science
- Information Technology Center, Institute of Physical and Chemical Research (RIKEN)
- National Institute of Informatics
- Research Organization for information Science & Technology

TSUBAME Industrial-Use

Industrial researchers are able to use TSUBAME as well as researchers in other universities or government research institutes. The trial program for industrial users is free of charge and supported by the MEXT. We also have charged services to use TSUBAME resources for both academic and industrial users.



Breakdown of the TSUBAME resources allocated to extramural users in FY 2015



Number of companies using TSUBAME

The TSUBAME Supercomputer

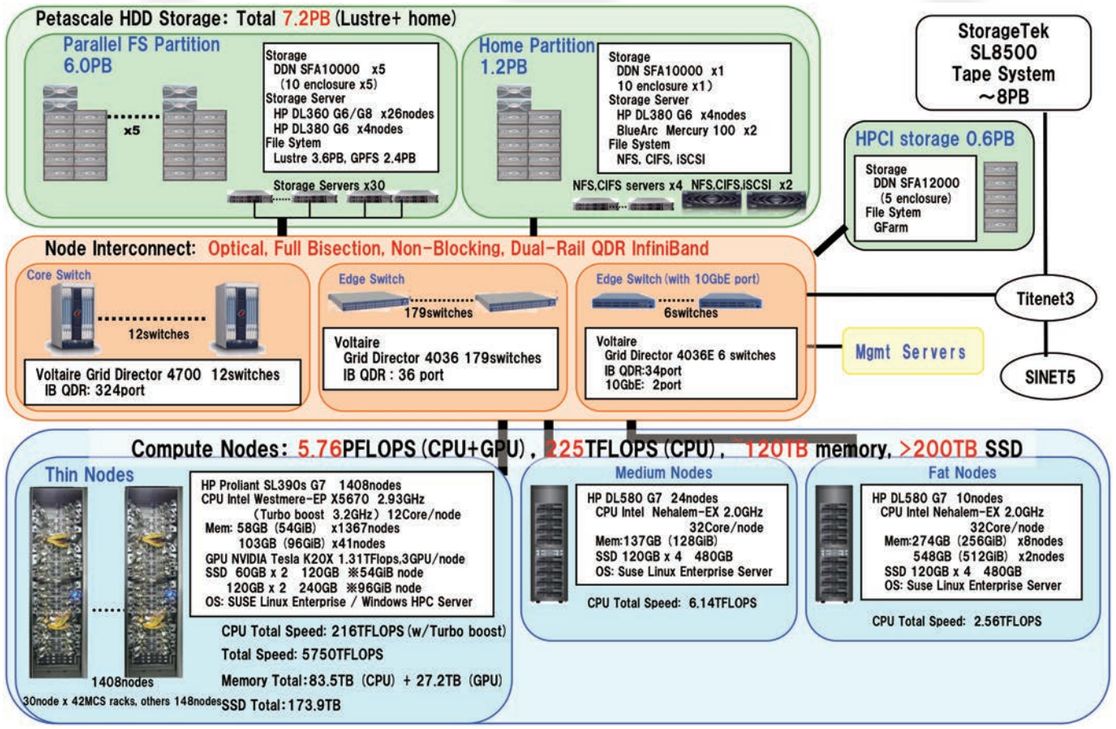
The supercomputer “TSUBAME”, which means a “swallow” in Japanese and also is a symbol of our university, is used daily by students, faculties, and researchers both inside and outside the university, and industrial users. TSUBAME provides not only world-leading computational and storage capabilities, but also provides resources for driving main campus IT cloud-based services such as large-scale storage and virtual machine hosting. Also TSUBAME plays an important role in “High Performance Computing Infrastructure”, which consists of major national supercomputer centers in Japan.

As of 2016, GSIC is operating the TSUBAME2.5 supercomputer since September 2013, which is a resultant system of version-up of GPU accelerators in TSUBAME2.0, originally installed in November 2010. TSUBAME2.5. which has computation performance of 5.76PFlops, is the second fastest supercomputer in Japan. The main part of this system consists of >1,400 computing nodes, which provide computing power to users from various research areas. Each (thin) node embodies 12 Intel Xeon CPU cores and three NVIDIA Tesla K20X GPUs. TSUBAME also provides a petascale storage, used not only for storing large scale result data of compute jobs, but for cloud storage service.

TSUBAME2.5, which provides above-mentioned petascale computing/storage resource, is a highly compact and low-power system. It exhibits world’s most efficient power performance ratio (that is like fuel efficiency in automobiles). Also this system contributes to power saving of our campus largely, by the automatic “peak-shift” operation in summer.

Through such efforts with TSUBAME, such as industry research cooperation, international cooperation, education for future computational scientists, and saving energy consumption, supports for big-data analyses, GSIC is planning to introduce the next-gen “TSUBAME3.0 (Cloud Big-data Green Supercomputer)” in 2017.

System Overview of The TSUBAME 2.5 Supercomputer



Campus Network Titanet3

The campus network of Tokyo Tech has reached to Titanet3 after the second upgrade in 2010. Titanet3 is a simple two-tier architecture that consists of 10Gbps core switches with high port density and an edge switch located in each building, which are directly connected by single-mode optical fibers. The upgrade not only provides high-speed and wide-bandwidth network but also solves the issues in the conventional 3-tier architecture that the breakdown or power failure of the aggregation switches can affect the network widely, which improves the stability and operability.

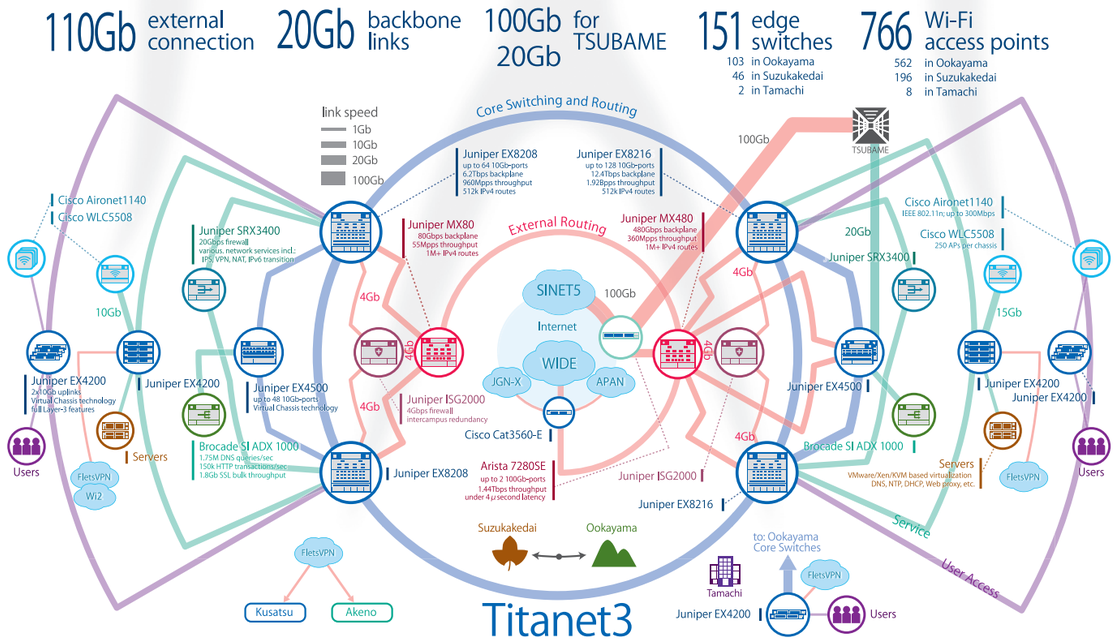
The core switches are setup in redundant manner at both of the Ookayama and Suzukakedai campuses and the bandwidths of the connections between core switches or campuses are guaranteed by over 20Gbps. Specifically, the connection between core and edge switches consists of two 10Gbps links redundantly and each edge switch provides 1Gbps bandwidth per staff in each building. In the Tamachi campus, we also introduced a single-mode two-channel WDM facility and constructed the same network environment as that in other campuses. For the faraway research institutions such as the Kusatsu Volcanic Fluid Research Center, we introduced FLET’S service to provide access to the Titanet3.

Furthermore, in addition to legacy services such as IPv6 and multicast, several new features such as sampling-based traffic analysis and virtual chassis technology have been introduced in order to realize high functionality and reliability.

For the connections to the Internet and outside research institutes, Titanet3 is directly connected to academic research network and projects such as SINET, APAN, WIDE and JGN, etc., and it is also designed to select the optimal route for communications. In 2016, with the upgrade of SINET, the network environment of the most frontier research projects has also been upgraded. Specifically, the connection from TSUBAME to SINET will be provided with100Gbps bandwidth and 110Gbps in total of the campus network.

In modern society, information communication is essential for human’s life activities. Titanet3, as one of the most important infrastructures of Tokyo Institute of Technology, not only supports the most frontier researches, educations and operational activities but also provides indispensable service for daily campus life. Additionally, many systems have been designed and in service to support university operation which include such as campus authentication and authorization system, campus wireless networks, remote lecture system, video conference systems, internal telephone system between campuses, power and water meter-reading system and Disaster Information broadcasting system, etc. All the above systems require campus network service as prerequisite therefore Titanet3 plays a major role in construction of campus life infrastructure as “infrastructure for infrastructures”.

Network Topology of Titanet3



Titanet is built, served, and operated by Titanet NOC. See http://www.noc.titech.ac.jp/ for more information.

201604

Campus Wireless Network - Titanet Wireless 2

The campus wireless network of Tokyo Institute of Technology started operation in 2005, primarily in lecture halls and popular spaces where are regularly used by students in order to enhance the network service to whom any laboratory has not been associated yet.

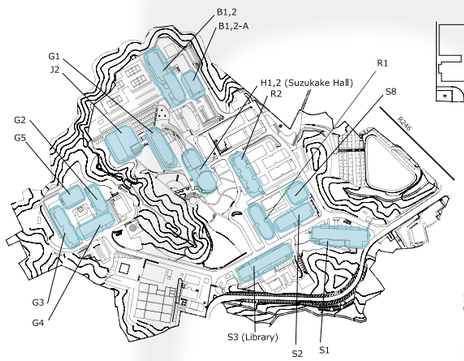
When we firstly upgrade the wireless network in 2010, it reached to Titanet wireless 2 (TW2) which could accommodate a wide variety of terminal devices with high capacity and reliability and was compatible with high-speed communication standards.

With TW2, in addition to upgrading the hardware devices, we updated the service policies such as allowing simple authentication, constructed redundant controllers and also introduced the licenses for controllers that are capable of increasing access points successively. Next, in addition to conventional wireless network service for internal users, we also added tentative campus wireless network service for conference event and access to commercial wireless network service provider for personal guests of the staffs. In case of the major catastrophe, we also planned to provide free network service for the victims based on the function of tentative network service as well as provider policies.

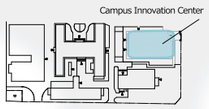
So far as of March 2016, including increased access points in new spaces and those individually setup in branches, the total number of access points in the campus has reached to 766. Compared to other institutions, this is an extremely large-scale wireless network infrastructure, and the number of both internal and external users continues to increase.

TW2 Communication Areas

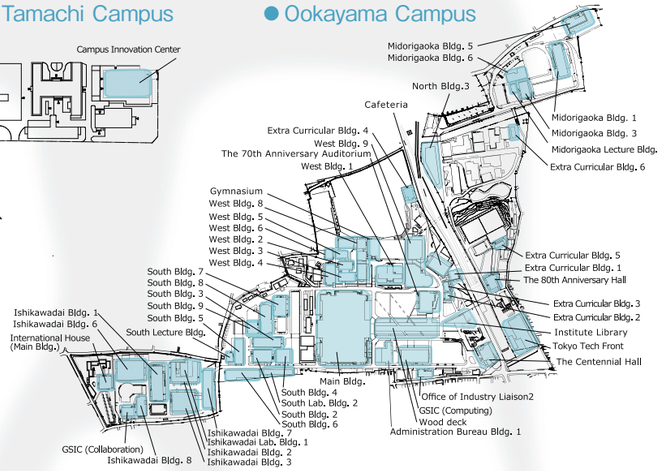
● Suzukakedai Campus



● Tamachi Campus



● Ookayama Campus



Web Hosting and DNS Hosting Services

In order to reduce administrative cost of Web/DNS (Domain Name System) servers in labs, schools and offices, we provide web and DNS hosting services. By using the services, each organization is able to publish information related to researches, education and campus life without managing hardware facilities, OS (Operation System) and software.

The web hosting service is provided by virtual machines running on TSUBAME high performance computer system with allocating virtual domain name for each organization and this is a good example that TSUBAME is also a server infrastructure used in all over Tokyo Tech.

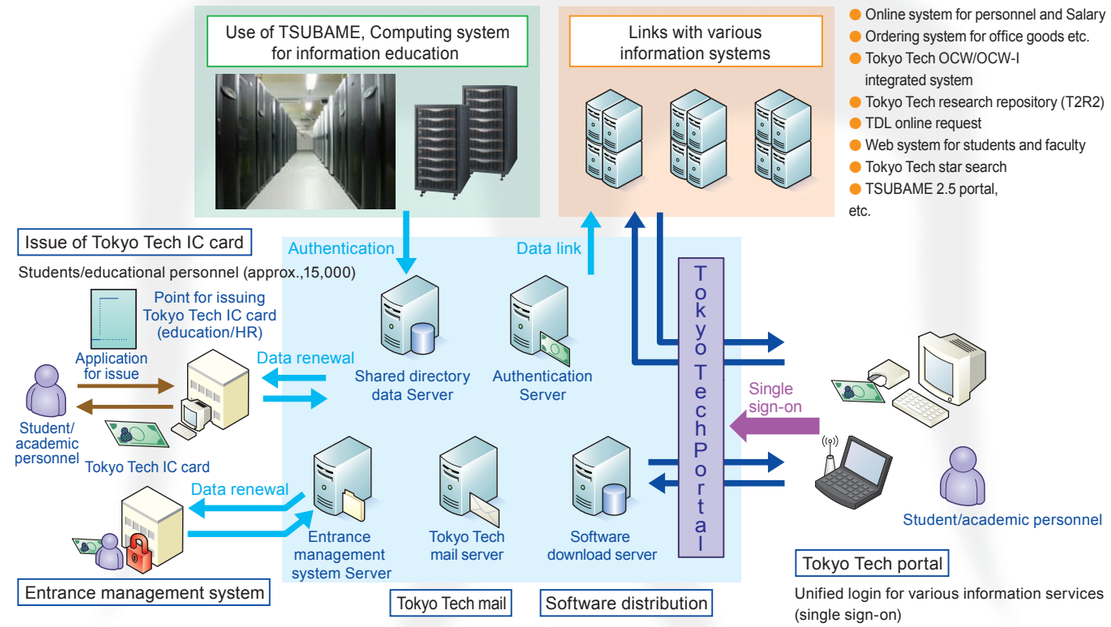
Services for Security and Safety

In 2016, we introduced a new Next Generation Firewall (NGFW) system into the campus network to prevent advanced cyber security attacks and take prompt response in case of being attacked. In collaboration with the NGFW, our Peer-to-Peer file-sharing (P2P) software detection system to avoid copyright infringement incidents and Web Application Firewall (WAF) will continuously provide services in the campus network. Finally, in cooperation with CERT team that was set up in 2014, we purpose to realize secure campus network environment.

Campus-wide Authentication and Authorization System

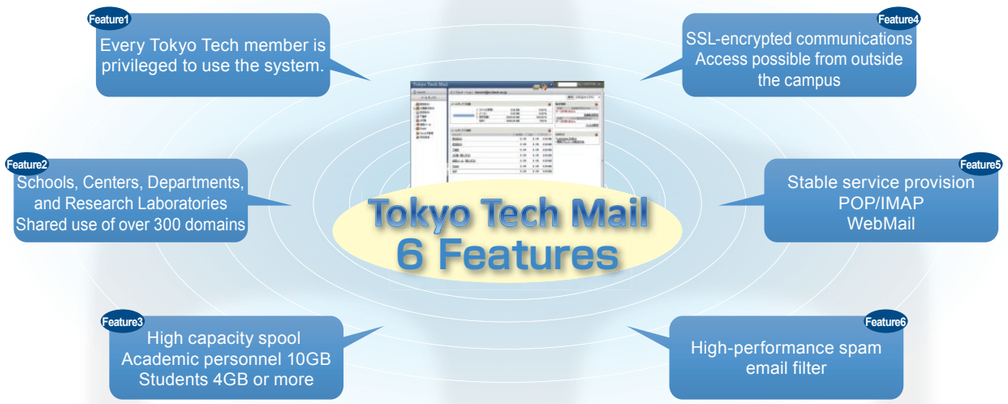
The campus-wide authentication and authorization system is information service infrastructure established in 2005. Upon registering for the university, students are issued with an identification card (Tokyo Institute of Technology IC card) that includes user access permissions for this system. This means that Tokyo Tech members can use each information service within the campus by one ID and password, which increases convenience for the users, reduces management costs and makes it possible to maintain security. For the method of access, as advanced security is required, PKI authentication is performed using the IC card functionality, and if there is no IC card reader, matrix-code authentication using the table of random numbers printed on the backside of the ID card. This provides access to systems such as Tokyo Tech email servers, web system for students and faculty, Tokyo Tech OCW/OCW-i integrated system, university network access via SSL-VPN, ordering systems for office goods, etc., Tokyo Tech Research Repository (T2R2), library services, and the provision of software licenses based on campus agreements. The Tokyo Tech IC card is also used to provide entrance to the buildings, contributing to physical security management in the campus.

Outline of the Campus-wide Authentication and Authorization System



Tokyo Tech Mail

The "Tokyo Tech Mail" system began operations in 2006 in order to provide a campus-wide email environment to students and academic personnel, and through activities such as academics, education, research and organizational management, we have provided a reliable email service, enabling the smooth exchange of information using email. In 2012, the system was replaced with the aim of further improving convenience, operability, and stability. This included the addition of a spool to handle the excess of the size of email data, a high performance spam filter to prevent spam email and as user communications related to sending and receiving were all SSL encrypted, it became possible to access the server from outside of the campus as well. There are also plans to link to a lifelong email system for Tokyo Tech alumni.



Campus Software Agreement

Service outline

Campus-wide license agreements have been formed for software that is widely used throughout the Institute, such as Microsoft Windows, Microsoft Office, anti-virus software, Adobe Creative Cloud and MATLAB. In addition to contributing greatly to a reduction in software purchase costs in areas such as the laboratories (reduction of expenses overall in the Institute), this has been useful in preventing illegal copying.

Furthermore, it is also possible for students and academic personnel to purchase Microsoft Windows and Microsoft Office for their individual PCs at a discounted rate, making a contribution to the study and research environment. Through the provision of software, authentication can take place with the campus-wide authentication and authorization system, enabling an optimized form of management.

IT Service Desk

Service outline

The IT service desk provides the functions of receiving and performing a preliminary analysis on telephone and email inquiries regarding the content of all the services provided by the Global Scientific Information and Computing Center. Furthermore, as it passes on inquiries about services other than information services provided by the Center to the relevant department, it provides a one-stop shop function.

Example of inquiry content

- Email system
- Tokyo Tech portal
- Connectivity to the campus network
- Software licenses of campus agreement
- Use of the TSUBAME 2.0 education system,

etc

Computing Systems for Education Use

Objective

Information education computer systems, as shown below, are used in computer literacy and computer science classes for 1st year students and in classes such as computer skills for 2nd to 4th year and post-graduate students. In the backend, they are directly used in TSUBAME and cloud services, enabling even 1st year students a chance to experience cutting-edge research facilities.

Information Literacy I and II

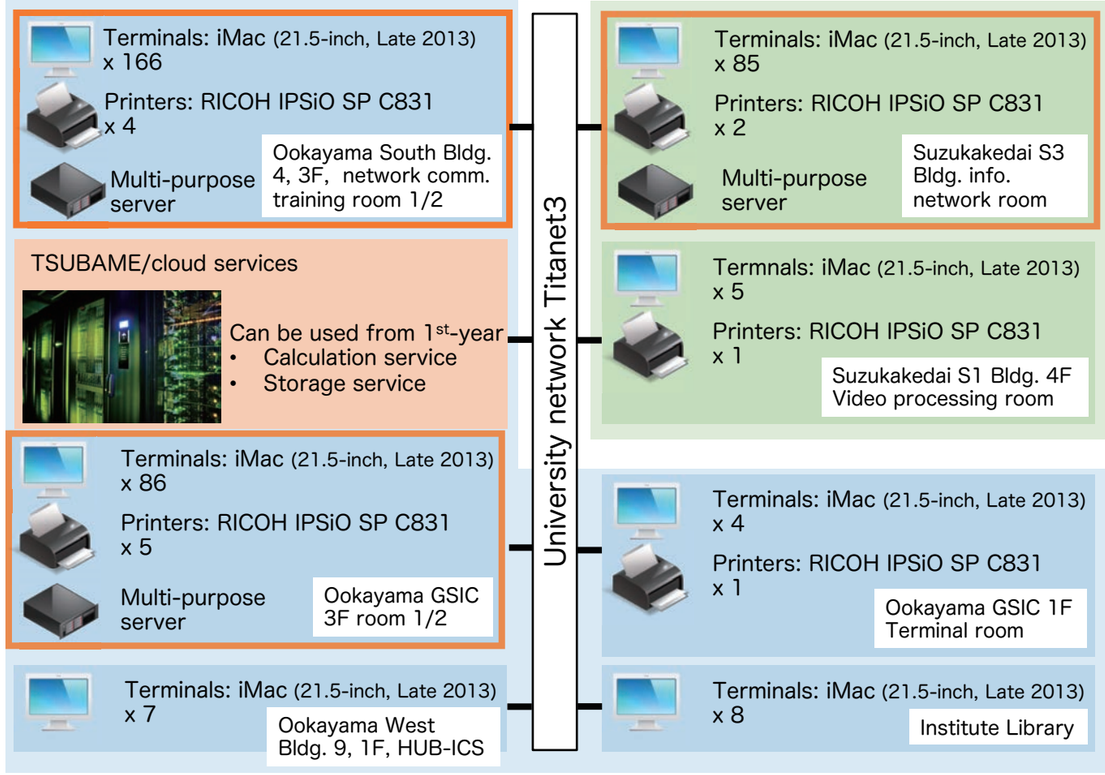
The focus of this study is not simply how to use the information devices, but also covers the learning of legal and ethical content and etiquette, to prevent using information in the wrong way.

Computer Science I and II

Here you learn various basic knowledge and principles in regard to the concept of “calculation,” which is the foundation of computers.

Computer skills

For those who have completed the "Information Literacy I and II" and "Computer Science I and II" courses,this course is based on programming skill and offers the opportunity to learn how to design the interface for experiment equipment and measurement devices, and the methods of numerical calculation related to these fields.



Promotion of International Collaboration

The Global Scientific and Computing Center aims to create value through a wide variety of international linkups using information technology.

With the keywords of “Integration,” “Diversification,” and “Focused Contribution,” we are conducting joint research and planning and executing collaborative projects with international research institutes and higher educational institutes.

We also hold various international symposiums and workshops reflecting the result of collaborative research and projects.

Promotion of International Collaboration
In concrete terms,

- We aim to initiate collaborative projects using information technology and plan to conduct research projects focusing on local applications.
- We aim to strengthen linkages with local governments and industries as well as educational and research institutions, through the use of overseas offices of Tokyo Tech.
- We aim to introduce technical innovations for sustainable development through international collaborations using large-scale computations in relation to the issues facing international society, such as the global environment problem, natural disaster security measures, and underground resource development.

Themes on the International Collaboration Field

International collaboration themes include “Hybrid parallelization of turbulent Lattice Boltzmann simulations with MPI on GPUs,” “Parallel Solution of Random Ordinary Differential Equations with GPUs and GPU-Clusters,” “Structure based approach for understanding organism specific recognition of protein-RNA complexes,” “Molecular dynamics and free energy analysis of protein–ligand interactions,” “HiCMA — Hierarchical Computations on Manycore Architectures,” “Fast Multipole Methods for Molecular Dynamics,” “Integration of sustainable ICT for teacher training in Mongolia,” and “Application of appropriate information technology for World Heritage Site preservation”.

● **List of MOU (as of fall 2016)**

India	Indian Institute of Technology, Madras school	2011/11 (5 years)
Australia	Department of Civil Engineering, Curtin University	2012/8 (5 years)
Thailand	Faculty of Engineering, Chulalongkorn University	2013/2 (5 years)
Germany	Institut für Informatik, Technische Universität München	2013/11 (5 years)
Lao PDR	Departmente du Patrimoine LuangPrabang	2013/8 (3 years)
Mongolia	Mongolian State University of Education	2014/9 (5 years)
USA	PICSciE	2016/3 (5 years)

International Joint Research using TSUBAME

Through international joint research using the supercomputer TSUBAME, which exhibits the world’s highest level of performance, we aim to create mutual benefit for both Tokyo Tech researchers and their collaborators in the areas where a significant international contribution can be expected.

The Global Scientific Information and Computing Center are actively supporting this kind of joint research and encourages international researchers involved in joint research to use TSUBAME.

In line with the security export control regulation, the services are provided with an attention given to prevent any breach of the law related to the unintended leakage of technology, in order to allow overseas researchers who are non-Japanese residents to take advantage of TSUBAME.

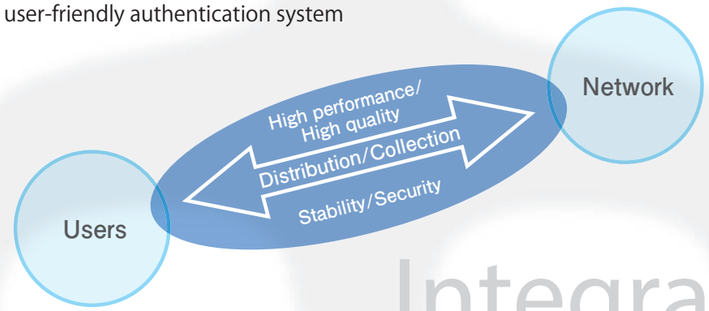
ICT Support Division

Authentication and Networking Group

Ideal Information Access and Distribution

Our group mission is to construct an ideal information and communications technology (ICT) infrastructure, which is integral to our research activities.

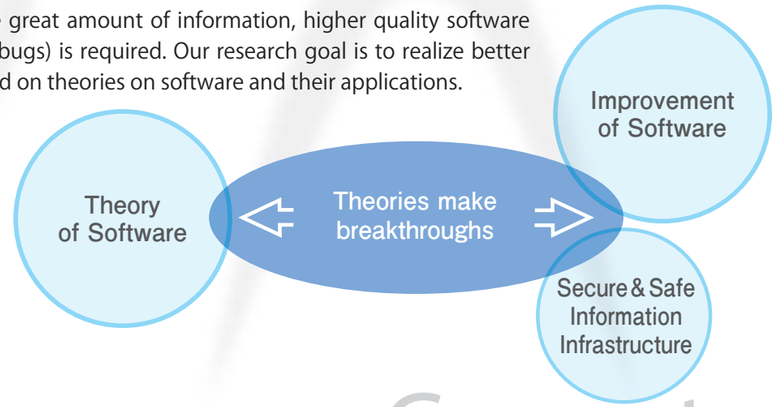
- Reliable network security infrastructure
- High performance and high quality networking
- Stable, secure and user-friendly authentication system



Information Infrastructure Application Group

Better software development

To utilize the great amount of information, higher quality software (i.e. with less bugs) is required. Our research goal is to realize better software based on theories on software and their applications.



Advanced Computing Research Division

High Performance Computing Systems Group

TSUBAME: Everybody's supercomputer as Premiere Presence in Japanese HPCI

The mission of the High Performance Computing (HPC) Systems Group are to research, develop, construct and manage large-scale HPC systems, mainly the TSUBAME supercomputer, No.3 system in Japan*, and further to collaborate with outside institutions to play a premiere leadership role in the Japenese High Performance Computing Infrastructure (HPCI). * as of Nov 2015

The TSUBAME Supercomputer

- World-leading performance of 5.7 Peta Flops
- Achievement of high performance and general purpose usage by hybrid architecture with GPGPU technology
- Large scale, multi-tiered and easy-to-use storage that consists of 7 Petabyte shared HDD storage and 4 Petabye tape storage

R&D towards Next-Gen Supercomputing

- TSUBAME-KFC (/DL): an ultra low power supercomputer prototype with liquid submersion cooling
  → World No.1 in Green500 and GreenGraph500 (Nov 2013)
- R&D of next-gen big data processing, graph processing, technology for deeper memory hierarchy and many-core processors

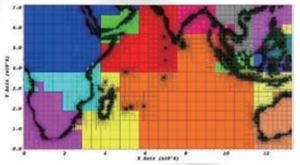
TSUBAME

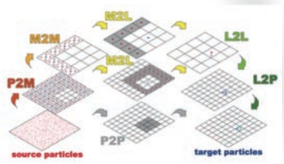
Premiere Supercomputer in Japanese HPCI

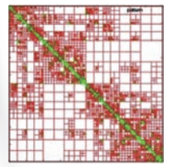
Advanced Applications of High-Performance Computing Group

Scientific and Public Contributions using High-Performance Computing

We are conducting R&Ds related to advanced applications of high-performance computing on TSUBAME supercomputer and aiming at scientific outcomes and public contributions.







- New algorithms for GPU computing
- Large-scale HPC applications using GPU
- International research collaboration on HPC applications
- Dynamic Load Balance
- High productivity framework for HPC applications
- Hierarchical methods for Exascale
- Compute-bounds kernels for future architectures
- International collaboration for open source libraries

Applications on TSUBAME

- Large-scale Simulation for two-phase flows
- Large-Eddy Simulation on turbulent flows
- Study on Fluid-structure interaction
- Tsunami simulation
- Particle simulation for granular and fluid
- Molecular simulation using FMM
- Sparse matrix preconditioners
- Electromagnetic simulation using H-matrix

APPLICATION

Scientific and public contributions using TSUBAME

Advanced Computing Research Division

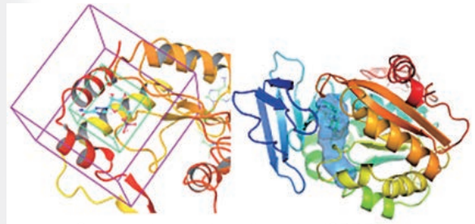
Large Scale Data Processing Group

Advanced of Science and Technology by Large Scale Data Processing

Large Scale Data Processing Group lead the advancement and extension of drug discovery and life science through large scale data processing.

Themes of Large Scale

- Data Processing of Large Scale Drug Discovery Simulation Data
- Theoretical Chemical Compound Design
- Binding Free Energy Analysis of Protein-Ligand interaction
- Pharmacophore Modeling through Large Scale FMO calculation
- GPGPU calculation for Large Scale Data Processing
- Application Development for Large Scale Data Processing



Structure-based drug discovery (SBDD)

DATA PROCESSING

Advancement of Science and Technology using TSUBAME

Global Collaboration and Research Group

ICT Application for International Collaboration

The research group plans and implements collaborative research projects using ICT together with international research and higher educational institutions covering various dimensions. We aim to maximize Tokyo Tech's potential in research and education in global area.

Themes of Global Collaboration and Rearch Group

- Strengthening the collaboration with major govemmental agencies and research institutes in Asia and planning and implementing projects
- Planning and implementing a locally-applied project in collaboration with international agencies and multi-national organizations
- International research collaboration on predicting and simulating natural disasters
- Application of ICT in regional development and conservation of world cultural heritage sites
- Introduction of sustainable ICT in developing countries
- International research collaboration on numerical fluid dynamics using TSUBAME's GPU
- Development of novel drugs for Neglected Tropical Diseases

Heritage Database Department

Introduction of GIS

Mobile Learning

INTERNATIONAL COLLABORATION

with Application of ICT