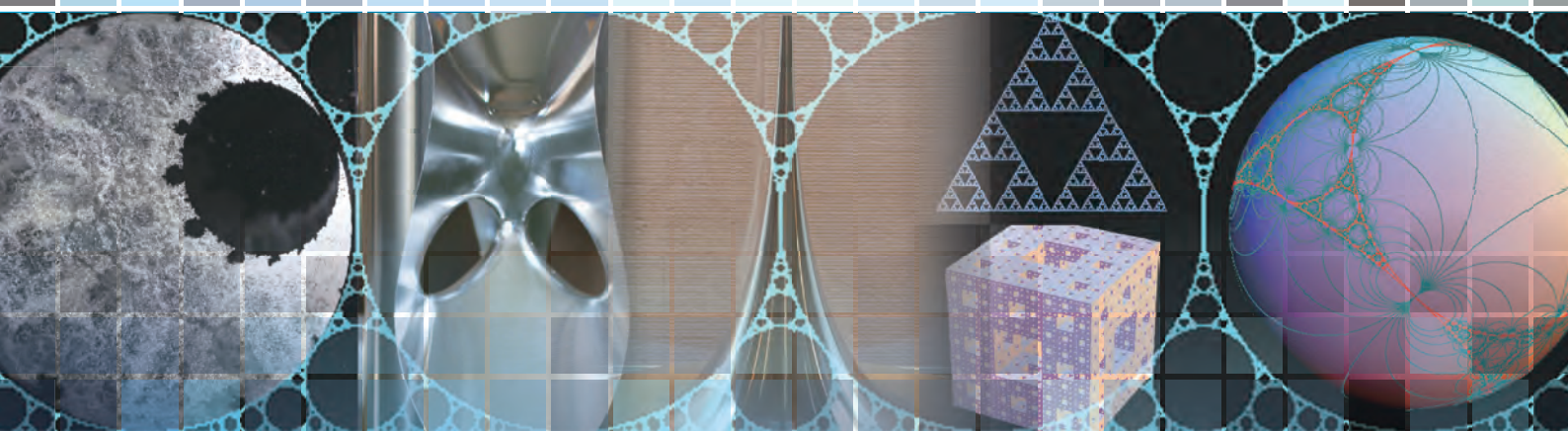




Graduate School of
MATHEMATICAL SCIENCES
THE UNIVERSITY OF TOKYO





Contents

A Message from the Dean	1
Brief History	2
Faculty	3
Graduate School and students from abroad	7
French-Japanese Laboratory of Mathematics and its Interactions	8
Interdisciplinary Center for Mathematical Sciences	9
World-leading Innovative Graduate Study for Frontiers of Mathematical Sciences and Physics	10
Lectures and Seminars	12
Facilities	13
Seminars for Researchers	14
Access	15

A Message from the Dean



Kengo HIRACHI

Dean of the Graduate School of Mathematical Sciences

The University of Tokyo

The Graduate School of Mathematical Sciences was established in 1992 to foster a culture of mathematics and mathematical sciences from an international standpoint, as well as to contribute to the overall development of society. It is a unified graduate school for mathematics and related areas, and the Graduate School of Mathematical Sciences is in full charge of mathematics education at the University of Tokyo.

We accept each year 53 graduate students for the Master program and 32 for the Ph.D. program. The courses of the Graduate School cover all fields of mathematical sciences including algebra, geometry, analysis, and applied mathematics. The courses and seminars are given in English when there are students who do not speak Japanese. Besides these courses, we invite many researchers from outside of the Graduate School of Mathematical Sciences to teach application-oriented subjects including economics, finance, and information technology. We have courses to train students in actuarial and statistical sciences, which are directly connected to real world experience. Students conduct research in an independent and fulfilling environment, supported by their thesis advisors. They study as independent scholars with free and ample access to various facilities. For example, the library of the Graduate School of Mathematical Sciences is one of the best libraries in mathematics in the world. The graduates of our school work at universities and colleges, research institutes, government ministries, finance and insurance institutions, information technology companies, and so forth. They actually contribute to the development of society in various fields. The Graduate School grew out of two independent departments of mathematics that existed within the University of Tokyo: one in the Faculty of Science on the Hongo campus and the other in the College of Arts and Sciences on the Komaba Campus. All the faculty members of these two departments joined in the new graduated school in 1992. We have our building of the Graduate School of Mathematical Sciences at the southeast edge of the Komaba Campus since 1995.

Presently, the number of tenured professors and associate professors at the Graduate School of Mathematical Sciences is about 56. Besides tenured professors and associate professors, we have visiting professors and overseas visiting professors. Members of the Graduate School conduct leading-edge research in all fields of mathematical sciences, from algebra, geometry, and analysis to applied mathematics. The long tradition of advanced scholarly research since before the merger of the two departments of mathematics helps the Graduate School of Mathematical Sciences function as an international research center. We host over 150 researchers from around the world each year and there are many overseas exchange students. Thus, the Graduate School of Mathematical Sciences plays a role of an international hub in mathematics. Based on this track record, French-Japanese Laboratory of Mathematics and its Interactions (FJ-LMI) was established in 2023 by the French National Center for Scientific Research (CNRS) and the Graduate School of Mathematical Sciences. Researchers and students from France will stay at our school for a long/medium term to conduct research exchanges. FJ-LMI is expected not only to produce results for researchers, but also to provide a basis for international activities by building a network of researchers through direct exchanges among the younger generation, including students.

Even in these 30 years, we experienced a new stage in the evolution of mathematics. There has been tremendous progress in areas where mathematics and other branches of sciences collude, and mathematical knowledge has become the backbone of various sciences like physics, biology, chemistry, information theory, engineering, economics, etc. These developments show the importance of collaborations with other branches of sciences as well as with the society.

We are intimately collaborating with the Kavli Institute for the Physics and Mathematics of the Universe (Kavli IPMU) which is the first institute in Todai Institutes for Advanced Study (TODIAS). It was founded in 2007 by the World Premier International Research Center Initiative (WPI) of the Japanese government. It received a very high international evaluation, and it became a member of the Kavli institutes in 2012. At present, 7 faculty members at Kavli IPMU have joint appointments with the Graduate School of Mathematical Sciences.

Within the University of Tokyo, the department of mathematics has a long history. It was founded in 1881 and it has always managed to keep its long tradition of sustaining a high academic level. It has maintained a rich library collection, a common room, and has succeeded in sending graduates to fulfill a wide variety of roles in society. In keeping with these fine traditions, the Graduate School of Mathematical Sciences aims at fulfilling its social duty by offering excellent education and by producing outstanding research results. All members of the Graduate School of Mathematical Sciences will make every effort to meet these exciting challenges.

Brief History

April 1877

The University of Tokyo is established, and the Department of Mathematics, Physics and Astronomy is placed in the Faculty of Science.

September 1881

The Department of Mathematics, Physics and Astronomy is divided into three separate departments.

May 1949

The College of Arts and Sciences is added to the University of Tokyo, in which a separate Department of Mathematics is established.

March 1953

The present-day Graduate School is formed, in which the members of the Department of Mathematics in the Faculty of Science and the Department of Mathematics in the College of Arts and Sciences begin educating graduate students.

April 1962

The Department of Pure and Applied Sciences is established in the College of Arts and Sciences.

April 1992

A new Division of Mathematical Sciences of the Graduate School is formed, consisting of a single Department of Mathematical Sciences combining all the mathematics faculty in the University.

August 1995

The first phase of the construction of a new building for the Department of Mathematical Sciences is completed.

March 1998

The second phase of the construction of the new Mathematical Sciences building is completed.

April 2004

All National Universities were transformed into National University Corporations, including The University of Tokyo.

April 2013

The “Interdisciplinary Center for Mathematical Sciences” is established at the Graduate School of Mathematical Sciences.

September 2023

The French-Japanese Laboratory of Mathematics and its Interactions (FJ-LMI) is established by CNRS and the Graduate School of Mathematical Sciences.

Faculty

Professors

Name	Field of Interest	Keywords
ABE, Noriyuki	Representation theory	reductive groups, modular representations
AIDA, Shigeki	Probability Theory	stochastic analysis, Malliavin calculus, rough path
FURUTA, Mikio	Low Dimensional Topology, Global Analysis	4-dimensional manifolds, gauge theory
GONGYO, Yoshinori	Algebraic Geometry, Complex Geometry	minimal model program, canonical bundles, birational maps, adjunction formulas
HABIRO, Kazuo	Topology	3-manifolds, quantum invariants, homological algebra
HIRACHI, Kengo	Differential Geometry, Several Complex Variables	parabolic geometries, CR geometry, conformal geometry, Bergman kernel, strictly pseudoconvex domains
HONDA, Shouhei	Geometry related to Ricci curvature, and non-smooth Geometric Analysis	Ricci curvature, Laplacian, Gromov-Hausdorff convergence
ISHIGE, Kazuhiro	Partial Differential Equations	asymptotic analysis and geometric analysis for solutions to parabolic equations
IYAMA, Osamu	Algebra, Ring Theory, Representation Theory	order, quiver, derived category, dg category, cluster algebra, Cohen-Macaulay representation, non-commutative resolution
KAWAHIGASHI, Yasuyuki	Operator Algebras, Mathematical Physics	von Neumann algebras, subfactors, conformal field theory, tensor categories
KAWAZUMI, Nariya	Topology, Riemann Surfaces	moduli spaces of Riemann surfaces, mapping class groups, Goldman-Turaev Lie bialgebras
KIDA, Yoshikata	Discrete Groups, Ergodic Theory	orbit equivalence relations, measured groupoids, amenability, and rigidity
KOBAYASHI, Toshiyuki	Lie Theory, Representation Theory, Geometric Analysis	unitary representations, discontinuous groups, homogeneous spaces, visible actions on complex manifolds, minimal representations, branching laws, semisimple Lie groups, algebraic analysis
MASUDA, Hiroki	Theoretical Statistics, Probability Theory	asymptotic statistics, Lévy process, mixed-effects modelling, inference for stochastic process
MIYAMOTO, Yasuhito	Nonlinear Partial Differential Equations	nonlinear parabolic and elliptic partial differential equations, bifurcation analysis, qualitative studies of solutions
OGUIO, Keiji	Algebraic Geometry	Calabi-Yau manifolds in wider sense
SAITO, Norikazu	Numerical Analysis, Applied Analysis	finite element method, finite difference method, nonlinear partial differential equations
SAITO, Takeshi	Arithmetic Geometry	étale cohomology, ramification, local fields
SAKAI, Hiroshi	Mathematical Logic, Set Theory	large cardinals, forcing axioms, continuum hypothesis, infinite combinatorics
SASADA, Makiko	Probability Theory	hydrodynamic limit, interacting particle systems
SHIHO, Atsushi	Arithmetic Geometry	crystals, p-adic cohomology, rigid geometry
TAKAGI, Shunsuke	Algebraic Geometry, Commutative Algebra	Frobenius splitting, F-singularities, singularities of the minimal model program, local cohomology
TAKAYAMA, Shigeharu	Complex Geometry	adjoint bundles, singular Hermitian metric, multiplier ideal sheaves
TSUJI, Takeshi	Number Theory, Arithmetic Geometry	p-adic Hodge theory, p-adic representations, log algebraic geometry

Faculty

Name	Field of Interest	Keywords
WILLOX, Ralph	Mathematical Physics, Integrable Systems	integrable discrete systems, integrability detectors, soliton cellular automata, discretization techniques
YOSHIDA, Nakahiro	Theoretical Statistics, Probability Theory	limit theorems for semimartingales, asymptotic expansion, Malliavin calculus, statistics for stochastic differential equations, asymptotic decision theory, higher-order asymptotic theory, nonsynchronous estimation, statistical computing

Associate Professors

Name	Field of Interest	Keywords
ASUKE, Taro	Differential Topology	foliations, geometric structures, characteristic classes
HASEGAWA, Ryu	Theoretical Computer Science	lambda calculus, type theory, category theory, proof theory
HAYASHI, Shuhei	Dynamical Systems	hyperbolicity, homoclinic bifurcations, ergodic theory
IMAI, Naoki	Arithmetic Geometry	Galois representations, moduli spaces
ITO, Kenichi	Partial Differential Equations	Schrödinger equations, scattering theory, spectral theory
IWAKI, Kohei	Ordinary Differential Equations Special Functions, Mathematical Physics	exact WKB analysis, Painleve equations, topological recursion
KASHIWABARA, Takahito	Partial Differential Equations, Numerical Analysis	Navier-Stokes equations, finite element method, non-standard boundary conditions
KATO, Akishi	Mathematical Physics	conformal field theory, string theory, integrable systems
KELLY, Shane	Algebraic Geometry	motivic homotopy theory, algebraic K-theory, representation theory, class field theory, birational geometry.
KITAYAMA, Takahiro	Topology	3-dimensional manifolds, character varieties, torsion invariants
KOIKE, Yuta	Mathematical Statistics, Probability Theory	asymptotic statistics, financial econometrics, high-dimensional statistics, high frequency data, statistics for stochastic processes
KONNO, Hokuto	Geometry and Topology	4-dimensional manifolds, gauge theory, diffeomorphism groups
MATSUI, Chihiro	Mathematical Physics, Statistical Mechanics	quantum solvable models, solvable stochastic processes
MATSUO, Atsushi	Groups, Lie Algebras and Integrable Systems	infinite-dimensional Lie algebras, vertex operators, monstrous moonshine, conformal field theories, quantum groups
MIEDA, Yoichi	Number Theory	Shimura varieties, Langlands correspondence, rigid geometry
MITAKE, Hiroyoshi	Partial Differential Equation	viscosity solution approach to asymptotic problems in front propagation, dynamical system and related topics
OSHIMA, Yoshiki	Representation Theory	unitary representations, semisimple Lie groups, branching law, harmonic analysis, coadjoint orbits
SAKAI, Hidetaka	Special Functions, Integrable Systems, Ordinary Differential Equations	Painlevé equations, difference equations

Faculty

Name	Field of Interest	Keywords
SAKASAI, Takuya	Topology	mapping class groups, moduli spaces of Riemann surfaces, 3-dimensional manifolds
SEKIGUCHI, Hideko	Non-Commutative Harmonic Analysis	semisimple Lie groups, unitary representations, Penrose transforms
SHIMOMURA, Akihiro	Analysis	functional analysis, Fourier analysis, partial differential equations
SHIRAIISHI, Jun'ichi	Solvable Lattice Models	elliptic quantum groups
TAKADA, Ryo	Partial Differential Equations	Euler equations, Navier-Stokes equations, geophysical flows
TANAKA, Hiromu	Algebraic Geometry	minimal model program, positive characteristic
TERADA, Itaru	Algebraic Combinatorics	Young diagrams, Robinson-Schensted correspondences, group representations
UEDA, Kazushi	Geometry	mirror symmetry
YOSHINO, Taro	Geometry of Lie Groups and Lie Algebras	Clifford-Klein forms, discontinuous groups proper action, topological blow-up

Assistant Professors

Name	Field of Interest	Keywords
ASOU, Kazuhiko	Mathematics Education	e-Learning, video-on-demand, instructional design
GOCHO, Toru	Differential Geometry	topological field theory, symplectic manifolds
KIYONO, Kazuhiko	Topology	group actions, gauge theory, Atiyah-Singer index theorem
MASE, Takafumi	Integrable Systems, Discrete Dynamical Systems	discrete integrable systems, integrability criteria for nonlinear discrete dynamical systems
TANAKA, Yuichiro	Representation Theory	Lie groups, slice for group action, invariant functions

University Professor

Name	Field of Interest	Keywords
KAWAMATA Yujiro	Algebraic Geometry	higher dimensional algebraic geometry

Project Professor

Name	Field of Interest	Keywords
ISHII, Shihoko	Algebraic Geometry, Singularities	jet schemes, arc spaces, log canonical singularities, minimal log discrepancy
KATSURA, Toshiyuki	Algebraic Geometry	algebraic varieties, positive characteristic, Abelian variety, Calabi-Yau manifolds, K3 surfaces, Enriques surface
KOHNO, Toshitake	Topology, Mathematical Physics	braid groups, quantum groups, conformal field theory
MURATA, Noboru	Machine Learning	signal processing, pattern recognition, statistical learning theory, information geometry
TAKEUCHI, Masahiro	Biostatistics	mathematical biostatistics, enrichment analysis, translational statistics, longitudinal analysis, Cox regression
YAMAMOTO, Masahiro	Inverse Problems, Fractional Differential Equations, Industrial Mathematics	inverse problems, uniqueness, stability, time-fractional differential equations
YANAGIDA, Eiji	Applied Analysis	reaction-diffusion systems, propagation phenomena, dynamic singularities

Faculty

Kavli Institute for the Physics and Mathematics of the Universe (KAVLI IPMU) Professors

Name	Field of Interest	Keywords
ABE, Tomoyuki	Arithmetic Geometry	p-adic cohomology, arithmetic D-modules, ramification theory
ITO, Yukari	Algebraic Geometry	resolution of singularities and the McKay correspondence
KAPRANOV, Mikhail	Algebra, Algebraic Geometry and Category Theory	operads, moduli spaces, secondary polytopes, algebro-geometric model spaces of paths and loops, Hall algebras, derived geometry
MILANOV, Todor	Representation Theory, Algebraic Geometry	quantum cohomology, Gromov-Witten invariants, mirror symmetry, period integrals, Kac-Moody Lie algebras, vertex algebras, integrable systems
NAKAJIMA, Hiraku	Geometry and Representation Theory	geometric representation theory, quiver varieties, gauge theory, moduli spaces
TODA, Yukinobu	Algebraic Geometry	derived category of coherent sheaves, Bridgeland stability conditions, Donaldson-Thomas invariants
YAMAZAKI, Masahito	High Energy Theory, Mathematical Physics, Integrable Models	string theory, quantum field theory, gauge theory, supersymmetry

Social Cooperation Program Mathematical sciences for refrigerant thermal fluids Project Professor

Name	Field of Interest	Keywords
GIGA, Yoshikazu	Nonlinear Analysis	Navier-Stokes equations, calculus of variation, viscosity solutions, level set method, nonlinear parabolic partial differential equations, crystal growth

Project Associate Professor

Name	Field of Interest	Keywords
HSU, Pen-Yuan	Partial Differential Equations	Navier-Stokes equations, vortex, tornado-like flow simulation



Graduate School and students from abroad

The Graduate School of Mathematical Sciences at The University of Tokyo has 155 graduate students as of March, 2024. The Graduate School of Mathematical Sciences accepts well-qualified students from around world. Approximately 12% of our graduate student body is international. Since the reorganization of our department in 1992, 124 foreign students have obtained Master's Degree, and 89 PhD degree so far, as in the table below.

The education of mathematicians for academia and society of the future is at the heart of our mission. Our wide range of courses at graduate level offers a rigorous training in mathematics. Traditionally our Graduate Program encourages students to start original research already from Master's Program.

Our department is one of the founding faculties of The University of Tokyo. The Department of Mathematics has become an independent department since 1881. The present organization is Graduate School of Mathematical Sciences, which was reorganized in 1992 as an expanded integration of mathematics departments.

The alumni of our department feature notable mathematicians including T. Takagi (one of the five committee members of the first Fields Medals, 1936), K. Kodaira (the recipient of the Fields Medal, 1954) and K. Ito (the first recipient of the Gauss prize, 2006). Our graduate school appoints about 55 faculty advancing mathematical knowledge by novel and insightful research that is world-leading.

Number of Students from abroad

Nationality / Region	Enrollment (as of May 1, 2024)		Degrees Conferred (1994.3~2024.3)	
	Master's Course	Ph.D. Course	Master's Degree	Ph.D.
Australia	0	0	1	1
Bangladesh	0	0	1	1
Brazil	0	0	2	1
Cambodia	0	0	1	0
Chile	0	0	1	0
China	4	9	84	60
Denmark	0	0	0	2
France	0	0	1	1
Germany	0	0	3	0
Greece	0	0	0	1
Israel	0	0	1	0
Mongolia	0	0	5	4
Philippines	0	0	0	1
Poland	0	0	1	0
Republic of Korea	1	1	7	5
Russia	0	0	0	1
Spain	0	0	2	2
Taiwan	1	0	3	3
Thailand	0	0	3	1
Turkey	0	0	1	1
Ukraine	0	0	1	1
United Kingdom	0	0	1	1
USA	0	0	2	0
Uzbekistan	0	0	1	0
Vietnam	0	0	1	2
Morocco	0	1	1	0
Total	6	11	124	89

French-Japanese Laboratory of Mathematics and its Interactions

Established on September 1, 2023, the French Japanese Laboratory of Mathematics and its Interactions (FJ-LMI) is a new center for cutting-edge mathematical research, based on the agreement between the French National Center for Scientific Research (CNRS), Europe's largest basic research institution, and the Graduate School of Mathematical Sciences of The University of Tokyo. This initiative aims to promote research cooperation and higher education in Mathematics between France and Japan.

The inaugural conference was held on April 4-5, 2024, which featured congratulatory speeches from President Fujii, Professor Dherisin, Deputy Director of CNRS Mathematics, and the Scientific Councilor from the French Embassy. Eight renowned researchers including Jean-Pierre Bourguignon, Étienne Ghys, and Claire Voisin, delivered lectures on various active topics in pure and applied Mathematics in the main lecture hall of our building.

For structuring international partnership CNRS offers tools such as International Emerging Actions (IEA), International Research Networks (IRN), International Research Projects (IRP), and International Research Laboratories (IRL). IRLs help structure highly localized international research collaboration. The Graduate School of Mathematical Sciences has established the French-Japanese Mathematics Laboratory (FJ-LMI) as an International Research Laboratory, marking the fifth such a structure at The University of Tokyo and the first IRL in Mathematics in Japan.

Over nearly a century, Japan and France have mutually inspired and contributed to each other's mathematical advancements. FJ-LMI aims to support and systemize the connections developed among individual mathematicians, starting with following four key research areas:

1. Number Theory and Algebraic Geometry;
2. Lie Group Theory, Geometric Group Theory, and Representation Theory;
3. Partial Differential Equations and Inverse Problems;
4. Applications of Mathematics to Biology and Life Sciences.

The Laboratory will facilitate long-term stays for French researchers in Tokyo. Its overarching goal is to deepen research cooperation and to foster young researchers in a wide range of mathematical fields between France and Japan. In addition to advancing mathematical research, this hub aims to create networks among researchers laying the foundation for international success.



April 2024 opening conference Professor E. Ghys, far right is President T. Fujii, and Professor C. Voisin.

Interdisciplinary Center for Mathematical Sciences (ICMS)

The Interdisciplinary Center for Mathematical Sciences (ICMS) was established in April 2013 and formally designated as an affiliated facility of the Graduate School of Mathematical Sciences in April 2015. Currently, ICMS consists of two divisions: the Academic Collaboration Division and the Social Collaboration Division. Since 2023, it has strengthened its structure by adding three deputy center directors. Furthermore, since 2021, it has established a social collaboration course sponsored by Daikin Industries, Ltd., with one special appointed professor, one special appointed associate professor, and faculty members concurrently appointed with the Graduate School of Mathematical Sciences involved in its operation.

The purpose of ICMS is to promote collaboration between mathematical sciences and various scientific and industrial fields, foster interdisciplinary research, and cultivate individuals capable of conducting cross-disciplinary research using mathematics. To achieve this goal, ICMS holds "Study Group Workshops for Solving Problems in Industry" to facilitate mathematical solutions to industrial challenges and promote collaborative research and cooperation with the industrial sector centered around mathematics. Additionally, it participates in events such as the "Math for Industry Platform (MfIP)," the "Keidanren Initiative for the Collaboration of Mathematics in Industry," and joint events organized by the Mathematical Society of Japan, the Japan Society for Industrial and Applied Mathematics, and the Federation of Statistical Mathematics Societies to promote interdisciplinary and interindustry research exchanges for young researchers specializing in mathematics and mathematical sciences. Together with domestic mathematical science-related institutions and academic societies, ICMS supports the utilization and public relations of mathematical sciences for social purposes.

Through ICMS workshops, new problems that mathematical sciences should tackle in industry and various scientific fields are explored, and the process is publicly shared online to facilitate widespread information sharing. ICMS also supports activities of the World-leading Innovative Graduate Study for Frontiers of Mathematical Sciences and Physics (WINGS-FMSP) and the Forefront Physics and Mathematics Program to Drive Transformation (FoPM) program, especially in "Mathematical Research on Real World Problems." Fostering the development of graduate students and young researchers is also a crucial mission of the center through these activities.

In December 2014, a career support office was established. Graduates from the Department of Mathematics and graduates from the Graduate School of Mathematical Sciences have significant opportunities to excel in various fields beyond academia. The support office promotes career development in a wide range of fields by organizing activities such as mathematical career design seminars, various consultations related to employment, arrangements for internships and joint research with companies, and visits to research institutes. It collaborates with other departments within the university to advance activities for career support on campus.



Panel discussions in ICMS workshops are recorded in graphics and are posted on its website.



Study Group Workshops for Solving Problems in Industry

1. About WINGS-FMSP

The University of Tokyo conducts the World-leading Innovative Graduate Study Program (WINGS) that is Doctoral Programs cooperated by several graduate schools and institutes in order to foster doctoral personnel who contribute to human society with high research power and expertise. The Graduate School of Mathematical Sciences conducts the Frontiers of Mathematical Sciences and Physics (WINGS-FMSP).

The key to innovation in sciences and society is the construction and renewal of the underlying mathematical theory. We aim to foster the next generation of mathematical science leaders who can create research areas that are centered on mathematics and spread in various sciences and deepen and create novel mathematical theories.

To join the WINGS-FMSP program, one must be a student at the University of Tokyo enrolled in the Master Course of one of the following eight Graduate Schools: Mathematical Sciences, Science, Economics, Frontier Sciences, Engineering, Information Science and Technology, Medicine, and Arts and Sciences.

2. Features of the WINGS-FMSP program

(1) The plural supervision system

Each student in this program is assigned a secondary supervisor, in addition to their main supervisor. Thanks to this system WINGS-FMSP students are able to get advice about their research from wider viewpoints.

(2) Financial support

Master's course: WINGS-FMSP course students may be appointed as TAKUETSU (Excellence) Research Assistants (TRAs) and be paid 120,000/150,000 yen per month as a salary in their master's program. The amount of a TRA salary for the first year is 120,000 yen per month and we decide by review in March whether the amount is increased to 150,000 yen per month from April.

Doctor's course: WINGS-FMSP course students may receive a monthly grant of 200,000 yen as a scholarship in their doctor's program. When a WINGS-FMSP student is accepted as a JSPS Research Fellow for Young Scientists, you are required to stay in WINGS-FMSP, while not receiving this scholarship.

(3) Qualifying Examination

A Qualifying Examination (QE) will be conducted intended for current WINGS-FMSP M2 students to select those permitted to remain in the program as Doctoral students. M2 students will submit their master thesis in January in the second year of the Master course. Further, a part of QE, we will work on a poster-presentation according to the following guidelines.

- Poster-presentation and the Q&A session will be conducted in person.
- M2 students will be asked to submit their posters. We request that the contribution to the field (for specialists) and the research's motivation (for non-specialists) should be explained.
- WINGS-FMSP instructors, faculty members, and all course students can read posters and ask questions.
- At the end of the period, the course students will revise the poster and submit the final version based on the Q&A session results.
- The record of discussions and the final version of the poster will be evaluated.
- The final version of the poster will be published in the WINGS-FMSP annual report.

(4) Required activities for the Doctoral years

To complete the WINGS-FMSP course, students must take part in one of the two activities listed below:

- Research at institutions abroad or a corporate internship.
- Frontiers of Mathematical Sciences and Society III (coursework).

3. Coursework and activities beyond the boundaries of research areas

For acquiring depth and width in the synergy between mathematics and various sciences, we need to have a global viewpoint, beyond the boundaries of research areas. From this point of view, in the WINGS-FMSP program we organize course works “Frontiers of Mathematical Sciences and Physics” and “Frontiers of Mathematical Sciences and Society”. We also organize seminars and tutorial workshops, removing traditional boundaries between disciplines. We set up various occasions such as “study groups (SG)”, where students learn about problems in industry and work together on these problems.



TIC, Daikin Industries tour (September 29, 2022, Settsu City, Osaka)



The Workshop of Practical Research in Mathematical Sciences (October 28, 2023, Shibuya QWS)

Lectures and Seminars

Lectures

Algebra	Introduction to Algebra, Algebraic Geometry, Number Theory, Automorphic Functions, Analytic Number Theory, Applied Algebra
Global Geometry	Introduction to Global Geometry, Differential Geometry, Topology, Global Analysis, Complex Manifolds, Dynamical Systems
Basic Analysis	Introduction to Basic Analysis, Linear Differential Equations, Spectral Theory, Algebraic Analysis, Stochastic Analysis, Functional Analysis
Mathematical Structures	Introduction to Mathematical Structures, Algebraic Structures, Group Structures, Lie Algebras, Infinite Dimensional Structures, Representation Theory
Mathematical Analysis	Introduction to Mathematical Analysis, Nonlinear Analysis, Stochastic Processes, Numerical Analysis, Mathematical Statistics, Mathematical Control Theory
Discrete Mathematics	Introduction to Discrete Mathematics, Mathematical Logic, Foundations of Mathematics, Information Theory, Computational Mathematics, Combinatorics
Others	Special Lectures on Mathematical Sciences

Seminars

Master's Program:

Interdisciplinary Seminar, Basic Seminar, Advanced Seminar, Multi-Disciplinary Seminar

Ph.D. Program:

Ph.D. Seminar on Mathematical Sciences, Special Advanced Seminar

Degrees

Master of Mathematical Sciences

Ph.D. (Mathematical Sciences)



Facilities

Library

- The present collection includes:
about **162,000** volumes and **1,700** periodicals.
The library is used by a large number mathematicians from all over the world.

International Exchange

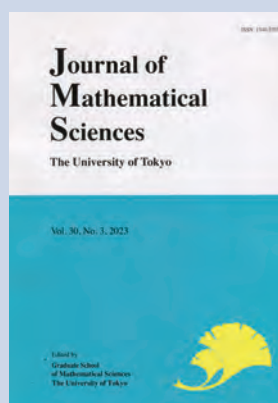
- Foreign visitors between April 2023-March 2024
Long-term (more than one month) **1** visitors
Short-term (less than one month) **68** visitors

Number of Students (per year)

- Undergraduate students : **45**
- Master's program : **53** (with at least **6** foreign students)
- Ph.D. program : **32** (with at least **3** foreign students)

Publications

- Journal of Mathematical Sciences
- Lecture Notes in Mathematical Sciences
- Annual Report



Seminars for Researchers

The Departmental Colloquium is held once every month. It had a long history as the “Friday Colloquium” before the formation of the new department. Speakers include distinguished experts in various areas of mathematical sciences as well as members of the department. The talks are expected to be accessible to non-specialists in the field and students are encouraged to attend to broaden their mathematical background.

In addition, the following research seminars are organized by members of the department according to their specialties. Most of them are held on a weekly basis and last for an hour or two. They provide opportunities for mathematicians in the Tokyo area to meet and talk face to face. Currently these include the seminars listed below.

- Algebraic Geometry
- Applied Analysis
- Classical Analysis
- Demography and Mathematical Biology
- Discrete mathematical modelling seminar
- Geometric Complex Analysis
- Integrable Systems
- Lie Groups and Representation Theory
- Mathematics for Various Disciplines
- Number Theory
- Numerical Analysis
- Probability and Statistics
- Topology



Colloquium



Seminar on Geometric Complex Analysis



Common Room

Access

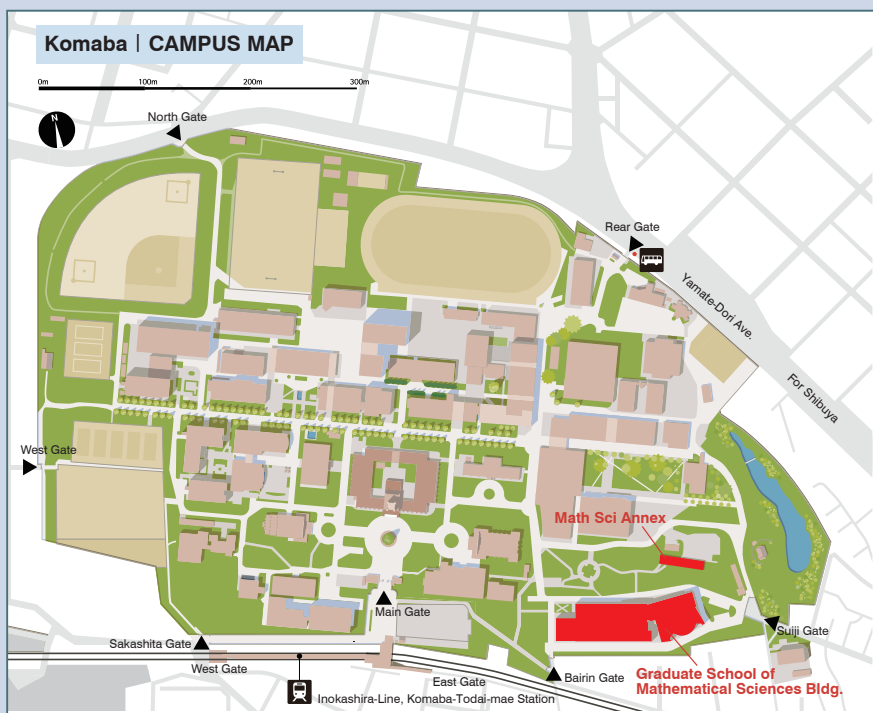
Komaba Campus

Address: Graduate School of Mathematical Sciences
The University of Tokyo
3-8-1 Komaba Meguro-ku Tokyo 153-8914 JAPAN

Tel: 03-5465-7001
(from overseas: +81-3-5465-7001)

Fax: 03-5465-7011
(from overseas: +81-3-5465-7011)

Location: Mathematical Sciences Building
2 min. walk from Komaba-todaimae Station
(Keio Inokashira Line)

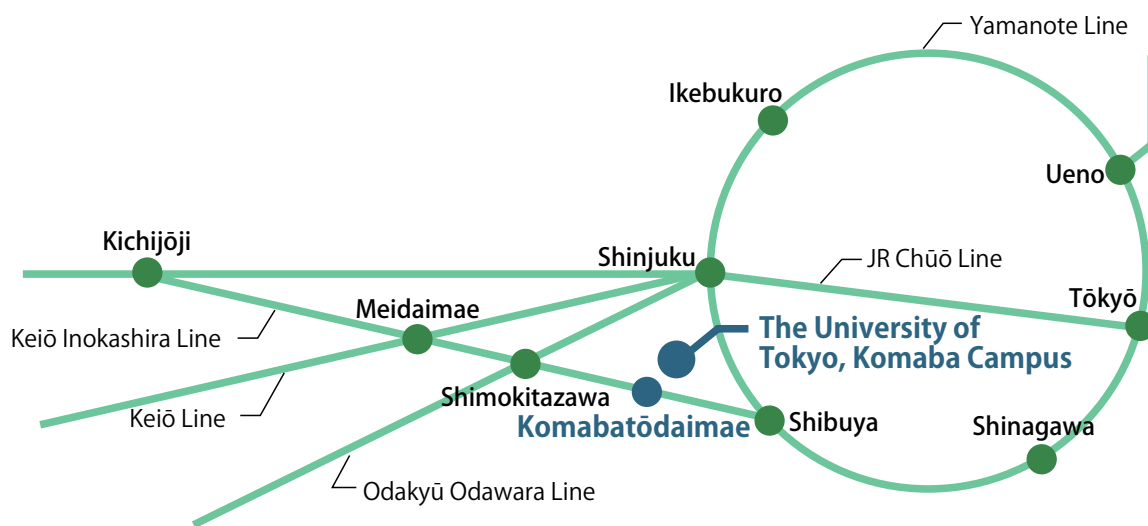
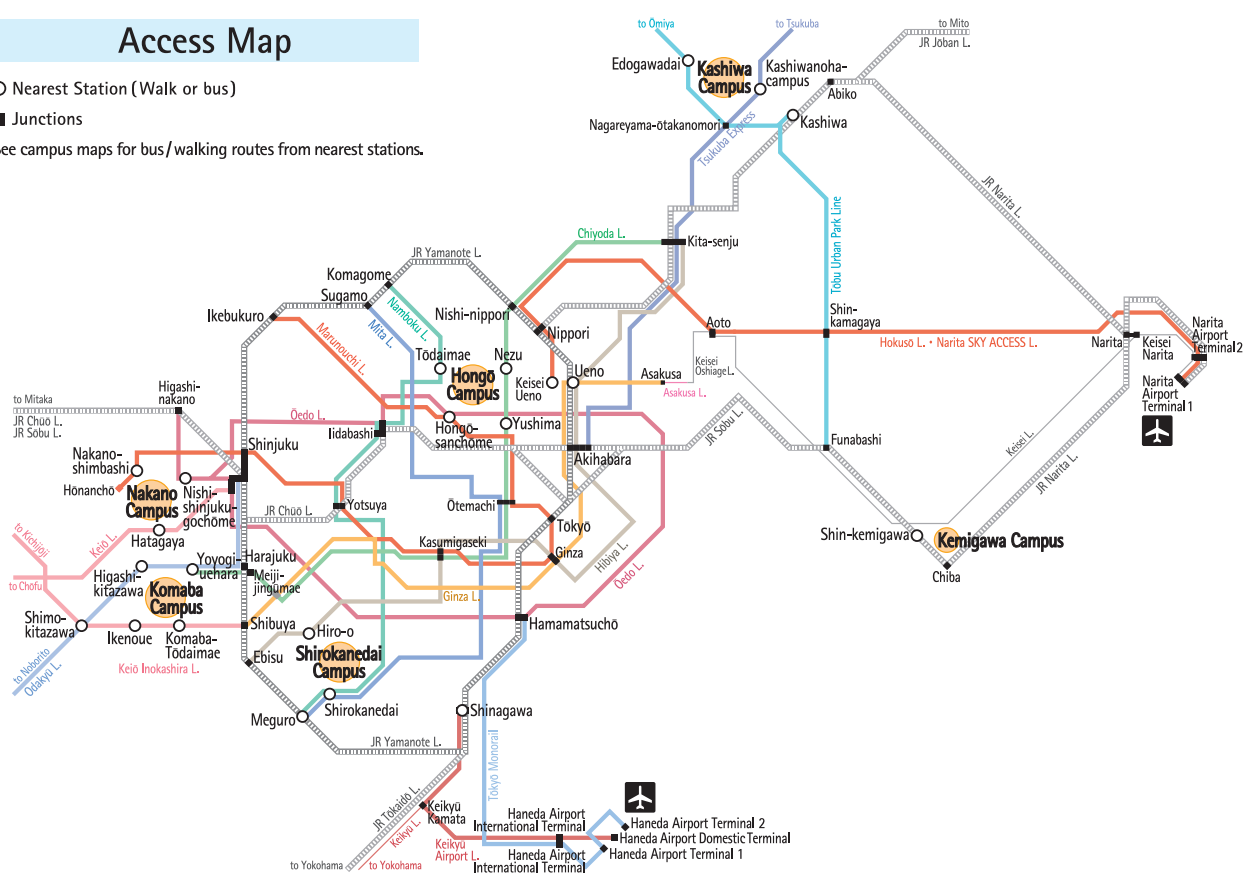


Access Map

☐ Nearest Station (Walk or bus)

Junctions

See campus maps for bus/walking routes from nearest stations





Graduate School of Mathematical Sciences
The University of Tokyo

3-8-1 Komaba Meguro-ku
Tokyo 153-8914, JAPAN
Tel: 03-5465-7001 (from overseas: +81-3)
Fax: 03-5465-7011 (from overseas: +81-3)
<http://www.ms.u-tokyo.ac.jp>
Published in 2024