

Kawaramachi Station (Hankyu)	(For Shijo-Kawaramachi/Ginkakuji)	
Karasuma Line (Subway) Imadegawa Station	Kyoto City Bus No. 203 (For Ginkakuji/Kinrin Shako)	"Kyodai Nogakubu-mae" "Kitashirakawa"
Demachiyanagi Station (Keihan)	Kyoto City Bus No. 17 (For Ginkakuji/Kinrin Shako) Kyoto City Bus No. 203 (For Ginkakuji/Kinrin Shako)	



Kyoto University Research Institute for Mathematical Sciences

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Kyoto University Research Institute for Mathematical Sciences 2017-2018



Research Institute for Mathematical Sciences 2017-2018

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Message from the Director



RIMS Director Michio Yamada

Research Institute for Mathematical Sciences (RIMS) was established in 1963 as a cooperative research institute affiliated to Kyoto University for the purpose of accelerating research in mathematical sciences. The aim of RIMS is to promote fundamental research in the mathematical sciences. In order to achieve this, RIMS functions in three ways, namely as a research institute, as a graduate school and as a research center for cooperative research. RIMS provides services for the convenience of cooperative research projects widely throughout Japan and the world, along with research activities and postgraduate education in mathematical sciences.

Mathematics is related to a great number of sciences and technologies, playing an essential role in supporting the human world as we know it today. A wide range of fields in mathematics, such as algebra, geometry and analysis, have been contributed to various aspects of our civilization, including communication networks, financial systems, traffic and transportation systems, electronic and medical equipment and household appliances. Further, in addition to such engineering technologies, mathematics provides powerful tools in understanding and describing the workings of life, the mechanism of the universe, and even social science phenomena. In the 21st century, the development of computers and networks, and accumulation of massive data require higher applications of mathematics in creating, underpinning and realizing new ideas.

However, increasing demand in application fields is not the only reason for the development of mathematics. There are many examples of theories which were created purely from mathematical perceptions and are widely applied for practical purposes today. The theory on field extension created by Galois in the beginning of the 19th century, now supports the various codes of modern network communications. Non-Euclidean geometry, which was regarded as a heresy thought in the 19th century, gave birth to present-day GPS technology through the theory of general relativity. The spectral theory of partial differential operators in 19th century set the stage for quantum mechanics in the 20th century, and the topological group theory in the early 20th century led to modern methods of data and image analysis. Research in pure mathematics leads through long ways to vast range of applications, because pure mathematics is able to drastically change one's perspectives and establish a deep universality and integrity of mathematics. The relationship between applied mathematics and pure mathematics are like that between the many leafy branches and the deep roots of one tree, which influence each other and their mutual interaction is indispensable for further development of mathematics.

Since its foundation half a century ago, RIMS has served as a comprehensive institute for both mathematics and mathematical sciences for half a century, now with around 40 faculty members (12 professors) and more than 10 post-doctoral fellows, nearly two thirds of which is for pure mathematics, and the rest for applied mathematics including optimization theory, mathematical physics, fluid dynamics and theoretical computer sciences. RIMS consists of three major divisions of basic mathematical sciences, infinite analysis and applied mathematical sciences, together with the Computer Laboratory. Also, Research Center for Quantum Geometry (since 2012), Mathematics Coordination Center (since 2013) and Preparatory Center for Research in Next-Generation Geometry have been established in order to reinforce research to create new geometry as well as to promote mathematical innovations through collaborations with a wide range of scientific fields. RIMS makes efforts to create and keep better research environment, and the activities of RIMS members are highly appreciated in the world, which is endorsed by the awarding of two Fields medals, a Gauss medal and two Wolf prizes to current and emeritus members of RIMS. In addition, RIMS has a graduate school for mathematics and mathematical sciences together with the Division of Mathematical Sciences of Kyoto University.

Also, since its establishment, RIMS has been serving as an institute to host joint cooperative researches in mathematical sciences for researchers from all over Japan and the world. Since 2010 RIMS is certified as a Joint Usage/Research Center (JU/RC) by the Ministry of Education, Culture, Sports, Science and Technology, Japan. Now every year, as JU/RC, RIMS hosts around 80 RIMS Workshops in mathematics and mathematical sciences with more than 4000 participants, among which more than 300 participants are from abroad to make short- and long-term visits for international cooperative research. Another JU/RC program which RIMS conducts is the International Project Researches which are held every year on specific mathematical themes consisting of several workshops and conferences. In the third Medium-Term Plan of Kyoto University starting in 2016, RIMS begins international recruitment for RIMS Workshops aiming at further promotion of international cooperative researches, and plans to extend the international recruitment to other JU/RC programs. RIMS is making efforts to contribute to further developments in mathematics and mathematical sciences in the 21st century.

What is Mathematical Science?

Many problems raised in academic fields such as natural science and social science require mathematical approaches. Some of them cannot be resolved with existing mathematical methods, thereby demanding the development of new methods and creation of new theories. For instance, the development of calculus to solve problems in mechanics is a remarkable example in history. New such methods and theories originated in physics and engineering have gone behind the resolution of initial problems and have been reborn and developed as new general theories in mathematics, which have found applications in other fields. Mathematical Science is the field promoting such research.

Vision and Goal of Our Research

The mission of Research Institute for Mathematical Sciences (RIMS) is to serve as a center of international research in mathematics and mathematical science and reinforce its functions.

The members of RIMS are conducting a wide range of research from fundamental to applications, whose research topics are closely interrelated and their interactions lead to creation of new research areas. RIMS is the only center in Japan for joint usage and joint research concerning mathematical sciences. The institute conducts collaboration activities including workshops and seminars and hosts about 4,000 researchers every year. As part of joint usage/research activities RIMS organizes international research projects on selected research themes for each year, which have yielded several research outputs and provided opportunities for young researchers. These joint usage/research activities, run by the Advisory Board in which external members hold a majority, are selected from publicly solicited proposals via objective assessment.

Publications of Research Results

Publications of the Research Institute for Mathematical Sciences is an internationally recognized periodical academic journal which receives many contributions from overseas. RIMS Kôkyûroku publishes the results of joint research/usage activities. Since 2007, RIMS publishes a new series of Lecture Notes called "Kôkyûroku Bessatsu", which are special issues of RIMS Kôkyûroku. RIMS Letter is electronically distributed twice a year for promoting the publicity of activities at RIMS.

Since 1976 RIMS organize Introductory Public Lectures once a year, which introduces modern mathematics to general audience including high school students as well as senior citizens. The lecture notes of previous lectures are available from the RIMS web site.

April	1958	The 26th General Assembly Meeting of the Sc RIMS.
April	1963	RIMS was founded as a joint usage research in conducting general research in mathematical s (Fundamental Mathematics Research Division established.
April	1964	Two research divisions (Fundamental Mathem Research Division One) were established.
April	1965	Two research divisions (Non-Linear Problem Division Two) were established.
April	1966	Two research divisions (Approximation Theorem were established.
April	1967	One research division (Computer Research Divere completed.
April	1971	The Applied Mathematical Programming Inst
April	1975	The Division of Mathematical Sciences was est Science.
April	1978	The Global Analysis Research Division was est
April	1980	The Mathematical Science Research Division
April	1984	The Algebraic Analysis Research Division (with
May	1989	The Mathematical Physics Research Division
April	1992	The Algebraic Variety Research Division (with
April	1994	Due to the reorganization of the Graduate Sch Mathematical Sciences was established. The D Department of Mathematical Sciences in this
June	1994	The Field of Algebraic Analysis Research Divi the Algebraic Analysis Research Division, whi
April	1995	The Applied Mathematics Research Division (limit) was established.
April	1999	Due to reorganization, RIMS consists of three Research Division, Infinite Analysis Research and one attached institute (Applied Mathemat
April	2004	The Applied Mathematical Programming Inst Computer Laboratory.
April	2006	The Center for Research in the Frontiers of M
October	2007	The Mathematical Science Joint Research Div years) commemorating the awarding of the Ca
April	2010	RIMS was certified as an advanced Joint Usage science (for 6 years).
April	2012	The Research Center for Quantum Geometry Research in the Frontiers of Mathematical Sci Interaction in Mathematical Sciences.
May	2013	The Liaison Center in Mathematics was establ
April	2016	The certification of the advanced Joint Usage / science was renewed (for 6 years).

tience Council of Japan (SCJ) approved the founding of

stitute attached to Kyoto University for the purpose of cience. In the initial year, two research divisions n One and Operator Theory Research Division) were

matics Research Division Two and Applied Analysis

Research Division and Applied Analysis Research

ry Research Division and Numerical Analysis Division)

ivision) was established. A total of nine research divisions

titute attached to RIMS was established.

tablished in the Kyoto University Graduate School of

tablished.

(with a visiting professor from overseas) was established

th a 10-year limit) was established.

(with a 10-year limit) was established.

a 10-year limit) was established.

nool of Science, the Division of Mathematics and Division of Mathematical Sciences is subsumed by the new division.

ision (with a 10-year limit) was established (in the place of ich was abolished).

(with a visiting professor from overseas) (with a 10-year

major research divisions (Fundamental Mathematics Division, and Applied Mathematics Research Division) tical Programming Institute attached to RIMS).

titute attached to RIMS was re-established as the

Iathematical Science was established (Internal process).

ision (with the Nomura Group) was established (for 3 arl Friedrich Gauss Prize to Dr. Kiyoshi Ito.

e / Research Center of mathematics and mathematical

was established (internal process). The Center for ence changed its name to the Center for Research

lished (internal process).

Research Center of mathematics and mathematical

Organization

Director	Deputy Director
	Executive Board
	Consists of the director, professors, and a few professors of Kyoto University, and deliberates and decides matters important for the institute.
	Advisory Board Technical Committee
	Consists of selected professors and researchers from inside and outside Kyoto University, and responds to the important questions on the operation of the RIMS posed by the director.Consists of selected professors, associate professors, senior lecturers, and researchers from inside and outside Kyoto University, and deliberates the joint usage of the institute.
	Faculty Meeting Various Committees Consists of the director and professors, and deliberates and reviews important matters concerning the institute.
	Research Divisions Fundamental Mathematics Research Division Infinite Analysis Research Division Applied Mathematics Research Division
	Attached Institutes Computer Laboratory Center for Research Interaction in Mathematical Sciences (Internal process) Research Center for Quantum Geometry (Internal process) Liaison Center in Mathematics (Internal process)
	Administrative Office General Affairs Section
	Administrative Director

Category	Professor	Associate Professor	Senior Lecturer	Assistant Professor	Sub-Total	Program-Specific Assistant Professor	Program-Specific Researcher	Administrative Staff	Technical Staff	Total
Fundamental Mathematics	(1)				(1)					(1)
Research Division	3	3	1	3	10					10
	[2]				[2]					[2]
Infinite Analysis Research Division		(1)			(1)					(1)
	5	3	1	4	13					13
Applied Mathematics Research Division	4	2	2	3(*1)	11 (*1)					11 (*1)
Computation Mechanism Research Institute		1		1	2				2	4
Administrative Bureau								11		11
Others						3				3
	[2]				[2]					[2]
Total	(1)	(1)			(2)					(2)
	12	9	4	11 (*1)	36(*1)	3	0	11	2	52

(*1) indicates the number of Program-Specific Assistant Professors included in the number of Assistant Professors. The numbers in [] are the numbers of domestic visiting professors and the numbers in () are the number of overseas visiting professors, which are not included in the total.

Fundamental Mathematics Research Division

Fields: Number theory, algebraic geometry, topology, algebraic analysis, computation mechanism theory, etc.

This division investigates the fundamentals of mathematics including the systems of numbers, structures of spaces and functions, and laws of computation and reasoning with the intention of promoting the development of mathematics and its applications in various ways and to provide them with solid research foundations.





Researchers

Associate Professor	ARAKAWA, Tomoyuki (Algebra/representation theory and vertex operator algebras)
Senior Lecturer	YAMASHITA, Go (Arithmetic geometry)
Assistant Professor	NAGATA, Masatsugu (Topology)
Assistant Professor	KAWANOUE, Hiraku (Algebraic geometry)
Assistant Professor	FUJITA, Kento (Algebraic geometry)

Infinite Analysis Research Division

Fields: Infinite dimensional analysis, infinite symmetry, global analysis, geometric structure, probability structure, etc.

With the objective of analyzing systems with an infinite degree of freedom, which is an important research issue of mathematical science, this division pursues introducing developments in quantum physics and statistical physics, and at the same time providing them with systematic and accurate mathematical foundations.

Researchers Professor MUKAI, Shigeru (Algebraic geometry and vector bundle) Professor TAMAGAWA, Akio (Number theory and Arithmetic geometry) Professor MOCHIZUKI, Shinichi (Arithmetic geometry and anabelian geometry Professor NAKAJIMA, Hiraku (Geometry and representation theory) Professor KUMAGAI, Takashi (Probability theory) Associate Professor KAWAI, Toshiya (Quantum field theory, string theory, and mathematical physics)

Associate Professor TAKEHIRO, Shin-ichi (Geophysical fluid dynamics)

Associate Professor	FUKUSHIMA, Ryoki (Probability theory)
Associate Professor	HOSHI, Yuichiro (Arithmetic geometry)
Assistant Professor	HELMKE, Stefan (Algebraic geometry)
Assistant Professor	OOURA, Takuya (Numerical analysis)
Assistant Professor	YOKOTA, Takumi (Differential geometry)
Assistant Professor	KOSHIKAWA, Teruhisa

Applied Mathematics Research Division

Fields: Theory of differential equations, mathematical physics, discrete systems, large-scale calculation, complex systems, etc.

Through interaction with natural science, engineering, social science, and other scientific fields involving mathematics, this division aims to return the results of research back to these fields for their development by investigating the mathematical issues found in the fields.

Researchers							
Professor	YAMADA, Michio (Fluid mechanics and wavelet analysis)		Senior Lecturer	KISHIMOTO, Nobu (Nonlinear partial differential equations)			
Professor	Professor HASEGAWA, Masahito (Theoretical computer science and software science) Professor OZAWA, Narutaka (Theory of operator algebras and theory of discrete groups)		Senior Lecturer	TAN, Fucheng (Arithmetic geometry and Galois representations)			
Professor			Assistant Professor	IRIE, Kei (Geometry)			
Professor MAKINO, Kazuhisa (Discrete mathematics, optimization, and theory of algorithms)			Assistant Professor	HIKITA, Tatsuyuki (Geometric representation theory)			
Associate Professor	SAITO, Morihiko (Algebraic analysis)		Program-Specific Assistant Professor	ISONO, Yusuke (Theory of operator algebras)			
Associate Professor	KAWAKITA, Masayuki						





Research Institute for Mathematical Sciences, Kyoto University

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Computer Laboratory

This laboratory is conducting research and development of advanced software technology based on theoretical results.

Researchers

Director (joint appointment)	HASEGAWA, Masahito (Theoretical computer science and software science)
Associate Professor	TERUI, Kazushige (Mathematical logic and theoretical computer science)
Assistant Professor	HOSHINO, Naohiko (Theoretical computer science)

The computer system of the institute, used not only by the members of the institute but also by many visitors and collaborators, is administered and maintained by dedicated technical staff, and is quite stable and reliable. The high-speed computer for scientific calculation installed at this institute is a parallel computer with 18 nodes and 216 cores. It is used to solve problems in applied mathematics including fluid mechanics and has been producing new results one after another. (Figure 1 shows two-dimensional turbulence.) High-performance workstations are also used to conduct basic research in computer science, which has resulted in new theories on computation and leading-edge software based on those theories. (Figure 2 illustrates the implementation of a program using the geometry of interaction.)



Figure



Center for Research Interaction in Mathematical Sciences

For the purpose of promoting research exchange between excellent researchers from inside and outside Japan by providing them with an environment for collaborative research, this faculty was established based on the former Center for Research in the Frontiers of Mathematical Science in April 2012. The project faculty members, both paid and unpaid, conduct research in cooperation with the members of RIMS during a term of 2 to 3 months to 5 years in a research environment similar to those of the members of RIMS.

Research

Project Professor FUJISHIGE, Satoru Project Professor FUJIKI, Akira Project Professor IWAMA, Kazuo Project Professor KIRILLOV, Anatoli Project Assistant Professor SUZUKI, Sakie Project Assistant Professor ISHIMOTO, Kenta

Research Center for Quantum Geometry

With the intention of accelerating research in quantum geometry, a new field of mathematics, this research center was founded in April 2012. It aims at significant progresses in the study of quantum geometry through collaborative research by domestic and overseas researchers.

Researchers

Director	NAKAJIMA, Hiraku
(joint appointment)	(Geometry and representation theory)
Professor	MOCHIZUKI, Takuro
(joint appointment)	(Differential geometry and algebraic geometry)
Project Professor	KASHIWARA, Masaki (Algebraic analysis)

Liaison Center in Mathematics

For the purpose of conducting collaborative research with researchers from other academic fields and with companies, this center was founded in May 2013. Its mission is the application of mathematics.

Researchers

Director (joint appoint	nent) YAMADA, Michio		
Project Pro	Fessor KOKUBU, Hiroshi	Professor (joint appointment)	YAMADA, Michio
Project Pro	essor SAKAJO, Takashi	Professor (joint appointment)	YAMADA, Michio
Project Pro	essor MATSUDA, Fumihiko	Professor (joint appointment)	KUMAGAI, Takashi
Project Pro	fessor YAMADA, Ryo	Professor (joint appointment)	KUMAGAI, Takashi

For the purpose of fostering young researchers for the next generation, this center employs program-specific non-tenured faculty members who will work with specific programs and projects as shown below.

Project	Creation of new geometry that enhances the capab
	- Establishment of a leading role in mathematics
	Program-Specific Assistant Professor SHIMIZU, Tatsu
Project	New deployment of algebraic geometry from the v
	Program-Specific Assistant Professor YOSHIDA, Yuta
Project	Mathematics of the moduli spaces of algebraic vari

Program-Specific Assistant Professor SANNAI, Akiyoshi (April 1, 2017 to March 31, 2018)

ore		
	Professor (joint appointment)	MAKINO, Kazuhisa
	Professor (joint appointment)	MUKAI, Shigeru
	Professor (joint appointment)	MAKINO, Kazuhisa
	Professor (joint appointment)	MUKAI, Shigeru
Associat	e Professor (joint appointment)	HABIRO, Kazuo
	Professor (joint appointment)	YAMADA, Michio

Project Professor	MORI, Shigefumi (Algebraic geometry)
Project Assistant Professor	SHIMIZU, Tatsuro (Topology)
Project Assistant Professor	YOSHIDA, Yutaka (Mathematical physics)

pility of research in cutting-edge mathematics

uro (May 16, 2014 to March 31, 2019)

iewpoint of mathematical physics

ka (November 1, 2016 to March 31, 2021)

ieties and self maps

Joint Usage Research

To promote mathematical science research in Japan, this institute is serving as a Joint Usage/Research Center that provides researchers nationwide in the related fields with opportunities and assistance for various joint usage. Joint usage research plans are publicly solicited once a year. The proposals are reviewed and adopted by the technical committee and advisory board.

In addition, for important and urgent plans that are drawn up when excellent researchers come from overseas, considerations are given so that they will be implemented efficiently as special plans.



Form of Joint Use Research

RIMS Joint Research (Open)

Open joint research on a specific theme is conducted for several days at this institute. The research program will be distributed to the organizations concerned beforehand.

The program will be posted on the Web site of this institute: http://www.kurims.kyoto-u.ac.jp/~kyodo/workshop-ja.html

RIMS Joint Research (Group)

A group of two or more researchers will conduct research as joint use researchers for 1 to 2 weeks at this institute.

RIMS Gasshuku-style Seminars

This is a workshop where researchers from inside and outside Japan can gather and discuss under the same roof. Its purpose is to contribute to a quantum leap in each field of research and the development of next-generation leaders. (This project started in 2008, and since 2016, international recruitment has been performed as part of the internationalization of the center activities.)

Long-term researchers

These researchers conduct research as joint usage researchers for two weeks or more at this institute. One of the important purposes is to exchange opinions with nearby researchers.

Implementation of Joint Usage Research



Results of Joint Usage Research

Kôkyûroku Bessatsu (see the section on publications) issued by RIMS, as well as published in domestic and overseas academic journals.



Seminar Camp Photos

Many of the results of joint usage research will be assembled in papers and included in RIMS Kôkyûroku and RIMS

International Research Projects

As a collaborative research activity unique to RIMS, since conducted for one fiscal year.

Fiscal Year	Research Theme Number of Parti	cipants
Fiscal 2002	Stochastic Analysis and Related Topics	404
Fiscal 2003	Complex dynamics	280
Fiscal 2004	Method of Algebraic Analysis in Integrable Systems	247
Fiscal 2005	Mathematics of the Navier-Stokes Equations and its Applications	468
Fiscal 2006	Arithmetic Algebraic Geometry	213
	Theoretical Effectivity and Practical Effectivity of Gröbner Bases	288
Fiscal 2007	Mirror Symmetry and Topological Field Theory	286
Fiscal 2008	Discrete Structures and Algorithms	378
	On the Resolution of Singularities	101
Fiscal 2009	Mathematical Finance	253
	Qualitative Study on Nonlinear Partial Differential Equations of Dispersive Type	127
Fiscal 2010	Perspectives in Deformation Quantization and Noncommutative Geometry	250
	Functions in Number Theory and their Probabilistic Aspects	202
Fiscal 2011	Operator Algebras and their Applications	351
	Minimal models and extremal rays	245
Fiscal 2012	Discrete Geometric Analysis	278
	Emerging Applications of Highly Accurate Method of Numerical Computation	111
Fiscal 2013	Moduli Theory	195
	Fluid Dynamics of Large-Scale Flows	113
	Dynamical Systems: New Directions in Theory and Applications	262
Fiscal 2014	Toward a new fusion research of mathematics and materials science	76
	Geometric Representation Theory	113
Fiscal 2015	Stochastic Analysis	203
	New Frontiers in Theoretical Computer Science	489
Fiscal 2016	Fluid Dynamics of Near-Wall Turbulence	88
	The prospects for Gröbner bases	135
	Differential geometry and geometric analysis	142
Fiscal 2017	Mathematical Analysis of quantum mechanics and related topics	
Fiscal 2018	Vertex operator algebras and symmetries	

International Exchange

RIMS as a Center for International Joint Research

As the largest center of international joint research in the field of mathematical science in Japan, prominent researchers from overseas come and stay at this institute. It serves as a place for domestic and overseas researchers to conduct collaborative research. Its activities have earned international acclaim including a comment in the Notice of the AMS, 2004, "RIMS, an Institute for Japan and the World."

Specific activities include receiving researchers of mathematical science from overseas universities and research institutions as visiting professors or guest scholars invited to Kyoto University, guest research associates, or short-stay visiting research scholars. These guest scholars stay for around a week to half year and are received in various forms. Three hundred or more researchers are received every year including the overseas researchers coming to conduct joint usage research. The institute also actively accepts foreign students.

Inviting overseas researchers, on which the institute concentrates its efforts, is expected to promote interactions with domestic researchers through international joint research by systematic coordination with joint usage research such as international symposiums (held around 10 times every year as part of a joint usage research project) in which many overseas researchers participate. In recent years, proposals for joint usage research projects have been solicited internationally to encourage further internationalization of the center activities to promote stay-type joint research.

Number of Visitors from Overseas

Country	Fiscal 2012	Fiscal 2013	Fiscal 2014	Fiscal 2015	Fiscal 2016
United States	65	72	56	71	79
United Kingdom	27	16	15	18	26
Italy	9	6	8	5	9
India	2	4	2	9	3
Australia	6	0	5	5	13
Canada	7	10	7	5	10
South Korea	32	45	21	31	29
Sweden	4	0	0	0	2
China	19	20	18	44	33
Denmark	0	1	0	0	1
Germany	19	11	22	19	22
France	40	37	38	38	32
Russia	9	6	15	4	6
Others	93	87	76	80	76
Total	332	315	283	329	341

Changes in Overseas Visitors





Due to the major divisional change in April 1999, the position of overseas visiting professor was provided in each of the three major research divisions. Researchers from each field of mathematical science invited from overseas stay for a long time through the year and conduct joint research with domestic researchers.

Name (University)	Tenure
MANNEVILLE, Paul (Ecole polytechnique)	2016. 4. 1 - 2016. 7. 3
MATHIEU, Pierre (Universite d'Aix-Marseille)	2016. 4.10 - 2016. 7.10
MATSUKI, Kenji (Purdue University)	2016. 5.16 - 2016. 8.15
OHKITANI, Koji (The University of Sheffield)	2016. 5.30 - 2016. 8.31
SAIDI, Mohamed (University of Exeter)	2016. 6.29 - 2016. 9.29
WILLIAMSON, Geordie (Max Planck Institute for Mathematics)	2016. 9. 1 - 2016.12.15
LEE, Yongnam (Korea Advanced Institute of Science and Technology)	2016. 9. 5 - 2017. 1. 4
MICHALEK, Mateusz (Polish Academy of Sciences)	2016.10.1 - 2016.12.15
DOUGLAS, Craig Carl (University of Wyoming)	2017. 1. 6 - 2017. 4. 5

* Only those in place in fiscal 2016

Distinguished Visiting Professors

As part of the efforts for assisting the Top Global University Project at Kyoto University, professors with high international reputations including Fields Medal winners are received as distinguished visiting professors. They conduct research and teach students with the staff of Kyoto University, as well as participate in a wide range of education including special lectures.

Name (University)	Tenure
JONES, Vaughan Frederick Randal (Vanderbilt University)	2016. 3.29 - 2016. 4.24
HACON, Christpher Derek (University of Utah)	2016. 6.11 - 2016. 7.10
FEIGIN, Boris (National Research University Higher School of Economics)	2016. 6.12 - 2016. 9. 5
CROWDY, Darren Greg (Imperial College London)	2016. 8.28 - 2016. 9.29
POPA, Sorin (University of California Los Angeles)	2016. 8.29 - 2016. 9.24
DEMBO, Amir (Stanford University)	2016.10.24 - 2016.11.23
GUSTAFSON, Stephen James (The University of British Columbia)	2017. 1.22 - 2017. 1.28
ALEXEEV, Valery (University of Georgia)	2017. 3.16 - 2017. 4.24
HIGSON, Nigel (The Pennsylvania State University)	2017. 3.20 - 2017. 5.27

* Only those invited in fiscal 2016

Academic Exchange Agreements

As part of the activities of the center of international research, the following academic exchange agreements have been concluded for the purpose of promoting and developing research collaborations in the fields of mathematical science.

Target Organization	Country	Date of Conclusion
International Institute for Advanced Studies	Japan	April 1, 1997
Korea Institute for Advanced Study (KIAS)	South Korea	March 10, 2000
Department of Mathematical Sciences, Seoul National University (SNU)	South Korea	June 23, 2006
Osaka City University Advanced Mathematical Institute	Japan	March 5, 2007
Pacific Institute for the Mathematical Sciences (PIMS)	Canada	March 30, 2009
National Institute for Mathematical Sciences (NIMS)	South Korea	June 24, 2010
Hausdorff Center for Mathematics, University of Bonn (HCM)	Germany	February 14, 2011
Tohoku University Advanced Institute for Materials Research	Japan	November 1, 2012
The CAU Nonlinear PDE Center, Chung-Ang University	South Korea	June 4, 2013
National Center for Theoretical Sciences (NCTS)	Taiwan	July 25, 2014
College of Science, University of Utah	United States	October 13, 2016
Higher School of Economics, National Research University	Russian Federation	June 2, 2017

Graduate Education and Conferment of Degrees

This institute aims to develop unique young researchers who belong to the Department of Mathematical Sciences of the Division of Mathematics and Mathematical Sciences in the Graduate School of Science, Kyoto University. In connection with this, the institute implemented the 21th Century COE Program, Formation of an International Center of Excellence in the Frontiers of Mathematics and Fostering of Researchers in Future Generations and the Global COE Program, Fostering Top Leaders in Mathematics–Broadening the Core and Exploring New Ground in the past. Currently, as the Mathematics Unit of the Kyoto University Top Global University Project "Japan Gateway Program", it provides the graduate students with an international research environment including teaching by top-class overseas researchers. These projects are jointly run by the Division of Mathematics and Mathematical Sciences in the Graduate School of Science and RIMS.

Number of Students

The numbers of students on the Department of Mathematical Sciences are as listed below.

Fiscal 2 Fiscal 2 Fiscal 2 Fiscal 2 Fiscal 2 Fiscal 2

Conferment of Degrees

The number of students in the Department of Mathematical Sciences who received a Ph.D. (in science) from Kyoto University (since 1994) is listed below.



Recently, graduate students in the Department of Mathematical Sciences have received the following prizes.

Fabruary 2012	SUZUKI Salia	Ath Kwata Universit
March 2012	ISUMOTO Varia	EV 2012 Verses Unit
Warch 2015	ISHIMOTO, Kenta	F I 2013 Kyoto Uni
September 2014	ISHIMOTO, Kenta	Fiscal 2013 Award
		Professor Yamada w
December 2015	ISHIDA, Yawara	CANDAR 2015 G

Career after Completing Graduate School Program

Most students work as researchers at universities and companies. Career after Graduate School Master's Program (Fiscal 1995 to 2016) Other schools 3 Civil servants 5 Civil servants 5 Companies/research institutes 33 Continuing studies 79

Year	Master's Program	Doctoral Program
013	18	17
014	21	17
015	21	17
016	19	21
017	20	23

As of April 1 for all fiscal years

ral Course	Doctoral Dissertation	Total
114	51	165
		As of April 1, 2017

y Tachibana Award for Outstanding Woman Researchers versity President's Award

for Outstanding Paper in Fluid Mechanics (jointly with while undertaking a doctoral course)

raph Golf Competition "Deepest Improvement Award"



Library

As a special library, the institute library collects and organizes literature and materials in the fields of mathematics, applied mathematics, computer science, and theoretical physics, and provides services not only to the staff and researchers of Kyoto University, but also to researchers of mathematical science all over Japan. Especially, the library serves as the center of joint usage/joint research, and is actively used by the participants of center activities. It is also endeavoring to enrich its stock of electronic books and journals.

The collected materials are in the reading room on the 3rd floor and the storeroom in the basement. They can be searched using KULINE (Kyoto University Library Online Catalogue). On a terminal in the reading room on the 3rd floor, domestic and overseas academic articles can be retrieved and used by accessing the database and electronic journals.

Library Web Site

http://www.kurims.kyoto-u.ac.jp/~library/Home.html

Number of Books			
Foreign books	95,034	Foreign journals	1,46
Japanese books	7,841	Japanese journals	13
	Total: 102,875		Total: 1,59
			As of April 1.





Publications

In addition to the research results of the full-time researchers, Publications of RIMS, which has been issued every year since 1965, is a journal for releasing important results concerning mathematical science in English. Papers that were published five years or more ago are freely available on the Web site of the European Mathematical Society. Some of those papers are also available on J-STAGE of the Japan Science and Technology Agency and the Web site of RIMS. RIMS Preprint, which releases the results of research by the full-time researchers before printing and publishing, is publicized on the Web site of RIMS. About 30 issues are released every year. In addition, as the records for lectures concerning joint usage research, around 50 to 60 issues of RIMS Kôkyûroku are released every year. For the records of the workshops specially selected by the Advisory Board, RIMS Kôkyûroku Bessatsu is issued. Papers having no copyright problems are publicized on the Web site of RIMS and the research information repository of Kyoto University. RIMS Kôkyûroku Bessatsu has been published successively since April 2009.

- European Mathematical Society http://www.ems-ph.org/journals/journal.php?jrn=PRIMS
- Electronic archive site of the Japan Science and Technology Agency https://www.jstage.jst.go.jp/browse/kyotoms1969
- National Institute of Informatics http://www.nii.ac.jp/sparc/partners/#7

RIMS

http://www.kurims.kyoto-u.ac.jp/~prims/index.html http://www.kurims.kyoto-u.ac.jp/preprint/index.html http://www.kurims.kyoto-u.ac.jp/~kyodo/kokyuroku/kokyuroku.html

Kyoto University Research Information Repository http://hdl.handle.net/2433/24849

Publications

The latest issue is vol. 53, N
The latest issue is No. 59.
The latest issue is No. 2018
The latest issue is No. 1870.



No. 1.

. (Only electronic version has been issued since August 2013.) As of April 1, 2017

Introductory Public Lecture

Introductory Public Lecture has been held almost every summer since 1976, featuring around three topics based on the results of mathematical science research selected from various aspects.

		Торіс	
Fiscal 2011	33rd	 (1) Irregular singular points of a differential equation (2) Markov chain and mixing time – Mathematics of card shuffling (3) Introduction to the resolution of singular points 	93
Fiscal 2012	34th	 (1) Infinite symmetry (2) Rigidity of graphs and matroids (3) Two-dimensional geometric group theory common to number fields and topological surface 	86 es
Fiscal 2013	35th	(1) Untyped lambda calculus and models(2) Mathematics of crushed ice(3) Morse theory and Floer theory	85
Fiscal 2014	36th	 Reconstruction of the additive structure with multiplicative information Billiards to symplectic topology How to calculate more easily? – Design and analysis of algorithms 	108
Fiscal 2015	37th	 (1) Poincaré conjecture and rich flow (2) Mathematics of the planetary dynamo theory – Why stars and planets have their magnetic flow (3) Banach-Tarski paradox 	fields? 114
Fiscal 2016	38th	(1) Mathematics of knots(2) Semantics of programming languages and category theory(3) Solving differential equations	121
Fiscal 2017	39th	 (1) Prime number theorem and Riemann zeta function (2) Introduction to nonstandard analysis – Mathematics of hyperreal numbers and infinity (3) ADE generalization of quintuple product formulas – From the viewpoint of field theory 	110

Expenses of the Institute

						Unit	: 1 thousand yen
Management Expenses Grants	728,943	767,346	769,235	738,684	730,971	721,779	695,477
Breakdown: Labor costs	483,548	497,874	495,897	477,587	443,792	435,362	419,552
Article costs	245,395	269,472	273,338	261,097	287,179	286,417	275,925
Grants-in-Aid for Scientific Research	85,772	87,285	101,100	116,790	121,468	131,842	142,138
Grants for Creating Research and Education Bases (Global COE Program)	101,280	90,620	93,309	0	0	0	0
Grants for Creating Research and Education Bases (Grants for Excellent Graduate Schools)	0	0	5,050	8,320	0	0	0
Commissioned research/ commissioned projects	10,863	2,500	0	315	789	1,586	8,190
Collaborative research	0	0	0	3,033	12,482	3,936	2,032
Contributions	1,010	1,100	4,937	4,772	3,472	3,974	1,000
Total	927,868	948,851	973,631	871,914	869,182	863,117	848,837

* For the article costs, the university management expenses grants except for enhancing the function of national universities are charged.

The external funds include the indirect expenses. The Grants for Creating Research and Education Bases is the coordinate allocation to RIMS.

The Grants-in-Aid for Scientific Research and contributions are the amount received.

Map of North Campus



Research Institute for Mathematical Sciences, Kyoto University

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