Graduate School of Mathematics
Department of Mathematics, School of Science
NAGOYA UNIVERSITY
2014-2015

CONTENTS

The Cover Page: Ford Circles near $\sqrt{2}$

Ford circles let us visually understand the world of rational numbers. A Ford circle is a circle centered at $(\frac{p}{q}, \frac{1}{2q^2})$ with radius $\frac{1}{2q^2}$, where $\frac{p}{q}$ is an irreducible fraction. Each Ford circle is tangent to the horizontal axis and no two circles intersect with each other. In fact, one can fit all Ford circles beautifully in the upper half plane. The cover page shows the Ford circles corresponding to those rational numbers near $\sqrt{2}$. In particular, the boldercolored circles represent the first few terms of the sequence $1, 1+\frac{1}{2} = \frac{3}{2}, 1+\frac{1}{2+\frac{1}{2}} = \frac{7}{5}$, $1+\frac{1}{2+\frac{1}{2+\frac{1}{2}}} = \frac{17}{12}, \ldots$, which converges to $\sqrt{2}$ as the following continued fraction expansion of $\sqrt{2}$ shows:

$$\sqrt{2} = 1 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2 + \cdots}}}$$

The figure suggests how quickly this sequence converges to $\sqrt{2}$. As this example shows, with the aid of Ford circles, theories involving rational numbers and continued fractions can be understood from a geometric aspect.

Enjoy your journey into mathematics!

To those who take up this brochure

Dean of Graduate School of Mathematics
KANNO, Hiroaki

Study and research of mathematics are often compared to mountain climbing. This is because the experience of piling up logical steps to reach our goals or obtaining surprisingly new prospects by finding unknown routes, viewpoints and concepts is similar to the experience of mountain climbing. The mathematics you have learned in high school and undergraduate programs is like climbing well-known mountains with a passage leading up to the start point of a mountain trail and a nicely paved path. But in a graduate program, you often face punishing paths and untrampled routes. I do not necessarily mean forbidding lofty mountain as in the Himalayas. Even in familiar mountains nearby, there might be secret routes and hidden lookout points. It is also appealing to aim at mountains spreading over from mathematics to other academic fields. In recent years, many mountains crossing over the boundaries of mathematics have been discovered, ever expanding the research field of mathematics. If you are considering studying and researching mathematics in graduate school, please contemplate which mountain you would like to climb. I hope that the information on our faculty members provided in this brochure will assist you in doing this.

In mountain climbing, the higher your goals are, the greater the need is to develop physical strength and to gather background information. Even if you are planning to climb a familiar mountain, to avoid accidents, it is always important to check the weather forecast and to make prudent judgments. Just as in mountain climbing, learning and researching mathematics require considerable preparation and determination. As this brochure carefully explains, it is our belief that our graduate program provides sufficient support systems for you to study and research mathematics. Our basic policy in educational programs stresses fundamental knowledge of mathematics and broad coverage of various fields of it. Based upon this policy, we offer systematically organized courses, a wide variety of intensive courses, and a tutorial program under the supervision of advisors. We are also proud of our excellent library, secure computer network system, and friendly supporting staff. Furthermore, in recent years, we have been strengthening our career planning support.

Perhaps some of you might think that you can do mathematics alone. But to avoid becoming complacent, you should not neglect communicating with various people. I advice you to keep your intellectual curiosity, to ask questions when you are puzzled, and to try to explain to others when you discover something or solve interesting problems. In these days, gathering information has become simple due to the development of the Internet. Yet, it cannot replace face-to-face communication with people from other academic disciplines or from different cultural backgrounds. We provide various opportunities for interaction such as Cafe David* and many events for international students. I encourage you to seize these opportunities.

One of the biggest goals for a graduate student in mathematics is to submit a masters' thesis or doctoral thesis and have it approved by the thesis committee. It can be compared to writing a useful guidebook on a mountain you have investigated and making people interested in that mountain. I would like to invite you to find your favorite mountain and tell others its charm. We, the members of the Graduate School of Mathematics, will gladly help you in that endeavor.

footnote
*) a common office hour in our graduate school (see page 11).

Introduction of Teaching Faculty

Keyword

Integrable model, Conformal field theory

My current subject is the quantum field theory with infinite-dimensional symmetry such as Virasoro algebra, for example, the string theory, conformal field theory and two-dimensional integrable model.

AWATA, Hidetoshi

Keyword

Programming languages, Type theory

I am studying the theory underlying functional programming languages. For more than 15 years, I have been working at fitting types onto the world, but the job is far from finished.

GARRIGUE, Jacques

Keyword

Graph colorings and labelings, Traversability in graph, Connectivity in graph

In the area of graph theory, my research interests include studying graph structures through graph colorings / labelings and distances in graphs. One of my current topics is to study traversability in graphs using various covering walks.

FUJIE-OKAMOTO, Futaba

Keyword

Algebraic K-theory, Motivic cohomology, Higher Chow groups

I work on algebraic K-theory and motivic invariants of varieties, and their applications to arithemetic algebraic geometry. This includes class field theory of schemes, the Tate-Beilinson conjectures, and the Beilinson-Soule vanishing conjecture.

GEISSER, Thomas

Keyword

Number theory, Arithmetic geometry, Non-commutative class field theory

I am trying to understand a very primitive but basic object "integers" via the modern aspects such as automorphic forms and Shimura varieties (non-commutative class field theory). Algebraic and geometric methods (including cohomology theory) are mainly used in my approach.

FUJIWARA, Kazuhiro

Keyword

Representation theory, Algebraic group

I am working to formulate "(unknown) invariant theory" which should associate to infinite dimensional representations, mainly using algebraic analysis, algebraic geometry, and representation theory.

GYOJA, Akihiko

Keyword

Number theory, Arithmetic geometry, Motivic fundamental group

I am working on (p-adic) periods and (p-adic) differential equations associated with motivic fundamental groups. I am also working on structures on special types of quantum groups associated with the KZ-equations.

FURUSHO, Hidekazu

Keyword

Mathematical physics, Elementary particle physics, Noncommutative solitons

I am interested in mathematical structure behind law of nature, especially, elementary particle physics and string theory. Now I study noncommutative solitons and integrable systems related to N=2 string theory and twistor theory.

HAMANAKA, Masashi

HAYASHI, Masahito

Keyword

Quantum information, Information theory

In order to ravel the mistery of quantum theory, I have studied quantum information theory based on the information theoretical aspect. My study treats this topic from the view points of information theory and representation theory.

INAHAMA, Yuzuru

Keyword

Stochastic analysis

The solutions of stochastic differential equations (SDEs) are most important examples among stochastic processes. I study these processes by using rough path theory, which is a generalization of SDE theory.

HAYASHI, Takahiro

Keyword

Quantum group, Hopf algebra, Tensor category

The field I am working in is quantum groups and their representations. In particular I am interested in generalized quantum groups and their relations to other area of mathematics, such as classical representation theory and integrable systems.

ISHI, Hideyuki

Keyword

Homogeneous space, Unitary representation

I study geometry and analysis on a manifold whose symmetry is not so small but not so large. I am interested in how a 'strain' of the manifold is reflected on function spaces over the manifold.

HESSELHOLT, Lars

Keyword

Homotopy theory, Algebraic K-theory,p-adic arithmetic geometry

My research focuses on the study of automorphisms of high dimensional manifolds through homotopy theory, algebraic K-theory, and topological cyclic homology. In this investigation, invariants and constructions in p-adic arithmetic geometry naturally appear.

ITO, Kentaro

Keyword

Hyperbolic geometry, Kleinian groups

My research interest is the theory of Kleinian groups. In this area, hyperbolic geometry, Riemann surfaces and low-dimensional topology are closely related each other. I am studying deformation spaces of Kleinian groups, which have fractal boundaries.

HISHIDA, Toshiaki

Keyword

Partial differential equations, Navier-Stokes flow

Interests are focussed on the existence, uniqueness, regularity, stability and asymptotic behavior of the Navier-Stokes flow in several unbounded domains. Functional- and real-analytic methods are often employed.

ITO, Yukari

Keyword

Crepant resolution, Quotient singularity, McKay correspondence

I am studying quotient singularities by finite groups. I am interested in the geometric and algebraic structure of them and their correspondences. They are also related with the super string theory in physics.

IYAMA, Osamu

Keyword

Representation theory, Auslander-Reiten theory, Derived category, Cluster theory

The theory of categorical structure of modules over associative algebras was initiated by Auslander, Gabriel, Ringel and others. This active research area has a strong impact on other fields of mathematics and physics, and requires fresh ideas from young students.

KAWAMURA, Tomomi

Keyword

Knot theory, Topology

I mainly research the relations between diagrams and invariants of knots and links. It is amazing that a lot of formulas are proved using advanced theories, though some of them seem to be very easy.

KANNO, Hiroaki

Keyword

Quantum field theory, Supersymmetric gauge, String theory, Integrable system

I am working on quantum geometry underlying the web of dualities among supersymmetric gauge/string theories. Representation theory and integrable systems are powerful tools for the investigation of quantum invariants in such a geometry.

KIMURA, Yoshifumi

Keyword

Fluid mechanics, Vortex motion, Turbulence

My research specialty is theoretical and computational fluid mechanics. I am interested in studying various mathematical aspects of flow problems.
In particular, I am concerned with the nonlinear dynamics of vortices and waves in flows including turbulence.

KATO, Jun

Keyword

Nonlinear partial differential equations, Fourier analysis

My research field is nonlinear partial differential equations relevant to the wave propagation phenomena, and related topics. I have been studying the solvability of such equations by using functional analysis, Fourier analysis, etc.

KOBAYASHI, Ryoichi

Keyword

Diophantine geometry

Diophantine geometry of minimal surfaces is a new reserach area which combines two classical subjects. A mysterious geometry emerges from this coupling, in which I am recently most interested in.

KAWAHIRA, Tomoki

Keyword

Complex dynamics

Complex dynamics, the theory of dynamical systems in complex variables, is the field I work in. I am mainly interested in rigidity and instability of such systems.

KONDO, Shigeyuki

Keyword

Algebraic Geometry, Moduli, Automorphic Forms

I'm studying geometry of the moduli spaces of some varieties by applying the theory of periods of K3 surfaces and Borcherds theory on automorphic forms.

KUBO, Masashi

Keyword

Source coding, Channel coding

My research field is the information theory. They includes many topics, and I study especially source coding and channel coding. Those topics treat of rate of data compression and channel capacity respectively. They are based on the theory of stochastic processes.

MORIYOSHI, Hitoshi

Keyword

Noncommutative geometry, The Atiyah-Singer index theorem

Noncommutative Geometry is a new framework in Mathematics proposed by A. Connes. The Atiyah-Singer Index Theorem is a central theme in Noncommutative Geometry, which is my current research subject.

MATSUMOTO, Kohji

Keyword

Zeta-functions, L-functions

Studying distribution of values and analytic properties of various zeta and L-functions such as the Riemann zeta-function, automorphic L-functions, and multiple zeta-functions.

NAGAO, Taro

Keyword

Random matrices, Semiclassical theory

Random matrices are matrices with random number elements. Using the methods such as the semiclassical analysis, I multilaterally study random matrices from the viewpoints of the fundamental theory and various applications.

MINAMI, Kazuhiko

Keyword

Solvable lattice model, Statistical mechanics, Quantum structure

I am mostly working in theories of quantum and statistical structure of lattice models. Within these areas one can work on problems involving solvable lattice models, its algebraic structures, critical phenomena and applications to magnetic materials

NAITO, Hisashi

Keyword

Differential geometry, Variational problem, Computer network system

My research subject are geometric variational problems and non-linear partial differential equations. Recently, I also research an authentication system of computer network.

MORIYAMA, Sanefumi

Keyword

String theory, Gauge theory, Mathematical physics

String theory is the most promising candidate for a unified description of all particle interactions. My research concerns the underlying beautiful mathematical structure of string theory and its physical implications.

NAKANISHI, Tomoki

Keyword

Quantum integrable systems, Quantum groups

I study (i) the integrable systems in quantum dynamics and field theories, (ii) the algebraic structures and their representation theories behind them such as quantum groups and Lie algebras, and (iii) the interplay of (i) and (ii).

NAYATANI, Shin

Keyword

Nonpositively curved metric spaces, Rigidity of discrete groups, Harmonic maps

I am interested in themes of differential geometry such as conformal geometry and geometry of nonpositively curved metric spaces. Recently I study rigidity of actions of discrete groups on such metric spaces using methods of harmonic maps, discrete geometry and random groups.

OKADA, Soichi

Keyword

Enumerative and algebraic combinatorics, Combinatorial representation theory

My research interests are in combinatorcs and its connection with other fields such as algebra, representation theory, and integrable systems.
More specific topics of interest are related to Young diagrams, symmetric functions, alternating sign matrices, classical groups, etc.

OHIRA, Toru

Keyword

Mathematical biology and physiology, Delayed stochastic systems

My interest lies in creating mathematical models of various physical, biological and social phenomena. Systems with feedbacks and interactions under the influence of noise / fluctuations and delays are of particular focus.

SAITO, Hiroshi

Keyword

Algebraic geometry, Algebraic cycle

My research interest is in algebraic geometry, especially in algebraic cycles such as normal cones as key ingredients of intersection theory in view of Chow bivariant intersection theory and related topological invariants such as vanishing cycles.

OHSAWA, Takeo

Keyword

L^2 extension theorem

There is a situation where the structure of an equation becomes simpler if one makes a transformation by introducing extra variables. The L^2 extension theorem due to Takegoshi and myself serves as an lemma in performing such a strategy.

SASAHARA, Yasuhiro

Keyword

Global analysis, Calculus of variations

I am studying variational problems which appear in geometry and mathematical physics. In particular, I'm interested in problems which do not result in solving differential equations.

OHTA, Hiroshi

Keyword

Symplectic geometry, Gauge theory, Floer theory

Recently, I am mainly studying two subjects: One is Floer cohomology theory in symplectic geometry based on certain homotopical algebra (so called A-algebra), and the other is to study some relationship between singularity theory and symplectic/ contact geometry.

SASAHIRA, Hirofumi

Keyword

Topology, Gauge theory

I study three and four dimensional topology using gauge theory. This theory has been developing with relations to various fields. For example, algebraic geometry, knot theory and physics. The geometry of three and four dimensions is very different from higher dimensions and interesting.

SATO, Takeshi

Keyword

Modular equation , π , Period

I study special functions (hypregeometirc functions, modular function e.t.c.), especially period relations and (iterative and series) approximations to π.

TAKAHASHI, Ryo

Keyword

Commutative algebra, Representation theory of algebras

I have been studying the boundary between commutative algebra and representation theory of algebras, that is, representation theory of commutative rings. The main purpose is to understand the structure of finitely generated modules over a commutative noetherian ring.

SHIROMIZU, Tetsuya

Keyword

General relativity, Cosmology, Differential geometry

My research interests are black hole spacetimes and cosmology based on general relativity(GR). Motivated by string theory, I am currently studying higher dimensional GR and anti-deSitter spacetime.

TAKATSU, Asuka

Keyword

Geometric analysis, Differential geometry

I study an isoperimetric problem which describes the relation between the volume and the perimater of a set by geometric approaches.

SUGIMOTO, Mitsuru

Keyword

Partial differential equations, Fourier analysis

I am studying various properties of solutions to partial differential equations by means of "estimates". Fourier analysis is the main tool, but it is also an important object of study in itself.

TANIGAWA, Yoshio

Keyword

Analytic number theory, Zeta-function

From the point of view of the modular relation, I am trying to generalize the functional equations of the zeta functions and to apply it to the study of arithmetical functions. I am also interested in multiple zeta functions.

SUZUKI, Hiroshi

Keyword

Algebraic number theory, Capitulation problem

When I calculate some groups, Hamiltonian graphs, Schur polynomials, etc., I feel that this is not a number theory, and I sometimes remember NaN.

TERASAWA, Yutaka

Keyword

Partial differenial equations, Fourier analysis, Fluid mechanics

I study incompressible Navier-Stokes equations and its generalizations, which describe various fluid phenomona. For the study of them, Fourier, functional and stochastic analysis are important and I am interested in their study too.

TSUGAWA, Kotaro

Keyword

Well-posedness, Fourier restriction norm, I-method

I have interests in partial differential equations. My current focus is on the study of the Cauchy problem of nonlinear dispersive equations by harmonic analysis.

YAMAGAMI, Shigeru

Keyword

Operator algebra, Tensor category

Main interests are mathematical structures, which have origins in quantum physics, such as representations of quantum algebras, quantum symmetries in operator algebras and quantum analysis in tensor categories. Related fields in functional analysis are also in the research range.

UZAWA, Tohru

Keyword

Group theory, Representation theory, Geometry

Representation theory deals with symmetries in vector spaces. It is an extremely active field, with connections with various fields, pure and applied.

YOSHIDA, Nobuo

Keyword

Probability theory, Statistical mechanics

There are strict laws which govern the "randomness". Attracted by this paradox, I have decided to specialize in probability theory. I am mainly interested in research subjects related to statistical physics.

Designated Associate Professor G30

Laurent Demonet

Research Fileds

cluster algebras and their categorifications
representation theory of associative algebras
category theory

PAPERS

L. Demonet: Categorification of skew-symmetrizable cluster algebras, Algebr. Represent. Theory 14 (2011), no. 6, 1087–1162.

L. Demonet: Skew group algebras of path algebras and preprojective algebras, J. Algebra 323 (2010), no. 4, 1052–1059.

L. Demonet: Cluster algebras and preprojective algebras: the non-simply laced case, C. R. Math. Acad. Sci. Paris 346 (2008), no. 7–8, 379–384.

Personal web

http://math.unicaen.fr/~demonet/index-en.htm

Anne-Katrin Herbig

Research Fileds

several complex variables

PAPERS

A.-K. Herbig: A sufficient condition for subellipticity of the dbar-Neumann operator, J. Funct. Anal., volume 242, 2007, 337–362.

J. E. Fornaess and A.-K. Herbig: A note on plurisubharmonic defining functions in $\mathbb{C}^n$, Math. Ann., 342 (2008), no. 4, 749–772.

A.-K. Herbig and J. D. McNeal: A smoothing property of the Bergman projection, Math. Ann., volume 354, 2012, 427–449.

Personal web

N/A

Serge Richard

Research Fileds

functional analysis
spectral and scattering theory
index theorems in scattering theory
Mourre theory
magnetic systems

PAPERS

S. Richard, R. Tiedra de Aldecoa : Time delay is a common feature of quantum scattering theory, J. Math. Anal. Appl. 387 (2012), 618 – 630.

J. Kellendonk, K. Pankrashkin, S. Richard : Levinson's theorem and higher degree traces for Aharonov-Bohm operators,J. Math. Phys. 52 (2011), 052102–1 – 052102–28.

M. Lein, M. Mantoiu, S. Richard : Magnetic pseudodifferential operators with coefficients in C*-algebras, Publ. RIMS, Kyoto Univ. 46 (2010), 755 – 788.

Personal web

http://math.univ-lyon1.fr/homes-www/richard/

Message from Teaching Faculty

IYAMA, Osamu

From the fjord country

When I got off a connecting flight to Trondheim from Copenhagen, I found my breath turning into a white smoke in the cold air. It reminded me that Norway had low temperatures even in August. I often travel to Trondheim, Norway's third largest city, for academic purposes, and this was my fifth visit. Having just attended a summer conference in Poland, I thought I already knew what the weather would be like in Norway. I should have brought along my warmer outfits! Thinking of what it would cost to buy an appropriate jacket here, I sighed deeply again turning the air into a smoky vapor.

After leaving the airport, I enjoyed the beauty of the Nidelva River on the way to the Norwegian University of Science and Technology (NTNU). I was looking forward to seeing a familiar face in a certain office on the eighth floor at the university. When I got to the office, my face was wreathed in smiles. Dr. Reiten and I were delighted with this reunion. She was waiting there with a spare sweater and scarf ready for me. What a wonderful person she is! It was a series of papers that Professor Idun Reiten wrote during the 1970s that inspired my own choice of research.

I am always relaxed when I chat with her in English, because she has never pounced on my grammar mistakes. I couldn't wait to tell her the latest results of my research. The details of the discoveries I had omitted in e-mails from Japan I found easy to articulate here, face-to-face. I am particularly grateful to her for showing genuine pleasure in my findings. Students come to NTNU from all over the world. I believe her presence helps to explain why.

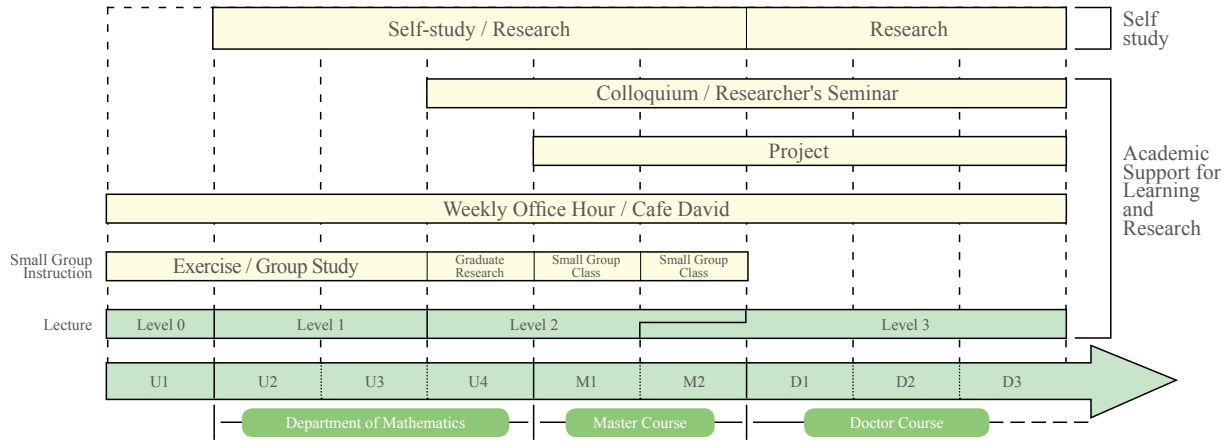
The main purpose of this particular visit was to complete the finial draft of a paper we had collaborated on. It required examining the contents minutely as the editing process neared its end. Even a slight change can make the entire article sound more sophisticated. We were also surprised to find a few conflicting statements. In the process of choosing the academic journals which to submit the paper, we spent days discussing its contents. This also entailed exchanging e-mails with a mathematician in the U.K., also a co-author. It took two busy weeks for us to complete the final draft.

I dined out with Professor Reiten the last day before my departure for Japan. We ate our usual fare, a famous fish soup. In the restaurant, I talked about topics my students in Japan are working on. She was cheerful, joking "Osamu, you were born in the very same year in which Almost Split Exact Sequence was discovered." A memorial was held celebrating the sixty-fifth birthday of this surprisingly energetic woman in May 2007. On the flight back to Japan, I found myself wondering how much further mathematics will advance while she is still a working scholar. I returned to Nagoya the following day to continue with my research, revitalized by the days in Norway.

Original Program
Fostering Creativity in Mathematics

Level System and Educational Program

Students can pursue a purpose-centered education suited to their area of inquiry and unfettered by their official school year.



Level System

The Level System is our central mechanism for classifying programs of study into educational purposes, organizing both undergraduate and graduate degree curriculums as a coherent whole. Thus, all lectures and small group classes fall into a certain level.

Level 0

All science major students work together in the initial disciplinary phase of the art of science level 0 classes and learn subjects including calculus and linear algebra.

Level 1

Level 1 classes deal with basic concepts, which all science-majored students need to comprehend. This level corresponds to curricula for undergraduates in the second and third years. These classes encourage students to apply and connect mathematical concepts with other fields of science, such as physics, and to develop intuitive, logical and abstract thinking.

Level 2

The scope of level 2 classes embraces various areas of advanced concepts. These classes provide scholarly training in logical, abstract and systematic approaches commonly used in mathematics through a wide diversity of subjects. This level is intended for fourth year undergraduates and graduate students. It is advisable to complete the set of classes within two years.

Level 3

Level 3 classes serve as advanced courses, and are designed based upon the elemental portions of the curriculum up to level 2, the so-called core program. These are intended for all 2nd year or above graduate students and should be completed over three or four years.

Basic Principles

Emphasis on Basic Skills and Broad Minds

The Department of Mathematics and the Graduate School of Mathematics aim to cultivate self-motivated individuals, who can successfully navigate inquiry, reflection, and discovery based upon scholarly training in mathematics. Our commitment is to maintaining an enlightening environment for problem-conscious students where, together with scholars and fellow students, they can refine their ideas and apply logical reasoning in seeking solutions to problems.
Prospective students should know that in the mathematics department:

- Research planning, pursuit of research and regular reporting of results are expected.
- The education in the department is designed to support students' self-motivation.
- Research is pursued in dialogue with active researchers and fellow students.

Emphasis on Independent Will

The aim of the doctoral program is to foster researchers with multiple talents in mathematical sciences who are also capable of working in various fields. In the Graduate School of Mathematics we offer doctoral students an active and global work place in order that students enrich their knowledge by working together with younger researchers.
Mathematical scientists are not only those who work in a university or a laboratory but include those competent to solve problems of any field of the mathematical sciences. Therefore, we encourage you to take a broad perspective in considering your career options after graduation.

Cafe David

Learning Mathematics at "Cafe David"

The idea of studying mathematics brings images to mind of large lecture halls and rigorous self-study. These traditional methods of study are indeed important, but there are also dynamic alternatives.
One of those is to gather various thinkers together to debate and discuss mathematics. The photo is of our own weekly event, "Cafe David". Here, undergraduate students, graduate students, and teaching faculty gather in a casual cafe meeting style, to chat over both academic and less formal questions.
The well known mathematician often said to represent the 20th century David Hilbert is whom we have named our "Cafe David" after. As the name suggests, delicious coffee is on offer for department members in attendance. Discussions here allow many to overcome common barriers that exist between undergraduate and graduate students, or between students and faculty, or among academic areas or schools, strengthening relationships and intellectual understanding at the same time. In addition, graduate students join "Cafe David" as teaching assistants, offering a comfortable environment to answer tough questions from lectures. Faculty provide assistance here in the form of office hours and students can learn from interaction in this active public learning space.
Wouldn't you like to come and take a look at our diverse learning styles of mathematics?

Undergraduate Program

Learning and Lecture Content

The following is a brief description of what is offered at Nagoya University for mathematics majors.

Level 0 (Freshmen)

You will learn differential calculus and linear algebra through examples and by working on exercises. These are the "raw material" of modern mathematics. You will be asked to carry out explicit computations, which will give you access to computational skill, and will foster proper intuition for mathematical concepts. It is of utmost importance that you work through as many problems as possible, gaining exposure to mathematics.

Semester	Lecture	Small Group Class
Summer	Calculus of one variable/ Linear algebra/ Overview of mathematics	Seminar on mathematics
Winter	Calculus of several variables/ Linear algebra/ Overview of mathematics	Seminar on mathematics

Level 1 (Sophomore)

First differential calculus and linear algebra will be reworked rigorously in the language of modern mathematics –sets and maps. Totally new concepts, such as complex function theory and topological spaces will enter the scene. The learning curve is steep, and you will be required to put in a lot of effort and your patience will be taxed, but the reward will be high: an entrance ticket to modern mathematics.

Semester	Lecture	Small Group Class
Summer	Sets and mappings/ Linear space and linear mappings/ Calculus of one variable	Seminar on mathematics
Winter	Calculus of several variables/ Topological spaces/ Complex function theory Normal forms of matrices/ Introduction to information sciences	Seminar on mathematics

Message from Foreign Student

Junghun Lee

Self-introduction
My name is Junghun Lee. I come from South Korea. I have been living in Japan since 2008 when I was an undergraduate student. Now I am a graduate student of mathematics of Nagoya University.

Daily Life
Here let me share a bit about my daily activities. I shall divide it into two parts, study and part-time work activities.

Part-time Work
I am working as a research assistant at Nagoya University. The contents of the part-time work consist of taking some lectures, and writing feedback about each of them to improve those lectures. For example, sometimes we take IELTS preparation class, participate in some kind of discussion, and take a lecture to be a global leader.

Nagoya
The location of Nagoya is in the middle of Japan. It is very convenient to go to other places in Japan. Indeed, many graduate students need to either attend or to participate in many conferences, and they are held in many different places, such as Tokyo, Kyoto, or Osaka. I think it is one of the merits that Nagoya is located in the middle of Japan.
Moreover, there are many dormitories available for international students in Nagoya. I am living in Nagoya International Student Center for 4 years. The staffs are very kind and helpful to me. It is quite far from Nagoya University, but I enjoy riding a bicycle to commute. Don't worry, if you want to live around Nagoya University, you can also choose dormitories nearer to the university than mine.

Nagoya University
Nagoya University has a very good environment for studying mathematics. First of all, there are a lot of teachers in various fields such as Mathematical Physics, Algebra, Geometry, Analysis, etc. Every year, they open some classes related to their fields called `Sotsugyou Kenkyuu' and `Syouninzuu Class'. Each of these is a kind of seminar where the students give presentation one by one and the teacher listens and also gives advices during the seminar. If you want to join this class, you may ask for a permission to join to the teacher in charge. Secondly, there are many books and articles in the library of Nagoya University. It is very helpful because we need many references to study mathematics. The library has many references, so we don`t need to buy all of what we need.
Finally, I would like to talk about the staffs. The staffs here are so kind and they help you as long as they can. Everyone can be a friend to the staffs. They have many events for international students so that we can enjoy our campus life. Besides, they are really professional in dealing with your problems such as finding financial supports, working as a teaching assistant or research assistant, looking for dormitory, etc.

Level 1 (Junior)

You will be introduced to mathematics that was developed in the early 20th century. Level 1 ends with the introduction of the Lesbesgue integrals and its application to Fourier analysis, curves and surfaces which generalize circles and spheres, groups and rings that are algebraic abstraction of numbers, polynomials and maps. There will be "Omnibus lectures" on how mathematics relates to the real world, and what lies ahead of all this, "group study" where you pick the text of your choice, discuss the content with your fellow students, give talks, and give a poster presentation.

Semester	Lecture	Small Group Class
Summer	Introduction to group theory/ Introduction to curves and surfaces Introduction to differential equations/ Lebesgue integrals and measure theory	Seminar on mathematics
Winter	Rings and polynomials/ Introduction to differential forms Introduction to functional analysis/ Omnibus lectures/ Group study	Group study

Level 2 (Senior)

Lectures for seniors at Level 2 are all open to seniors and graduate students. The subject matter of these lectures differ by year. A partial list of courses offered in the past is given below. There are also numerous "intensive courses" , which typically last for a week, designed to give an overview of research at the forefront. Courses at this level emphasizes the diversity and universality of mathematics that can only be appreciated by taking a higher viewpoint. You are not only expected to learn from these courses, but also to develop your own viewpoint/taste for mathematics. Reading courses under faculty supervision are offered, where you will learn how to read a book or a research article, how to formulate your thoughts in a mathematical way, and how to discuss mathematics.

Semester	Lecture	Small Group Class
Summer	Fields and Galois theory/ Manifolds/ Functional analysis/ Introduction to probability theory/ Introduction to mechanics/ Introduction to numerical analysis/ Omnibus lectures	Senior reading course
Winter	Elliptic curves/ The heat kernel and the index theorem/ Introduction to partial differential equations/ Electromagnetic theory/ Methods in applied mathematics (offered in English)/ Functional programming languages	

Graduate Program for Master's Degree

Fostering Scholars who Investigate, Think and Discover on their Own

The Graduate School of Mathematics aims to cultivate self-motivated individuals, who can successfully navigate inquiry, reflection, and discovery based upon scholarly training in mathematics. Our commitment is to maintaining an enlightening environment for problem-conscious students where, together with scholars and fellow students, they can refine their ideas and apply logical reasoning in seeking solutions to problems.

Intensive Courses

Intensive courses are those conducted by lecturers from other universities or institutions, intensively, over short periods of time. Content ranges widely from those of an introductory nature, that require no prior technical knowledge at all, to those that focus more narrowly on the most cutting edge findings in a specific field. Not only are the mathematical fields of Algebra, Geometry, Analysis to Applied Mathematics and Mathematical Physics covered, but lecturers are brought in to offer various perspectives, including that of the corporate world and practical applications. To find out more information about intensive lectures and the small group classes explained below, please see our graduate school's web page.

Small Group Class

Small Group Class is a two-semester seminar intended to develop reading, critical thinking and discussion skills. In the seminar class students expand upon their learning from faculty lectures and identify their specific focus of interest/ research from within areas presented in lectures. Within the chosen subject area, classes offer multifaceted lectures guided by student interest. The pace of the lectures is tailored to participating students' needs. As seen from the chart above, students can both improve their skills and explore their chosen field in the small group class. Master's students will belong to a credit-earning seminar each year. At the same time they are strongly advised to attend another seminar. Students who attend regularly and submit successful assignments will be awarded at most 1 credit over 2 years in addition to the credits from other classes for which they are registered.

Teaching Assistants (TA)

Teaching assistant positions are filled primarily by first year master's students. They are hired to aid professors with lectures and seminars for undergraduate students of first, second, and third year in the science department, as well as others, and to assist with Cafe David. Duties of a TA include designing and correcting class exercises, writing interpretations, and attending to all Q & A in and out of class. These duties offer graduate students an opportunity to join the backstage of university lectures. Experiencing lectures from the standpoint of a teacher allows TAs an invaluable opportunity for their future, to learn now what it is to teach. In addition, as TA, one can understand many of the typical problems that students repeat, as well as those of beginning instructors and how to avoid them. Wages are paid to TAs, but many past TAs say that the real value in this assistant position is the opportunity to enhance one's own learning and future research.

Message from Foreign Student — Ade Irma Suriajaya

My name is Ade Irma Suriajaya, but people usually call me Chacha in Japan. I come from Indonesia and now I am in my second year of master program in mathematics in Nagoya University. My field of study is analytic number theory and I am doing research on the zeros of the derivatives of the Riemann zeta function and the Dirichlet L function [under the supervision of Prof. Kohji Matsumoto].

I graduated from a university in China, and in my third year of undergraduate study, I got an opportunity for a student exchange program of Nagoya University. That was my first time coming to Japan and also the first time I learned Japanese.
At that time, my major was Aeronautical Engineering, but since I was really interested in mathematics, I took mathematics classes besides Japanese during that period. In the first semester, since I could not understand Japanese, I took a mathematics class which was given in English. In the second semester, I took some classes in mathematics which were given in Japanese. I was really impressed that the teachers I knew during that period taught me who understood nothing about pure mathematics, very kindly and sincerely. Even when I could not understand Japanese, they all explained well in English, and sometimes even let me ask in English when I could not express my question in Japanese. There is also a space in the building where you can ask any questions related to mathematics. There are some teachers and students there to help you, and it is open everyday during the lunch break. I went there very often, and I found it really helpful for my study. To be honest, the atmosphere around helped and encouraged me so much to master Japanese that I became more and more impressed.

I really felt in love to the study and research environment in the Graduate School of Mathematics of Nagoya University and, of course, to the environment of Nagoya itself. Thanks to the exchange program, not only for giving me the chance to study Japanese, but also for giving me a chance to know this place which attracted me so much that I finally decided to change my major to mathematics and also to return to the Graduate School of Mathematics of Nagoya University after my graduation in China. That is the reason why I am here right now. Here they have good facilities, such as the study space given to each graduate student, the seminar rooms, and especially the library. They also have good services and they provide various kinds of financial supports. Besides scholarship for international students, they also employ students as teaching assistants and research assistants. Here every student is also provided with some research allowance which we can use to attend a symposium, conference, seminar, etc. either inside or outside Japan. There are still some other financial supports also. Nagoya University itself provides Japanese courses and also some other foreign language courses open to not only exchange students or any particular students, but, as I know, all students. These are some few reasons why I do not regret my decision to return here.

People say it is not easy to adapt to new environment, and it is also the same about major. I faced difficulties the first time I came to Japan and I found it really hard to be able to pace up with my peers since I lacked of understanding in basic (pure) mathematics. Especially, students of mathematics in Japan are required to do seminars since they were in their undergraduate studies. I did not do well in the beginning and there were so many things which were hard be understood. But many students, including seniors, and teachers around who understood and helped me along the way. I believe that it also happened to the other students as well.

Graduate Program for Doctoral Degree (Ph. D.)

Fostering the Next Generation of Young Scholars

The primary goal of our doctor course is to foster the next generation of young mathematicians. To understand the necessary broad range of skills involved in mathematical sciences and be prepared to apply them appropriately to various problems. The doctoral course in particular requires self-driven learning, including discovering problems on one's own and building the skills necessary to solve them. Sending our PhD holders equipped with these skills as competitive professionals out into society is the ultimate goal.

Active Student Body

Our current doctoral students are involved in student organized seminars on campus, as well as the planning and organizing of national academic conferences for young scholars. This is in addition to active independent research of their own.
We believe this combination of activities results in the high quality research output our department's doctoral students produce. Among other activities, Student Project receives strong support from our department, as well as from the Program for Enhancing Systematic Education in Graduate Schools since 2007.

Student Project Titles of 2013

1	Mean Curvature Flow on Lagrangian Submanifolds
2	Topological Methods in Arithmetic Geometry
3	Categorification Summer School
4	Crossover KLR
5	Peripheries of Constructive Mathematics
6	Generalized Index Problems Using K-groups of Operator Algebras
7	World of Zeta Functions
8	The Bergman Kernel and its Applications to Geometry
9	Study on Singularities of Positive Characteristic and Numerical Invariants
10	Study on Elliptic Equations and Geometry
11	General Study of Arithmetic Fields
12	Well-Posedness of Nonlinear Dispersive Equations and Asymptotic Behavior of Their Solutions
13	Multiple Zeta Functions and Their Peripheries
14	Asymptotically Anti-de Sitter Spaces and the Theory of Relativity
15	Young Mathematicians Workshop on Several Complex Variables 2013
16	Research about Cluster Categories and Triangulations of Surfaces

RA (Research Assistant)

Many doctoral students may be employed as research assistants (RA) to help them develop their research skills and to provide opportunities for participation in various research groups in the Graduate School of Mathematics. The RA system has been financially supported by the Program for Enhancing Systematic Education in Graduate Schools since 2007.
Grants-in-Aid for Scientific Research also helps to support doctoral students as research students. There were 15 RAs in 2007, 14 in 2008, 12 in 2009, 9 in 2010, 12 in 2011, and 16 in 2012, 78 in total.

JSPS Fellows

This program was established by JSPS (Japan Society for the Promotion of Science) to assist promising and highly qualified students wishing to conduct research in universities or institutions. Fellowships are awarded for a period of two to three years with monthly research-related expenses and Grants-in-Aid for Scientific Research. Detailed information is provided at: http://www.jsps.go.jp/english/index.html

Interdisciplinary Research

Mathematics has historically influenced other fields, and at the same time evolved itself, from the influence of other research fields. Nowadays, working towards a goal of broad global exchange is not enough. Conducting research with a vision beyond our own narrow fields is also required. Our department makes a unique effort to strive towards working with scholars of interdisciplinary research, and also with the Graduate School of Information Science, in order to further this goal.

Message from Foreign Student

Gustavo Jasso Ahuja

I was born and raised in Mexico, where I got an undergraduate and a master's degree in Mathematics. Coming to Nagoya to pursue a Ph.D. has proven to be wise decision since the very beginning.
I am a member of a multicultural and very active research group, lead by Prof. Osamu Iyama, with several visitors coming from within and outside Japan each semester. Postdoctoral researchers have played an important role in my development as they are generally available for discussions and happy to answer random mathematical questions. Moreover, I have had the opportunity to attend several conferences each year, in Japan and in other countries. These conferences have given me not only the chance to learn mathematics, but also to learn about the culture of the places I have visited. All of this, combined with the free culture of the university, provides an ideal environment to develop myself as a researcher. Also, the staff at the department is always prompt to solve any problems or questions students may have in the university.
On a more personal note, life in Nagoya is quite enjoyable. While Nagoya is not famous for its tourist attractions, as an industrial city it has everything one would expect to find in a major city. Also, Nagoya is sufficiently close to Tokyo and the Osaka-Kobe-Kyoto metropolitan area which allows for visits during the holidays.
Overall, I can say that I have found the research atmosphere in Japan and particularly in Nagoya University very welcoming, and thus can say that coming here is something one can hardly regret.

Tuition and Other Information

Tuition and Other Fees (as of April, 2013)

Student Status	Application (¥)	Registration (¥)	Tuition (¥)
Degree-Seeking Student (undergraduate)	17,000	282,000	535,800 per year
Degree-Seeking Student (graduate)	30,000	282,000	535,800 per year
Research Student, Graduate School Research Student	9,800	84,600	29,700 per month
Special Audit Student, Graduate School Special Audit Student	–	–	14,800 per credit
Special Research Student	–	–	29,700 per month
Traning Course in Japanese	9,800	43,500	30,200 per month
Training Course in Japanese Lang. & Culture	9,800	84,600	29,700 per month

from HANDBOOK for International Students 2011-2013, Nagoya University

Fee Exemptions

Independently-financed degree-seeking students, who demonstrate excellent academic records and are in need of financial assistance, are eligible to be considered for exemptions from half or the entire tuition. However, as the possibility of obtaining an exemption is small, it is advisable to prepare to pay the necessary fees. The application process for fee exemptions takes place each semester. Applications for the spring semester are generally accepted from the end of February to March, and for the fall semester, from the end of August to the middle of September. Please pay close attention to these deadlines. Students should contact the office of their school for further information.

Scholarships

For information on the scholarships provided by The Japan Student Service Organization (JASSO), please visit the website: http: //nupace.ecis.nagoya-u.ac.jp/en/life/jasso.html

As of May 2012, Nagoya University is currently home to 1,611 international students, 77.5% of them independently financed. A variety of financial support is available to these students. Information about scholarships is posted on the school bulletin board. Students are advised to check the boards daily.

Japanese Language Programs

The Education Center for International Students, Nagoya University offers the following Japanese language courses.

1. University-Wide Japanese Language Programs

(1) Standard Courses in Japanese/ Intensive Courses in Japanese
(2) Online Japanese Courses
(3) Kanji Course
(4) Introductory Lectures in Japanese Studies

2. Special Japanese Programs

ECIS offers four types of Special Japanese Programs. Enrollment in these courses is limited.
(1) Intensive Program in Elementary Japanese
(2) Intensive Program in Advanced Japanese
(3) Japanese Language Classes for International Undergraduate Students
(4) Introductory Program for Korean Engineering Students

Advising & Counseling Services (ACS)

http://www.isa.provost.nagoya-u.ac.jp/en/

ECIS (ACS Office) is a university-wide office to assist international students with issues or problems they may have. We provide information and advices to international students about academic and personal matters, as well as cross-cultural adjustment and psychological issues. If you have any difficulties or concerns while you are in Japan, please feel free to contact us. We will keep our discussions confidential.

Office Hours and Staff (from Advising & Counseling Services, Nagoya University)

Advisor	Ms. Kyoko TANAKA / International Student Advisor/ Director (Professor)				
Office	Room742 West Wing, IB Building				
Office Hours	Mon	Tue	Wed	Thu	Fri
10:00-12:00	O	-	O	O	-
13:00-16:00	O	O	O	O	-

Advisor	Ms. Hitomi TAKAKI / International Student Advisor (Associate Professor)				
Office	Room204 ECIS Building				
Office Hours	Mon	Tue	Wed	Thu	Fri
10:00-12:00	O	-	O	O	O
13:00-16:00	O	-	-	O	O

Advisor	Ms. Makiko TADOKORO / International Student Counselor (Associate Professor)				
Office	Room740 West Wing, IB Building				
Office Hours	Mon	Tue	Wed	Thu	Fri
10:00-12:00	O	O	O	O	O
13:00-16:00	O	O	-	O	O

Advisor	Ms. Naomi BANNO / International Student Counselor (Associate Professor)				
Office	Room738 West Wing, IB Building				
Office Hours	Mon	Tue	Wed	Thu	Fri
10:00-12:00	O	O	O	autumn only	O
13:00-16:00	O	O	O	autumn only	O

ACS Office

From Monday to Friday: 10:00-12:00, 13:00-16:00
TEL : 052-788-6117 E-mail : isa@ecis.nagoya-u.ac.jp
Room739 West Wing, IB Building

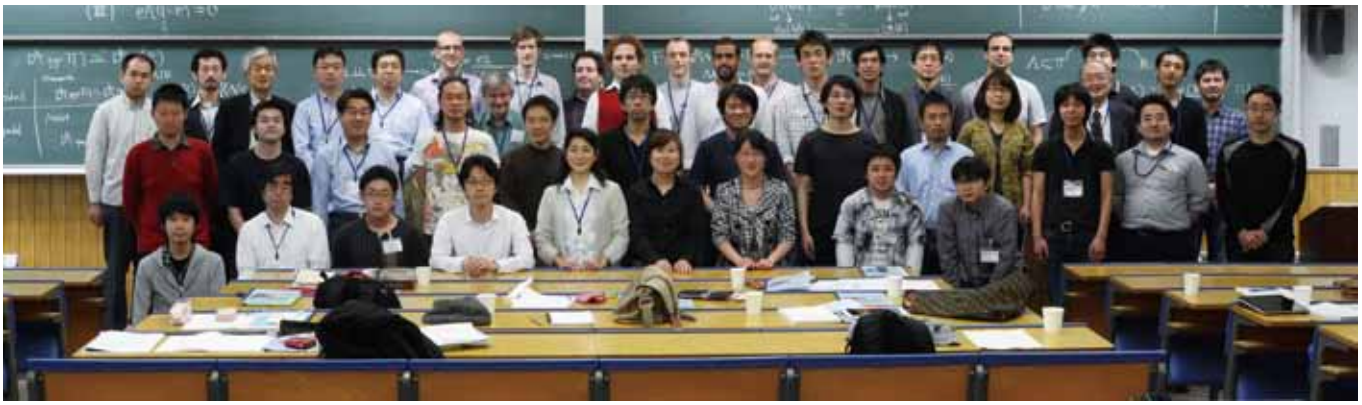
Career Paths after Graduation

	Undergraduate			Master's Course			Doctor's Course		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
Private Company	11	13	8	17	22	20	3	-	1
Researcher/ Faculty	-	-	-	-	-	-	4	6	4
High School Teacher	18	14	9	8	12	14	-	-	-
Civil Servant	1	1	3	1	3	2	-	-	-
Graduate School	24	25	22	18	7	15	-	-	-
Research Student	-	-	-	2	1	-	1	-	2
Others	7	4	3	9	5	8	2	-	2
	61	57	45	55	50	59	10	6	9

International Conference by Graduate School of Mathematics, Nagoya University

Conference on Resolution of Singularities and the McKay Correspondence 2012

The Nagoya International Mathematical Conference is a meeting held at Graduate School of Mathematics of Nagoya University every year since 2001. The title of the 2012 meeting was "Conference on Resolution of Singularities and the McKay Correspondence." While there were two small meetings on the McKay correspondence held here before, this conference in 2012 was much larger and there were a number of participants from different countries. The topics of the talks were releted to several fields such as algebraic geometry, ring theory, and representation theory. The participants enjoyed the fruitful talks and discussions as well as Japanese foods and culture. Many of them were the JSPS researchers before and they were also happy revisiting Japan.



Perspectives of Representation Theory of Algebras 2013

During November 11-15, 2013, our 13th annual International Nagoya Mathematical Conference titled "Perspectives of representation theory of algebras" was held on the occasion of 65th birthday of Professor Kunio Yamagata. We invited 10 main speakers who are distinguished founders of this area, and 10 plenary speakers who are working on related areas such as cluster algebras, quantum groups, commutative algebras, algebraic geometry and mathematical physics. There were also short presentations by young researchers. There are 88 conference participants from Germany, United States, England, Poland, Norway, China, Korea, Belgium and UAE, and this time, many young researchers including graduate students participates, too. At the conference, representation theories such as quivers, Frobenius algebras, cluster algebras, derived categories, Cohen-Macaulay modules, weighted projective lines were the central themes. Starting with the lecture by Professor I. Reiten entitled, "Lattice structure of torsion classes" and ending with Professor C. M. Ringel's lecture "The root posets", a heated discussion drew in broad participation and debate among the many in attendance.

Past Conferences

2011 (11th)	Topology and Analysis of Foliation	2006 (6th)	Representation Theory of Algebraic Groups and Quantum Groups'06
2010 (10th)	Representation Theory of Algebraic Groups and Quantum Groups'10	2005 (5th)	Geometric Quantization and Related Complex Geometry
2009 (9th)	Harmonic Analysis and Partial Differential Equations	2004 (4th)	Complex Geometry and String Theory
2008 (8th)	Combinatorics and Representation Theory	2003 (3rd)	Numbers, Symmetry and the Concept of Space -COE Opening Conference-
2007 (7th)	Spectral Analysis in Geometry and Number Theory	2002 (2nd)	Discrete Groups and Moduli
		2001 (1st)	Automorphic Forms and p-Adic Groups

The Global 30 Project - Bringing Nagoya University to the World

In July 2009, the selection results of the 2009 Project for Establishing Core Universities for Internationalization (Global 30) were announced, with Nagoya University standing out as one of the Global 30 leaders.

The objectives of Global 30 are to strengthen the international competitiveness of Japanese higher education and to offer an education with standards that appeal to foreign students while, through creating an environment where Japanese students work together with international students, fostering highly educated individuals who can be active internationally. The project comprehensively supports a plan to create universities that act as bases for internationalization by providing both the high level of education expected from universities and environments that make studying in Japan more accessible for overseas students.

To lead Japan's universities toward internationalization, Nagoya University must transform itself into a "university of the world". This means building a new environment in which Japanese and international students work side by side. In this way, the high standards of undergraduate and graduate education Nagoya University has achieved will be more widely accessible to students from overseas, and the University will be able to educate individuals with the ability to interact on the world stage.

For more information, see

http://admissions.g30.nagoya-u.ac.jp/en/index.php

Mathematics without Borders

Mathematics has no borders. No matter what nationality they are, mathematicians around the world strive each day through their research to progress the development of mathematics. Among them there are always researchers out there somewhere pursuing answers to the same problems. Therefore, it can be said that the exchange of information regarding research is extremely important. In order to exchange this up to date information our school works hard to promote and offer various conferences, intensive courses, seminars and workshops. In this vein, we established formal academic alliances with Korean Institute for Advanced Study (KIAS), Paris 7 Denis Diderot University, etc. With them we have conducted cooperative research workshops and the exchange of graduate students as research assistants.

Message from Recent Graduate — Yanyan Wang

Yanyan Wang, Major in complex analysis, Faculty of The Graduate School of Mathematics.

I went to Nagoya University of Japan for my doctoral degree after I had obtained my master's degree in China in October 2008. I had been dreading my trip because that was my first time to go abroad and I knew little Japanese at that time. I didn't know what would happen after I arrived in Japan. I embarked on my road with an apprehensive mood.

In fact, there was nothing to worry about. I had got much help from my professors, classmates and staff of the Graduate School of Mathematics. I do appreciate their help! I had a seminar once a week in the four years when I was there. It was challenging for me at the beginning. I still remember the first time when my professor asked a question and I couldn't answer. I felt so ashamed but the professor just gave me another question that was related to the first one, and gave me a few more until I had understood the original question better and how to answer it. I always remember the face and voice of the professor in these years. Even now, when I meet a difficulty in my research, I recall the moment and it helps me think about how to solve my problems.

The four years in Japan was a memorable experience. There are also many kinds of cultural activities involving international students, where I learned Japanese better and had a lot of fun.

Academic Cooperation Programs

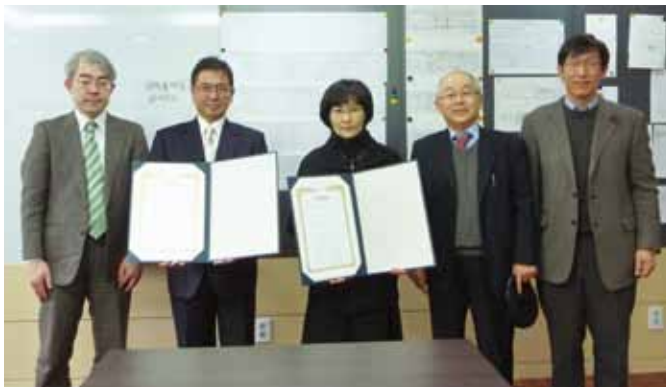
Our Graduate School has several academic exchange programs shared with worldwide institutions to promote and develop cooperation in the field of mathematical sciences through the following activities:

- Exchange of faculty and students.
- Exchange of publications and other academic materials.
- Bilateral symposia and workshops.
- Meetings to improve mutual research and educational programs.
- Mutual student managed projects.

Here is the list of institutions in cooperation agreement as of May 2012:

- Department of Mathematics, Nanjing University since 2012.
- Department of Mathematical Sciences, Seoul National University since 2012.
- Faculty of Mathematics, Ruhr Universität Bochum since 2011.
- Université Paris 7 - Denis Diderot since 2004.
- The Korean Institute for Advanced Study (KIAS) since 2004.

Signing Ceremony with Nanjing University
March 2, 2012



Signing Ceremony with Seoul National University
February 9, 2012

Mathematicians Shouldering Tradition

Kosaku Yoshida, Nagoya U. (1942-53), Osaka U., Tokyo U.
He created the theory of operator semigroups. His celebrated textbook "Functional Analysis" is read all over the world.

Tadashi Nakayama, Nagoya U. (1942-64), Osaka U.
He is one of the members at the foundation of our department. He is famous for his studies on the modular representation theory of symmetric groups and noncommutative rings.

Kiyoshi Ito, Nagoya U. (1942-52), Kyoto U.
He is famous for his formula on stochastic differential equations, which is applied to mathematical finance. He received the first Gauss Prize in 2006.

Masatake Kuranishi, Nagoya U. (1949-63), Columbia U., graduate of Nagoya U.
He did decisive work on the deformation theory of complex structures.

Masayoshi Nagata, Nagoya U. (1950-53), Kyoto U.
He did famous work on the theory of commutative rings and the foundation of algebraic geometry.

Tomio Kubota, Nagoya U. (1952-93), graduate of Nagoya U.
He created the theory of p-adic zeta-functions with Leopoldt.

Masaki Kashiwara, Nagoya U. (1974-77), Kyoto U.
He did decisive work on the theory of D-modules and its application to representation theory.

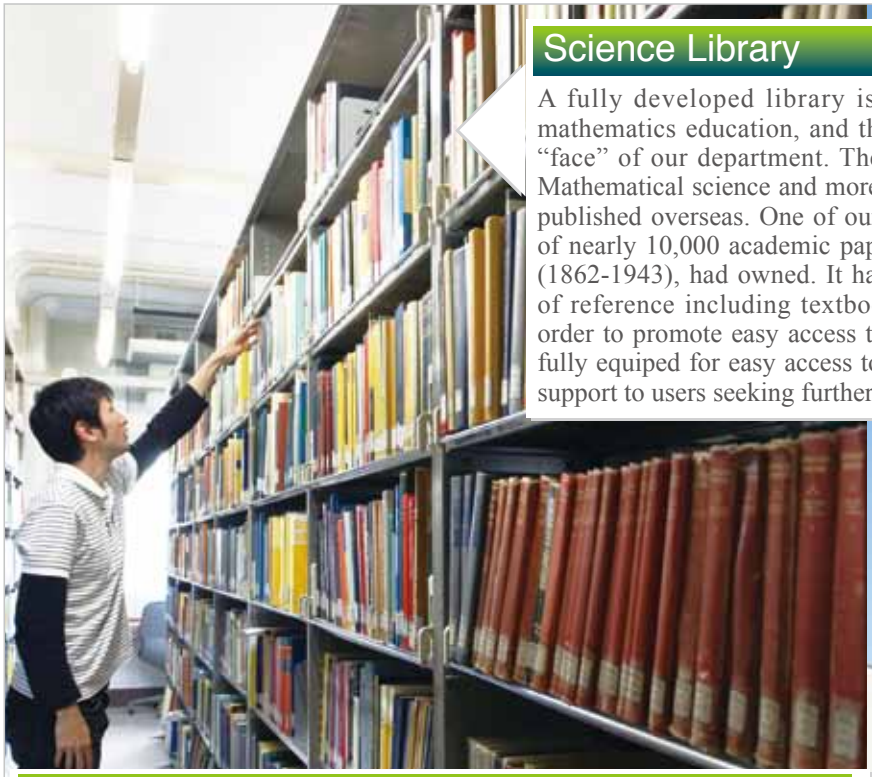
Kazuhiko Aomoto, Nagoya U. (1978-2001).
He created the theory of multi-variable hypergeometric functions, independently of Gelfand.

Shigefumi Mori, Nagoya U. (1980-90), Kyoto U.
He completed the classification theory of three-dimensional algebraic varieties. He received the Fields Medal in 1990.

International Lounge

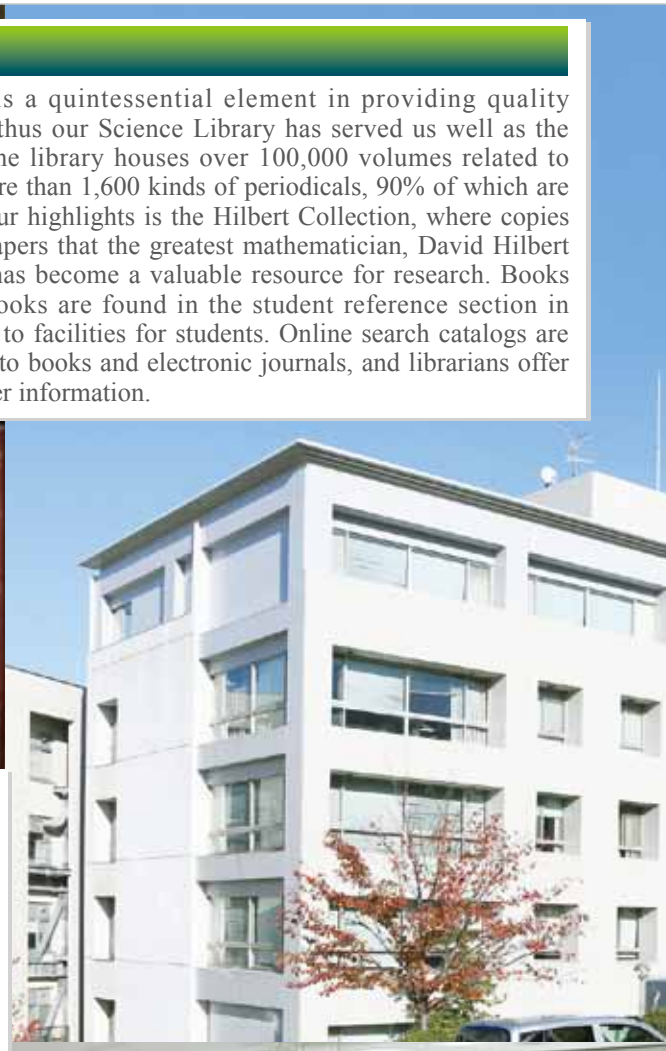
"International Lounge" is now open, which is a room especially designed for international exchange activities of various kinds. For example, we have been holding activities for international students that provide opportunities to socialize with fellow students. We also organize events where participants are encouraged to present their views in languages other than their native language. We are committed to continue offering various activities that foster chances to talk to new people, promote deeper understanding of Japanese culture, and allow students to experience different cultures. Through these events, we hope to help the members of our community to appreciate each other's languages, cultures, and values, and to respect each other's viewpoints.

Support for Education and Research



Science Library

A fully developed library is a quintessential element in providing quality mathematics education, and thus our Science Library has served us well as the "face" of our department. The library houses over 100,000 volumes related to Mathematical science and more than 1,600 kinds of periodicals, 90% of which are published overseas. One of our highlights is the Hilbert Collection, where copies of nearly 10,000 academic papers that the greatest mathematician, David Hilbert (1862-1943), had owned. It has become a valuable resource for research. Books of reference including textbooks are found in the student reference section in order to promote easy access to facilities for students. Online search catalogs are fully equiped for easy access to books and electronic journals, and librarians offer support to users seeking further information.



Computers and Networks

Electronic journals and e-mail are part of the modern indispensable tool of computer networking for researchers of mathematical science. Computer laboratories are located in Graduate School of Mathematics Building (2 rooms) and in Science Building A (1 room). All PCs are connected to the intra-campus network (NICE), which offers reliable high-speed access to the Internet. This computer network environment corresponds to the needs of both graduate students and faculty for exchanging various scholastic information. Our department is committed to enhancing our information technology environment as a research tool not only as a scaffold of numerical analysis and information science, but also for theoretical development by installing various mathematical software.

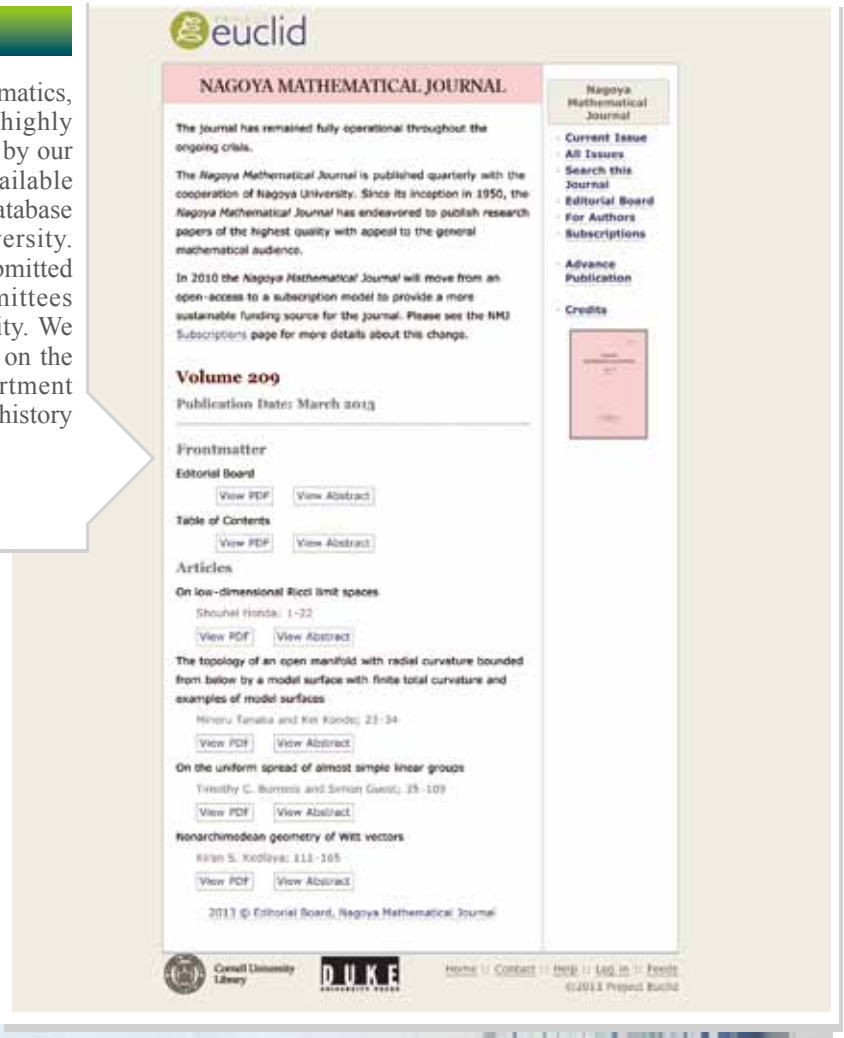
Office of Academic Affairs

The Office of Academic Affairs was established in 2003, in order to provide specific services needed by students and faculty. In 2008, it was reorganized to deal with all educational affairs. For students and faculty, the office processes research grants (Grants-in-Aid for Scientific Research) and student aid to attend workshops, and manages study rooms and locker keys. In assisting department activities the office edits mathematical journals, publishes information in the form of brochures and updates web sites, prepares to hold international conference, such as Nagoya International Conference, and hosts foreign visitors. The office aims at creating better academic surroundings with prompt service responding to department needs, with a friendly atmosphere as their motto.

Nagoya Mathematical Journal

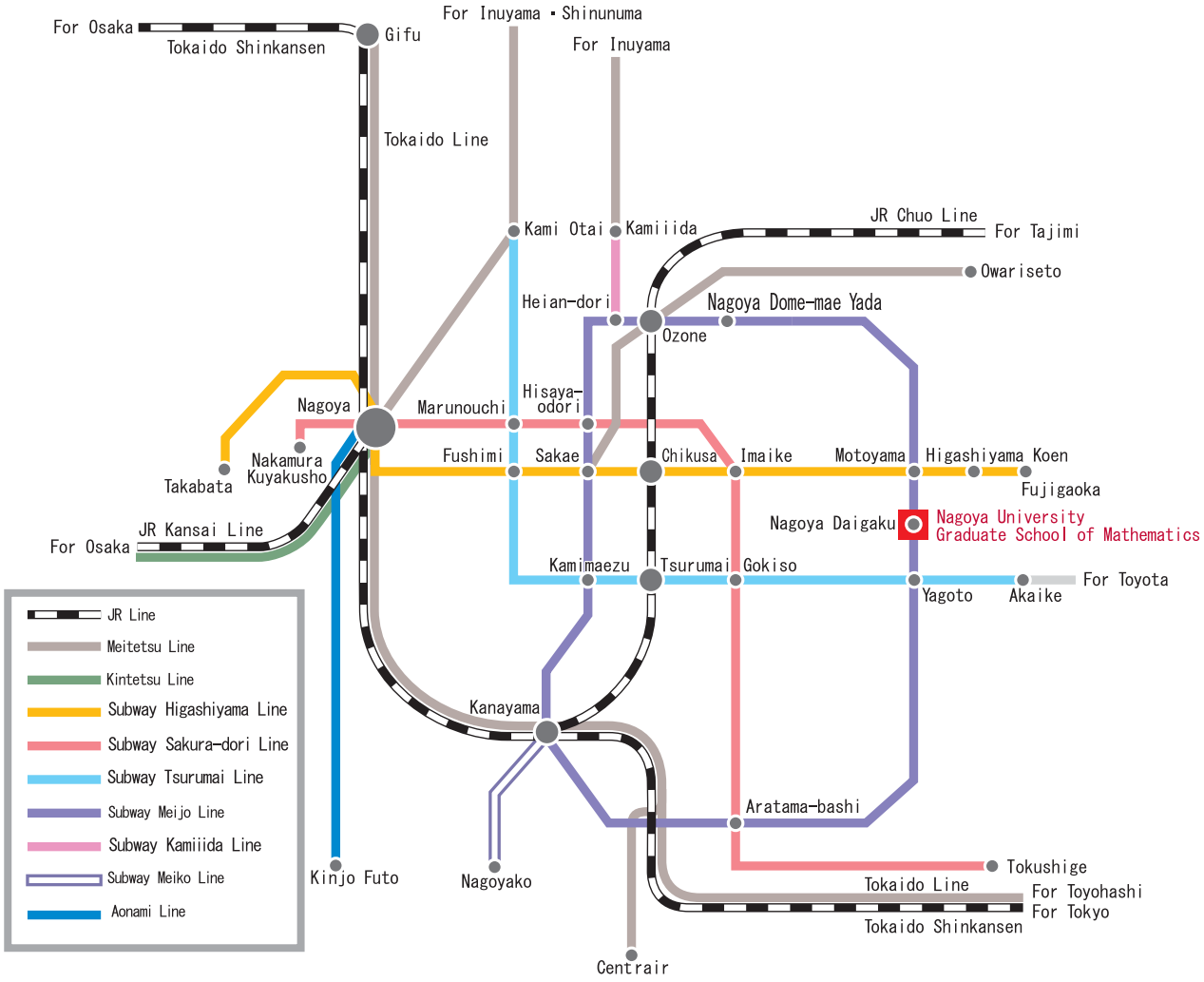
Known as a comprehensive academic journal for mathematics, Nagoya Mathematical Journal (NMJ) has long been highly evaluated internationally, since its first edition published by our department in June of 1950. All back numbers are available as electronic archives, and can be accessed through a database called Project Euclid by the library of Cornell University. While reviewing many creative mathematical papers submitted to the journal from around the world, editing committees make an elaborate effort to maintain its scholastic quality. We firmly believe that the academic value of NMJ depends on the advanced level of mathematics with which our department deals. We are proud of NMJ as proof of the depth of its history and its excellence shown by mathematicians in Nagoya.

http://projecteuclid.org/nmj



Administration Office

The Administration Office of our department supports faculty and students by maintaining campus facilities, purchasing office supplies, and arranging research and business trips. The office, for example, takes care of air-conditioning for computer laboratories and classrooms. Its constant effort provides faculty and students with a cozy environment to research and study, and the smooth arrangement of facility use and meetings. Accordingly, the office plays an important role for both faculty and students, helping them to focus on their business within a comfortable campus, doing its best to offer speedy and accurate service.



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