

SNU SCIENCE

Seoul National University
College of Natural Sciences



**“The important thing is not to
stop questioning.”**

- Albert Einstein

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N A T U R E

M A T T E R

The Universe. Earth. Matter. Life. Civilization. The underlying laws of nature, the infinite mysteries above us. Waiting to be deciphered—like strange signs of a forgotten language. Nature awakes within us a spirit of purpose and enterprise.

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L I F E

E A R T H

U N I V E R S E



S C I E N C E

Moments of discovery. The instant you realize that no one in the history of humankind has ever witnessed what is occurring before your eyes. Potential moments, 24 hours a day, 7 days a week. This is science. Here at SNU.



P R O O F

D I S C O V E R Y

I N V E N T I O N

Sc

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Ce

F R O N T I E R

C R E A T I V E

A journey to an ever-expanding frontier. Continuing the voyage of our predecessors. Exploring uncharted territories, drawing new maps. You are not a lonely traveller. Together we can make a difference.



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C O L L A B O R A T I V E

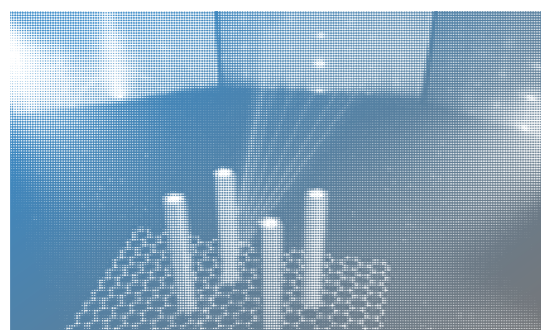
Natural Sciences at a Glance

NUMBER, ORDER, AND PATTERN

Physics




What are the Fundamental Principles of Nature?

What are the fundamental principles of nature? This question forms the core of the academic field of physics. By exploring a diverse range of phenomena, from tiny elementary particles to the immense cosmic space, physicists have devoted their efforts to exploring and charting the underlying laws of nature. The gradual discovery of the basic laws of the universe have revolutionized the development of science and technology throughout history. Today, physics plays an essential role in our understanding of a world that would be utterly unrecognizable without the discoveries of the laws of electricity, thermodynamics, X-rays, radioactivity, magnetism and many others. As this eclectic list of historical discoveries indicates, the field of physics is interdisciplinary in its very nature, traversing areas of astrophysics, chemical physics, computer science, mathematics and engineering—in its endeavors to expose the fundamental principles of nature.



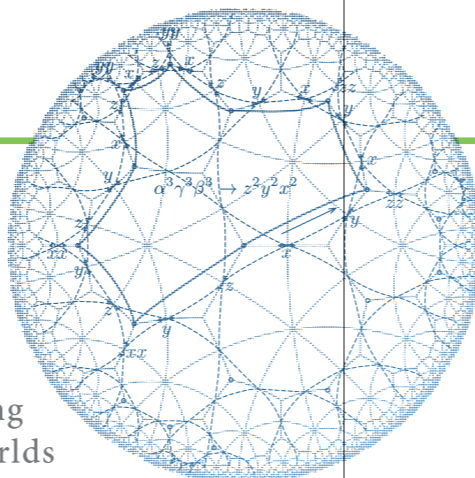
MATTER, STRUCTURE, AND FUNCTION

Mathematics

-  Cayley graph
-  Tessellation from $F_{4,4}$
-  Lagrangian

The Bridge Connecting Abstract and Real Worlds

Mathematics is the language in which we reveal the hidden patterns of nature. “How do we make a tornado in water?” “What does space look like?” “Is our solar system stable?” These are common questions that mathematicians have tried to answer. But also more abstract questions attract mathematicians—for example: “can every even number greater than 2 be expressed as the sum of two primes?” Numerous mathematical fields and traditions have emerged in response to these basic questions. Uncovering the hidden patterns of nature, mathematics is the universal science of connecting—on an abstract or real level—the dots spread across our world.



Chemistry

Toward the Ultimate Understanding of Chemical Principles

Atoms combine to make molecules. Molecules assemble into complex chemical structures. Structure engenders function, and vice versa. By understanding such basic chemical principles, all of which are interacting in a grandiose architecture, we gradually come to recognize the arrangement of the elements and components of the world. It is a recognition that allows us to create new structures and functions. Innovation is thus the ultimate test of our understanding. Chemistry is a central discipline in the field of the natural sciences that evolves through continuous cycles of ‘modeling’, ‘making’ and ‘measuring’ the heterogeneous structures of the world—while striving for the ultimate understanding of chemical principles.

Statistics

Learning from Data of an Uncertain World

Along with the development of modern technology, statistics has increasingly become a central part of many scientific fields, including physics, astronomy, engineering, economics, sociology, psychology, and education. The academic discipline of statistics is devoted to the collection and analysis of large quantities of data, along with interpretation of the results, as well as decision-making processes, predictions, and probability calculations. In the age of the Internet, statistics is vital to an understanding of the ways in which social media and online activities reveal data about the intimate choices we make, how we live, and what we want. Thus, statistics plays a pivotal role in the development of a new paradigm for big data analysis; it helps us understand ourselves as individuals in an increasingly connected world.

Biological Sciences

Unravelling the Mysteries of Complex Biological Systems

Biology is the study of life in all its complex and dynamic forms. Most life forms are composed of cells that perform different functions according to genetic information and other signals. Until recently, biologists tended to focus primarily on the understanding of these general principles underlying biological phenomena. Recent progress in genome sequencing and the development of new analytical tools have expanded the field’s interdisciplinary scope. Scientists in the 21st century will challenge the mysteries of biological systems in the attempt to find answers to global issues such as health risks, food shortages, and climate changes. By studying the multiplicity of living organisms, biologists are at the absolute center of what we treasure most in the world.

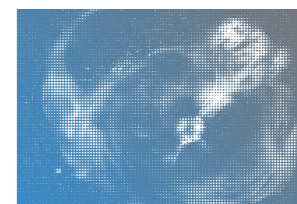
LIFE

Astronomy

The History of the Universe

How did the universe begin? Since time immemorial, the lure of the majestic, starlit sky above has persistently reminded us of the vast mysteries and secrets of the universe. Astronomy is devoted to the understanding of the universe, its origin and evolution, its elements—including galaxies, stars, black holes and exoplanets. By investigating the physics behind phenomena observed over cosmic time, astronomers expand the frontiers of knowledge—both the knowledge of our pre-history as well as the potential history of our future.

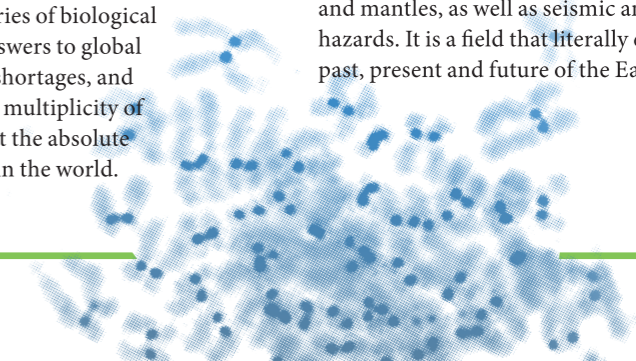
Earth & Environmental Sciences



Understanding the Earth

The Department of Earth, Energy and Environmental Sciences offers a wide range of research opportunities to explore the fundamental nature and interaction of the atmosphere, hydrosphere, biosphere and geosphere. Through cutting-edge experiments, monitoring, observation, and theoretical endeavors we continuously advance our existing knowledge of the physical and chemical processes of the Earth’s interior and exterior dimensions, as well as other planetary bodies. Moreover, our research allows us to trace with ever greater precision the evolution of maritime and terrestrial ecosystems, from the Hadean magma ocean covering the Earth in its early history—to its current stratified formation. Today, as we stand on the threshold of what may be called the anthropogenic climate—an eco-system profoundly, perhaps irreversibly, influenced by human activities—the field of Earth and Environmental Sciences provides crucial knowledge about possible future environmental changes, atmospheric evolution, ocean circulation, tectonic movements of crusts and mantles, as well as seismic and volcanic hazards. It is a field that literally encompasses the past, present and future of the Earth.

UNIVERSE



Science : Making a way to the future

What “ticks” the scientist is the “reverence for the profundity, subtlety and beauty of nature”.



Dean's Message

Natural science is the study of all natural phenomena and the universal laws hidden therein. It is also the foundation of nearly all modern technologies such as biotechnology, and medicine, information and communication technology, nano technology, energy and environmental science, and quantitative finance modeling.

As a world-leading institution of education and research, SNU College of Natural Sciences is the home of eight departments (of Mathematical Sciences, Physics and Astronomy, Chemistry, Biological Sciences, Earth and Environmental Sciences, Statistics, Biophysics and Chemical Biology, and Brain and Cognitive Sciences) and five interdisciplinary graduate programs (in History and Philosophy of Science, Genetic Engineering, Neuroscience, Bioinformatics, and Computational Sciences and Technology). A total of 230 faculty members, 1000 undergraduates, and 2000 graduate students and researchers are working round the clock in their endeavor to unravel the ultimate secrets of nature.

SNU College of Natural Sciences has a rather short history of 40 years now, unlike many other prestigious universities around the world that have built their legacy over the course of hundreds of years. I am proud to note that it has rapidly emerged as a new global powerhouse in the scientific world, but I am more proudly projecting that discoveries unseen elsewhere and technologies that will transform the world beyond our wildest imagination will be brought forth in volume here at our Gwanak campus in the future. Today's young students at SNU, inspired by the wonders of nature, will be tomorrow's scientists lighting up the future of humanity. As we publish this booklet that portrays our College at the present time, I am delighted to anxiously embark on my time travel into the future. Thank you.

Seong Keun Kim

Dean, College of Natural Sciences
Seoul National University

History and Timeline

1946 – 1969

- 1946 · Seoul National University founded
- College of Liberal Arts and Sciences established with five departments (Mathematics, Physics, Chemistry, Biology, and Geology)
- 1958 · Department of Astronomy and Meteorology established
- 1959 · Department of Botany and Department of Zoology separated from Department of Biology
- 1967 · Department of Oceanography established
- 1969 · Department of Microbiology established

1996 – 1999

- 1996 · Change in undergraduate admission system: entering freshmen began applying directly to the College of Natural Sciences
- Department of Computer Science and Statistics renamed to Department of Computer Science and Department of Statistics
- 1997 · Integrated Research Institute of Natural Sciences renamed to Research Institute of Basic Sciences (RIBS)
- Five Research Institutes became affiliated with RIBS
- Early Admission Program implemented
- 1998 · Pre-Veterinary Medicine Program re-established
- 1999 · Change in the undergraduate admission system: entering freshmen applying to either Programs in Basic Sciences or Programs in Earth and Environmental Sciences

1975 – 1976

- 1975 · Seoul National University campuses relocated to Gwanak
- College of Liberal Arts and Sciences reorganized into College of Natural Sciences with 13 Departments
- Department of Computer Science and Statistics established
- Department of Astronomy and Meteorology separated into Department of Astronomy and Department of Meteorology
- 1976 · Integrated Research Institute of Natural Sciences founded
- 5-year SNU-US AID program supporting graduate students in basic science areas initiated
- Pre-Veterinary Medicine Program discontinued

2000 – 2001

- 2000 · Department of Computer Science moved to the College of Engineering
- Department of Mathematics renamed to Department of Mathematical Sciences
- Department of Physics became the School of Physics
- Department of Chemistry became the School of Chemistry
- Departments of Biology, Molecular Biology, and Microbiology became the School of Biology
- Departments of Astronomy, Atmospheric Sciences, and Geological Sciences and Oceanography became the School of Earth and Environmental Sciences
- 2001 · Advanced Marine Policy Program (AMPP) established as an executive program

1982 – 1990

- 1982 · Department of Geology renamed to Department of Geological Sciences
- 1984 · History and Philosophy of Science established as an Interdisciplinary Program
- 1986 · Research Institute of Oceanography founded
- Department of Meteorology renamed to Department of Atmospheric Sciences
- 1989 · Statistical Research Institute founded
- 1990 · Research Institute of Mathematics, Institute of Theoretical Physics, Research Institute for Molecular Science, Research Institute of Mineral Sciences, and Institute of Microbiology established
- Department of Botany and Department of Zoology renamed to Department of Biology and Department of Molecular Biology

2002 – 2009

- 2002 · Bioinformatics and Nano Science and Technology established as Interdisciplinary Programs
- Pre-major system introduced to Astronomy, Atmospheric Sciences, Geological Sciences, and Oceanography
- Science and Policy Advanced Research Course (SPARC) established as an executive program
- 2003 · Change in the undergraduate admission system: freshmen began entering into academic units of Mathematics and Statistics, Physics, Chemistry, Biology, and Earth and Environmental Sciences
- 2007 · Department of Physics and Astronomy established
- 2008 · Department of Biophysics and Chemical Biology, and Department of Brain and Cognitive Sciences established (World Class University Project)
- 2009 · Nano Science and Technology Program discontinued

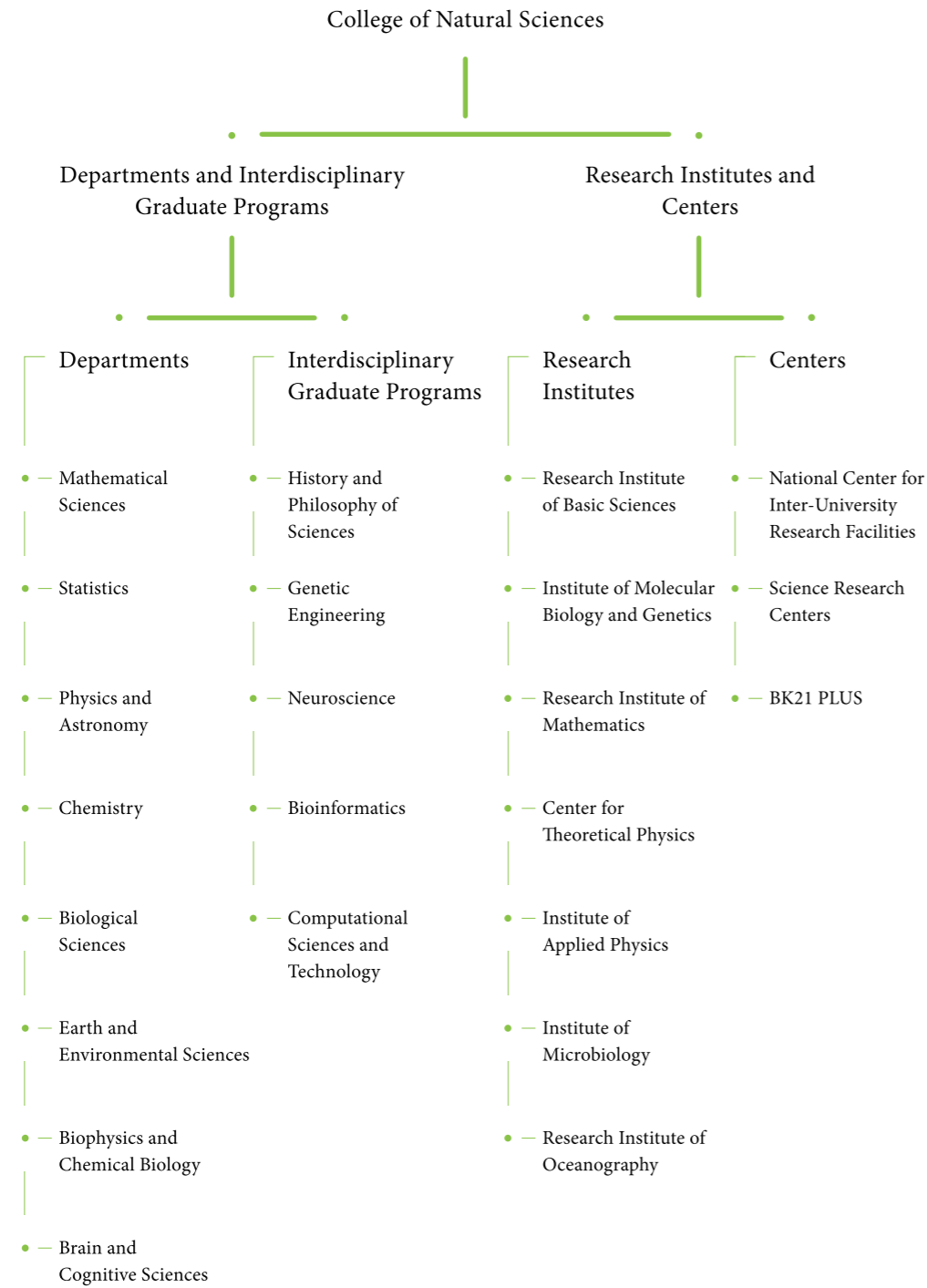
1991 – 1995

- 1991 · Condensed Matter Research Institute and Atmospheric and Environmental Research Institute established
- Department of Computer Science and Statistics restructured into two major tracks: Computer Science; Statistics
- 1994 · Genetic Engineering established as an Interdisciplinary Program
- Department of Geological Sciences and Department of Oceanography began jointly admitting undergraduate students
- 1995 · Change in the undergraduate admission system: entering freshmen began applying to one of the four individual Departments or three Divisions

2010 – Present

- 2010 · Neutrino Research Institute established in RIBS
- 2011 · Nuclear and Particle Astrophysics Institute established in RIBS
- 2012 · Pre-Medicine moved to College of Medicine
- Pre-Veterinary Medicine moved to College of Veterinary Medicine
- Department of Physics and Astronomy changed undergraduate admission system
- 2013 · Change in the undergraduate admission system of Mathematics and Statistics
- Department of Physics and Astronomy restructured into two major tracks: Physics Program; Astronomy Program
- Condensed Matter Research Institute discontinued in RIBS
- Institute of Applied Physics established in RIBS

Organizational Chart



Faculty: Demographics and Activities

Full Time Faculty

As of October 1, 2015 (number in parentheses is the number of foreign faculty)

Department	Professors	Associate Professors	Assistant Professors	Total
Mathematical Sciences	25(1)	10(3)	1(1)	36(5)
Statistics	10(1)	2	1	13(1)
Physics and Astronomy	36	12(3)	4(1)	52(4)
Chemistry	21	11(2)	2	34(2)
Biological Sciences	40(1)	6(3)	4	50(4)
Earth and Environmental Sciences	19(1)	9	6	34(1)
Biophysics and Chemical Biology	7	-	1	8
Brain and Cognitive Sciences	6	1	-	7
Total	157(4)	51(11)	19(2)	227(17)

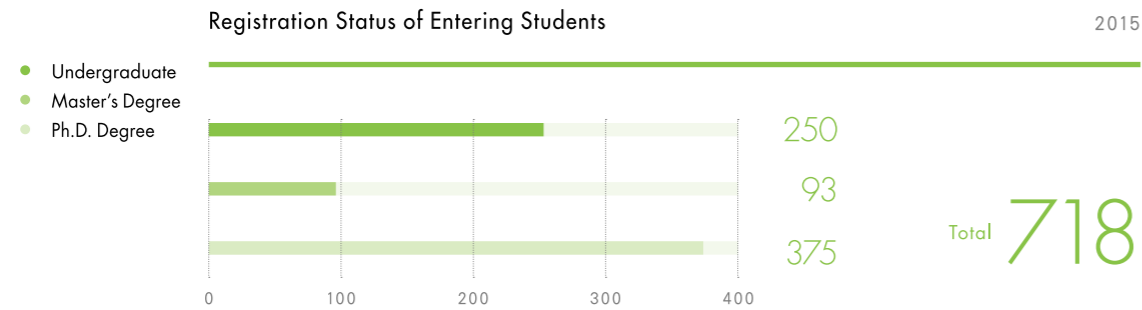
Professional Activities of Faculty Members

Faculty members of the College of Natural Sciences are engaged in a wide range of distinguished scientific activities and academic services within domestic and international research and policy organizations. Among our faculty, over 200 currently serve as editorial board members, along with more than 40 working as advisory committee members of domestic as well as international journals, academic organizations, and administrative bodies. Moreover, many faculty members hold leading positions as presidents or executive members in academic societies across the world.

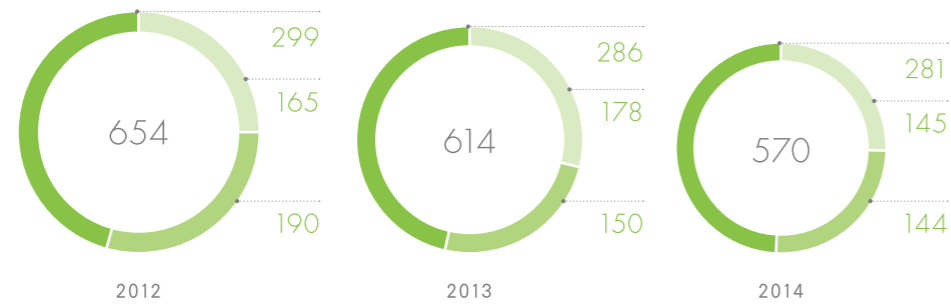


Enrollment and Degrees Awarded

Including Interdisciplinary Graduate Programs



Graduating Students



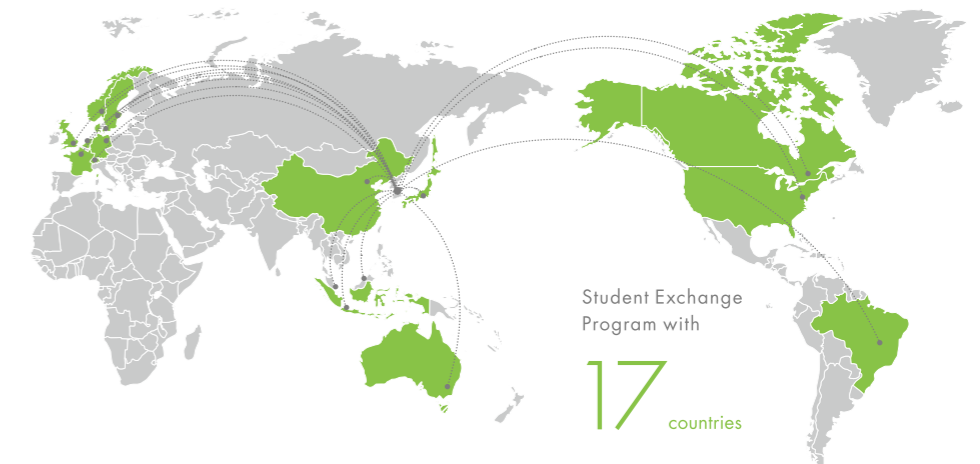
Career Paths After Graduate School

About 20% of our Ph.D. or master's degree graduates find employment in the private sector. Another 20% are hired by research institutes. The rest typically pursue further education at the Ph.D. level, or join postdoctoral training programs at research institutions in Korea and abroad. According to a survey of recent Ph.D. graduates from SNU College of Natural Sciences,* 98% of the respondents are employed in either universities or research institutes. Among them, 10% hold faculty positions in universities (93% in Korea; 7% in foreign institutions). It is a testament to the College's pivotal role in educating and training the next generation of scientists.

* Based on the survey of 938 Ph.D. graduates (2005-2010) conducted in 2013.

College of Natural Sciences in the World

Status of Exchanging Students



Status of MOU with Foreign Institutes

Bulgaria	Bulgarian Academy of Sciences
China	City University of Hong Kong, Shanghai Jiao Tong University, State Oceanic Administration, University of Nanjing
France	University of Paris 6, University of Paris 11
Germany	Dresden University of Technology, Johannes Gutenberg University Mainz, The University of Bonn, University of Cologne
Italy	International Centre for Theoretical Physics
Japan	High Energy Accelerator Research Organization, Hokkaido University, Nagoya University, National Astronomical Observatory, RIKEN, Saga University, Tohoku University, University of Tokyo
Mongolia	National University Of Mongolia
Poland	Polish Academy of Sciences
Myanmar	Dagon University
Russia	Russian Academy of Sciences
Singapore	Otronix Singapore Pte. Ltd.
Sweden	Chalmers University of Technology
UK	Science and Technology Facilities Council - United Kingdom Infrared Telescope
USA	Fermi National Accelerator Laboratory, Florida State University, George Mason University, National Center for Atmospheric Research, University of California, Berkeley, University of Minnesota, University of Pennsylvania

Mentoring & Internship Programs



The College of Natural Sciences provides a diverse range of mentoring and internship programs for undergraduate and graduate students at SNU as well as students from other institutions. For example, the tutorial program is designed to help struggling students in one-to-one sessions to obtain the skills necessary to master college-level mathematics, physics and biology. Each department within the College also organizes numerous seminars, during which undergraduate and graduate students enjoy the privilege of meeting distinguished scholars and scientists. All undergraduate students are required to participate in research internship programs for at least one semester. Through these various activities, our students accumulate knowledge as well as practical know-how and experience vital to a successful career.

GLEAP

Global LEAdership Program



GLEAP is an honor society consisting of sophomores and juniors, which aims to nurture leadership skills and visions. Arranging exchange program opportunities and volunteer activities, GLEAP admits around 20 new sophomores each year who will be mentored by the junior members of the society. GLEAP acknowledges the importance of convergent thinking—as a key feature of scientific thinking today—by pursuing interdisciplinary activities specifically designed to develop future international leaders within the global scientific community.

Student Clubs & Activities

Year 2015



Students in the College of Natural Sciences have numerous opportunities to join clubs and participate in extracurricular activities on campus. Engaging in academic, musical, social, and religious subjects, our students enjoy the full experience of university life.

• **College Clubs**

Schoolmates (music band)
The Photons (baseball team)
NCA (religious group)
Hyurim (social activities)

• • **Other Clubs**

HAT (volunteer work)
Arete (academic; humanities)
Bionese(academic; biological sciences)
B.Hott (dance)
...

Student Counseling Center

Ja : wuri



The counseling center "Ja:wuri" helps students develop abilities to successfully grow and live on campus, and also provides group counseling and psychological test services.

Contact T. +82-2-880-4340 E. cns.counsel@snu.ac.kr

• **Counseling program**

Individual counseling, group counseling, psychological testing

• • **Educational program**

Harassment prevention training, special lectures

• • • **Specialized program**

Psychological testing for incoming students, academic counseling

Education and Research

Departments and Interdisciplinary Graduate Programs
Research Insitutes
Executive Programs



Departments and Interdisciplinary Graduate Programs

DEPARTMENTS

Mathematical Sciences

Statistics

Physics and Astronomy
(Physics-Astronomy)

Chemistry

Biological Sciences

Earth and Environmental Sciences

Biophysics and Chemical Biology

Brain and Cognitive Sciences

INTERDISCIPLINARY GRADUATE PROGRAMS

History and Philosophy of Sciences

Genetic Engineering

Neuroscience

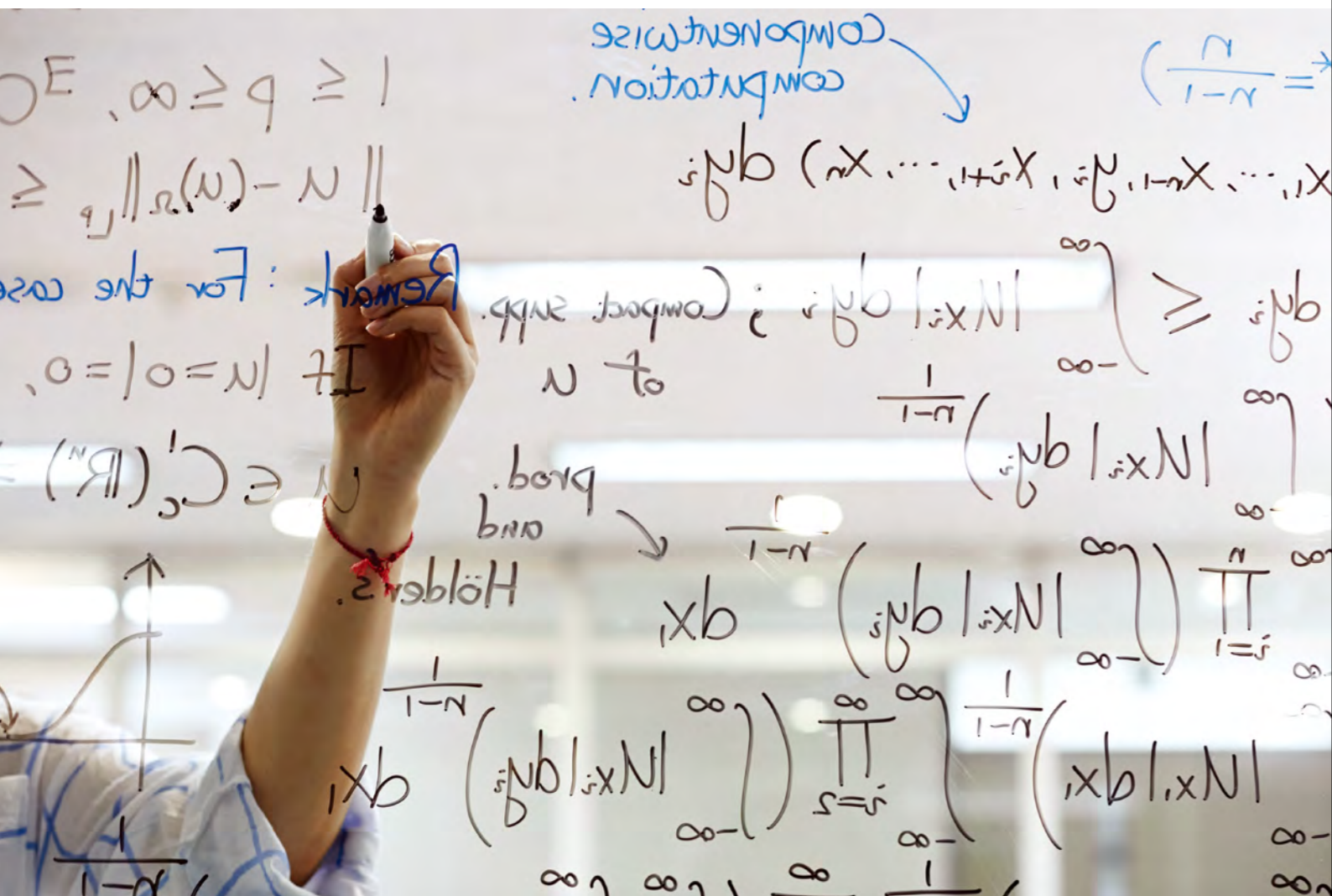
Bioinformatics

Computational Sciences and
Technology

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MATHEMATICAL SCIENCES

www.math.snu.ac.kr



The Department of Mathematical Sciences strives toward excellence in research and education in the main areas of mathematics such as Algebra, Analysis, Geometry, and Applied mathematics. Our department offers basic and liberal education for students from other fields as well as students who are majoring in mathematics. We also conduct research in cooperation with Brain Korea 21 PLUS, PDE Functional Analysis Research Center, and the Research Institute of Mathematics.

RESEARCH AREAS

- Algebra**
 An algebraic system is an arithmetic set which satisfies a few axioms. Algebra is the study of many algebraic structure theories about groups, rings, modules, vector spaces, fields and categories, etc.
- Analysis**
 Mathematical analysis is a branch of mathematics studying differentiation and integration rigorously. By using mathematical analysis, one can study properties of various kinds of functions.
- Geometry**
 Various problems arising in mathematics or science can be realized as a visual model. Geometry is the field of mathematics to study such models.
- Topology**
 Topology, initiated by Henri Poincare in the early 20th century, is a branch of mathematics studying shapes and spaces that are preserved under continuous deformations.
- Applied mathematics**
 Applied mathematics studies problems arising from the natural sciences and engineering using the results of pure mathematics.

CAREER PATHS FOR GRADUATES

More than half of the department's undergraduate students go on to graduate school (domestic and abroad). After acquiring master's and doctoral degrees, they play an active part in academia. Furthermore, plenty of graduates utilize their mathematical knowledge throughout various fields. Especially, the need for high-quality mathematical human resources is increasing as the Information Age progresses. Therefore the prospects for graduates are expected to be diverse.

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 Sciences, Seoul National University,
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STATISTICS

<http://stat.snu.ac.kr>



Statistics is the science of learning from data with a focus on uncertainty study and decision making based on data. The power of modern information technology is opening a new era of massive and high dimensional data common in almost all fields of science. Genomics, climatology, brain and cognitive science, and medicine have generated massive unstructured data that is beyond the capabilities of traditional statistical methods. Statistics plays a central role in attempts to make new scientific discoveries and social values by analyzing large unstructured data.

RESEARCH AREAS

- **Statistical Theory and Probability**

This area of research focuses on the theoretical foundation of statistical models and data analysis, including high-dimensional data analysis, machine learning, large sample theory, functional data analysis, nonparametric function estimation, Bayesian statistics, stochastic processes and probability theory.

- **Statistical Methods and Computation**

Department faculty and researchers share an interest in the development of statistical models and computation for data collected in various fields. Research areas include statistical computation, regression analysis, experimental design, generalized linear models, multivariate data analysis, time series analysis and survival analysis.

- **Interdisciplinary Research**

In the era of big data, statistics play an important role in interdisciplinary research. Our interdisciplinary research encompasses such areas as finance/economics, meteorology/climate change, neuroscience, signal processing, bioinformatics, medicine, and astronomy.

CAREER PATHS FOR GRADUATES

Our undergraduate and master's degree students have an excellent record of graduate school admissions and job placement. The demand for our graduates is strong. Many of them are employed in IT and financial services industries. In the 2000s, 22 out of 58 Ph.D. graduates chose careers in academia. Others have chosen government and private sector jobs in finance, research institutes, consulting, and health care.

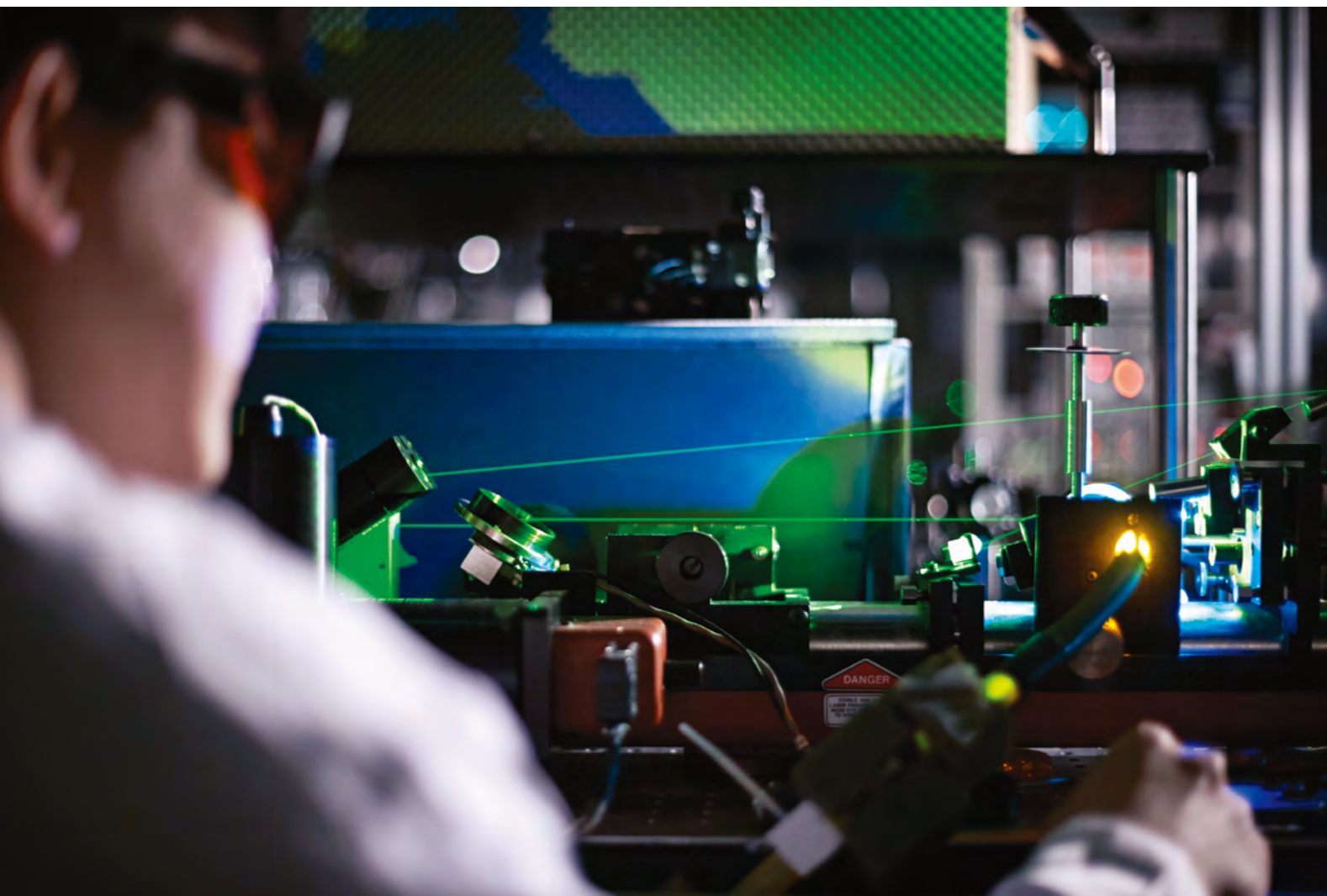
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PHYSICS AND ASTRONOMY : PHYSICS PROGRAM

<http://physics.snu.ac.kr>



The aims of physics are to discover the fundamental principles of nature, to understand various physical phenomena using basic principles and eventually, to contribute to scientific and technical innovation. The Department has been a leading physics department in Korea since its inception in 1946. At present, we have 40 regular faculty members, 50 research associates along with 250 undergraduates and 400 graduate students in the department.

RESEARCH AREAS

- **Particle and Nuclear Physics Theory and Experiments**
We pursue a unified understanding of the basic interactions in nature through the study of elementary particles and nuclei. Using accelerators or through astronomical observations, we try to experimentally prove various theoretical models.
- **Statistical Physic / Condensed Matter Physics Theory and Experiments**
We try to understand various phenomena such as phase transitions and complex systems as well as condensed matter systems including nanostructures and soft matter.
- **Atomic, Molecular and Optical Physics**
We study laser physics, non-linear optics, quantum optics and information, quantum gas physics, and nano-optics.
- **Biophysics and Plasma Physics**
We study the basic working principles of life using physical measurement tools and models. An intense terahertz wave made from non-neutral electron plasma and femtosecond lasers is used for the study of biomedical systems.

CAREER PATHS FOR GRADUATES

Upon finishing the undergraduate program, the majority of our graduates move on to domestic or international graduate programs for advanced degrees. Most doctoral graduates continue to develop their careers as physicists by engaging in research and education in the world's leading universities and research institutes, as well as by contributing to research and development in industrial laboratories.

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PHYSICS AND ASTRONOMY : ASTRONOMY PROGRAM

<http://astro.snu.ac.kr>



How did the universe form? Stars, planets, black holes, galaxies, and other inhabitants of the universe are continuously challenging our minds. The scientists of the SNU Astronomy Program are at the frontier of research on the origin and evolution of the universe. Currently, the astronomy major comprises 12 faculty members, 10 research scientists, and about 100 students in the undergraduate and graduate programs. Since its inception in 1958, the Astronomy Program has been providing a world-class environment for research and education.

RESEARCH AREAS

- [The Sun and Solar System](#)

The main topics include solar magnetic activities and changes in space environments as well as comets and interplanetary dust.

- [Stars, Interstellar Matter, and the Galaxy](#)

The main topics include star formation, stellar evolution, supernovae and remnants, physics and chemistry of interstellar matter, dynamics of star clusters, neutron stars, black hole mergers and gravitational waves, galactic dynamics and star formation feedback.

- [External Galaxies, Supermassive Black Holes, and Cosmology](#)

The main topics include galaxy formation and evolution, supermassive black holes and active galactic nuclei, supernovae and gamma-ray bursts, cosmology, and large scale structure.

- [Instrumentation](#)

The main topics include developments of radio, optical, and near-infrared instruments, interferometers, adaptive optics, gravitational wave detectors, and solar instruments (spectrographs, polarimeters, coronagraphs).

CAREER PATHS FOR GRADUATES

Most of the undergraduates advance to our graduate program. Ph.D. recipients from our program become professional astronomers working at universities and research institutes. Other graduates move on to various career paths such as science media, education, astronomical instrumentation, research and development, or various professions, including physicists, medical doctors, and lawyers.

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CHEMISTRY

<http://chem.snu.ac.kr>



Through chemical bonding, individual atoms assemble into molecules and higher-order architectures with an amazing level of structural diversity and complexity. Chemistry is a core discipline of the natural sciences that strives to expound the fundamental relationship among structure, function, and reactivity of molecules and materials. As of 2015, a total of 34 faculty members teach and advise over 220 undergraduate and 240 graduate students within the department. A recent QS World University Ranking (2015) has placed SNU Chemistry Department 21st in the world, which reconfirms its status as a world-class chemistry program in education and research.

RESEARCH AREAS

Model, Make, and Measure. These three words starting with “M” best describe how chemical research is carried out. While the traditional subdivisions of Physical, Analytical, Inorganic, Organic, and Biological Chemistry continue to serve as a foundation for teaching and training, exciting new areas of research crossing traditional disciplinary boundaries constantly emerge at the frontiers of modern chemistry.

Specific areas of research at SNU Department of Chemistry include: Molecular Spectroscopy; Reaction Mechanisms and Kinetics; Molecular Reaction Dynamics; Structural Chemistry; Statistical Thermodynamics; Computational Chemistry; Electrochemistry; Analytical Separation; Chemical Synthesis; Transition Metal Chemistry; Solid-State Chemistry; Bioinorganic Chemistry; Physical Organic Chemistry; Photochemistry; Bioorganic Chemistry; Organometallic Chemistry; Medicinal Chemistry; Chemical Enzymology; Nucleic Acid Chemistry; Protein Engineering; Chemical Biology; Polymer Chemistry; Supramolecular Chemistry; Nanochemistry; Materials Chemistry.

CAREER PATHS FOR GRADUATES

A total of 2,840 B.S., 1,790 M.S., and 580 Ph.D. degrees have been awarded to the graduates of SNU Chemistry Department. A significant portion of our graduates have found career opportunities in leading academic institutions and research laboratories in Korea and abroad. Industrial laboratories and government positions for decision making are alternative career tracks as well.

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BIOLOGICAL SCIENCES

<http://biosci.snu.ac.kr>



Biological science addresses a broad range of questions, starting from ‘What is a life?’ and ‘From where do human beings originate?’ to ‘How to fight against diseases, food shortage, and climate changes?’ Fifty faculty members of the Department of Biological Sciences at SNU are leaders in their fields, conducting creative research and publishing their research in high impact journals. Biology is rapidly transforming into an interdisciplinary science that embraces many other areas in basic science and engineering. Our curriculum and training encourage students to learn diverse scientific areas as well as core biology so that they can create and lead biological science and technology in the future.

RESEARCH AREAS

- **Molecular and Cellular Biology**

An area to understand biological phenomena at the molecular and cellular level. The main topics include mechanisms underlying gene expression, intra- and intercellular signaling processes, microRNA and chromatic remodeling complexes, and their effects on cell fate and behaviors.

- **Integrative Organismal Biology**

An area to understand biological phenomena at the organismal level. Main topics include immune responses, perception and responses of the brain and neurons to external stimuli, viral and bacterial pathogens and diseases, and developmental processes of multicellular organs and tissues.

- **Systematics, Evolution, and Ecology**

An area to understand the diversity and evolution of organisms and their interaction with the environment. Using both experimental and theoretical approaches, this area is employed to predict the consequences of climate changes for diversity and evolution.

CAREER PATHS FOR GRADUATES

After completing the undergraduate program, many students pursue master’s or doctoral degrees in graduate schools. They become research scientists or faculty members in research institutes or universities. Many graduates of the Department of Biological Sciences are also working in diverse places such as corporations, government, journalism, and hospitals.

Department of Biological Sciences, Room 120, Bldg. 504, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea

T. +82-2-880-6685~6, 6698~9
F. +82-2-872-1993

EARTH AND ENVIRONMENTAL SCIENCES

<http://sees.snu.ac.kr>



The Department of Earth and Environmental Sciences conducts world class research into the fundamentals of Atmospheric Sciences, Earth System Sciences, and Oceanography. The Department has succeeded in organizing a strong interdisciplinary research program with critical efforts towards solving the problems related to the Earth's tectonic reconstruction, ocean circulations, atmospheric dynamics, and evolution of the ecosystem. The discovery, principal findings and development of knowledge lead us to predict and solve anthropogenic global environmental changes, natural hazards, and changes in terrestrial and marine resources and the ecosystem. The development of such an integrated program with a global scope contributes to the education of future leaders with broadened insights into scientific excellence in the field of earth and environmental sciences.

RESEARCH AREAS

- **Atmospheric Sciences**

Atmospheric Sciences are concerned with the understanding of mechanisms and principles in atmosphere dynamics and relevant processes. Specifically, the area deals with the nature of weather phenomena and their prediction, climate variability, extreme weather/climate events associated with global warming and environmental changes, and air pollution and preservation of the atmosphere.

- **Earth System Science**

Faculty and researchers within the earth system sciences examine the nature of the entire Earth from its core to thin surfaces. The length scale of current research spans from sub-atomic to global, providing an opportunity to solve the problems involving the Earth's chemical, physical and biological processes. The time scale of the conducted research varies from that of a human lifetime to the billions of years of the geologic timescale, revealing hidden signatures of evolutionary paths of the Earth's system.

- **Oceanography**

Oceanography integrates biology, chemistry, geology, and physics to provide insights into processes related to the ocean. Major areas of research include: the transport of the ocean and its circulation, and the related phenomena, including El Niño and global warming; the origin of the compositional variation in ocean chemistry; marine ecosystems; distribution of resources in the oceans; marine tectonic environments; and preservation/restoration of the marine biosphere.

CAREER PATHS FOR GRADUATES

Traditionally, graduates with a bachelor's degree often pursue higher education in the graduate schools of SNU and other leading universities in the world. Graduates with a master's or a doctoral degree pursue careers as researchers at universities and laboratories. As there is a clear global awareness of the increasing importance of the environment on quality of life, professionals with the expertise in earth and environmental sciences are needed in various sectors of society, including government agencies, academic institutions, private corporations, and broadcasting companies.

Department of Earth and Environmental Sciences, Room 311, Bldg. 25-1, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea

T. +82-2-880-6743

F. +82-2-871-3269

BIOPHYSICS AND CHEMICAL BIOLOGY

<http://bpcb.snu.ac.kr>

The world's first department merging biophysics and chemical biology, CNS's Department of Biophysics and Chemical Biology was established in September, 2009. Supported by the Korean government's WCU Program and since 2013 also by BK21 PLUS, this graduate level department in particular aims to promote innovative research skills through lectures, seminars, and laboratory work that expose students to interdisciplinary, scientific approaches.

RESEARCH AREAS

- **Biomolecular interactions for signal transduction**

We are testing new methods to investigate cell signal transduction at the molecular level. The goal is to develop new techniques to monitor the activity of a single membrane protein molecule by using single-molecule spectroscopy and nanophotonic tools, thereby elucidating the cell signaling system.

- **Gene regulation and metabolism**

One of our major research objectives is to understand the fundamental, physical basis of cell metabolism. In order to achieve this goal, we apply single-molecule methods to study the mechanochemistry of biomolecules, novel bioprobes, as well as small molecules to control the gene expression involved in metabolism.

- **Biosensors and cell engineering**

In order to develop advanced techniques for biosensing and cell engineering, we apply nanotechnology to biological systems. The aim is to develop nanophotonic biosensing techniques as well as nanomaterials to control cell growth and differentiation.

CAREER PATHS FOR GRADUATES

PhD graduates of Biophysics and Chemical Biology usually find employment at large research institutes or universities, either as postdoctoral researchers or as faculty.

Department of Biophysics and Chemical Biology, Room 306, Bldg. 501,
College of Natural Sciences, Seoul National University, 1 Gwanak-ro,
Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-4358 F. +82-2-882-4358

BRAIN AND COGNITIVE SCIENCES

<http://bcs.snu.ac.kr>

CNS's Department of Brain and Cognitive Sciences aims to educate competent neuroscientists by focusing on three areas: the global, the creative, and the interdisciplinary. As global neuroscientists, our graduates will possess the skills and experience necessary to produce globally competitive research. As creative neuroscientists, our students are continuously encouraged to develop creative and innovative ways of thinking. And, finally, as interdisciplinary neuroscientists, our graduate students are deeply committed to interdisciplinary, broad-minded and undogmatic approaches to scientific problems.

RESEARCH AREAS

- **Gene to Behavior Unit**

This unit aims to elucidate the molecular and cellular mechanisms in animal behavior.

- **Systems and Cognitive Neuroscience Unit**

The overall goal of this unit is to understand neural mechanisms of information processing by sensory, perceptual, and higher cognitive systems.

- **Clinical Cognitive Neuroscience Unit**

This unit aims to understand the neural mechanisms in neuropsychiatric disorders in order to refine and improve the prognosis of patients' cognitive dysfunctions.

CAREER PATHS FOR GRADUATES

Master's Degree Program: Graduates holding a Master's degree in Brain Cognitive Sciences may continue their training in the doctoral program—or pursue career opportunities in the private sector, or government-funded institutes, organizations, and hospitals.

Doctoral Program: Graduates holding a Ph.D. degree usually continue their research careers as post-doctoral scientists.

Department of Brain and Cognitive Sciences, Room 105B, Bldg. 203,
College of Natural Sciences, Seoul National University, 1 Gwanak-ro,
Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-8011 F. +82-2-871-9129

INTERDISCIPLINARY
GRADUATE PROGRAM

HISTORY AND PHILOSOPHY OF SCIENCE

<http://phps.snu.ac.kr>

As the oldest and largest of its kind in Korea, this program has been a major center of teaching and research in the field domestically as well as internationally. Founded in 1984, the program offers graduate courses on the nature of science, the historical origins and developments of scientific fields, and the role of science in contemporary politics, culture, and society. It is difficult to overestimate the impact of science on the current conditions as well as future directions of our world. Thus, understanding of the historical, philosophical and social dimensions of science is indispensable in a modern, dynamic society.

RESEARCH AREAS

History of science, philosophy of science, STS (Science and Technology Studies)

Interdisciplinary Program in History and Philosophy of Science, Room 408, Bldg. 25, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-6759 F. +82-2-886-6758

INTERDISCIPLINARY
GRADUATE PROGRAM

GENETIC ENGINEER- ING

<http://ipge.snu.ac.kr>

Founded in 1984 with the aim of providing a broad range of educational and practical opportunities for students, this program initially offered lectures to students enrolled in the master's course in molecular biology, but was expanded significantly during the 90s—after the construction of the Genetic Engineering Building—in response to the growing needs within the field. Today, the program offers a truly interdisciplinary educational experience for master's degree students as well as doctoral students.

RESEARCH AREAS

Adipose cell and energy metabolism, genes and development, tumor suppressors and cell divisions

Interdisciplinary Program in History and Philosophy of Science, Room 433, Bldg. 105 (West Bldg.), Institute of Molecular Biology and Genetics, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-4422 F. +82-2-882-4335

INTERDISCIPLINARY
GRADUATE PROGRAM

NEUROSCI- ENCE

<http://hosting03.snu.ac.kr/~neurosci>

This program focuses on the basic principles of the brain and the nervous system, and their practical applications in the fields of biomedical science and engineering. The primary goal of the program is to educate and guide graduate students to become future leaders in neuroscience and related scientific areas.

RESEARCH AREAS

Cellular and molecular neuroscience, cellular neurophysiology, systems neuroscience, behavioral neuroscience, computational neuroscience

Interdisciplinary Program in Neuroscience, Room 503, Bldg. 504, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-6696

INTERDISCIPLINARY
GRADUATE PROGRAM

BIOINFOR- MATICS

<http://ipbi.snu.ac.kr>

As an emerging discipline that integrates biology and information science, bioinformatics is making significant contributions to biological and medical research. This program aims to educate and train future leaders in bioinformatics.

RESEARCH AREAS

New bioinformatics for combining “omics” and network data, metagenomics, cancer genomics

Interdisciplinary Program in Bioinformatics, Room 408, Bldg. 25, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-9023 F. +82-2-888-9623

INTERDISCIPLINARY
GRADUATE PROGRAM

COMPUTA- TIONAL SCIENCES AND TECHNOLOGY

<http://cst.snu.ac.kr>

Computational modeling and simulation has become an integral part of many scientific disciplines. CST aims to develop and apply advanced computational theories and methods to solve challenging problems in science, engineering, and medicine.

RESEARCH AREAS

Computational modeling, high-performance computing, algorithm development and analysis

Interdisciplinary Program in Computational Sciences and Technology, Room 408, Bldg. 25, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-6758

Research Institutes

Research Institute of Basic Sciences
 Institute of Molecular Biology and Genetics
 Research Institute of Mathematics
 Center for Theoretical Physics
 Institute of Applied Physics
 Institute of Microbiology
 Research Institute of Oceanography



RESEARCH INSTITUTE OF BASIC SCIENCES (RIBS)

<http://ribs.snu.ac.kr>

Initially founded as the Integrated Research Center for Natural Science (1976), RIBS has developed into its current structure by merging five research centers of CNS (1997), and reorganizing affiliated research institutes (2002). RIBS facilitates research and educational activities by providing administrative and financial support for both faculty and students of CNS. Major activities of RIBS include: awarding seed grants for newly appointed faculty; undergraduate research internships; managing extramural and internal funding; and subsidizing expenses for editing services, journal subscriptions, and laboratory safety.

RESEARCH INSTITUTES/CENTERS

- Statistical Research Institute
- Research Institute of Molecular Science
- Institute of Geological and Environmental Sciences
- Atmospheric and Environmental Research Institute
- Institute of Molecular Cell Biology
- Neutrino Research Institute
- Institute for Nuclear and Particle Astrophysics
- Science Culture Research Center

The Research Institute of Basic Sciences, Room 207, Bldg. 501, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
 T. +82-2-880-5492 F. +82-2-888-4185

INSTITUTE OF MOLECULAR BIOLOGY AND GENETICS (IMBG)

<http://imbg.snu.ac.kr>

Established in 1985, IMBG at SNU has served as the hub for teaching and research in the biological sciences. The main building of IMBG was opened in 1991, and expanded in 2013 to house over 100 researchers. The main areas of research at IMBG include fundamental biological sciences (molecular biology; cell biology; genetics; immunology; plant physiology; bioinformatics) as well as medical sciences and applied biological engineering. Emphasis is also placed on joint research projects to maximize the advantage of IMBG as a multidisciplinary research institute.

The Institute of Molecular Biology and Genetics, Room 109, Bldg. 105, Institute of Molecular Biology and Genetics, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
 T. +82-2-880-5491 F. +82-2-874-1206

RESEARCH INSTITUTE OF MATHEMATICS (RIM)

<http://rims.math.snu.ac.kr>

RIM was established in 1990 to promote research in both pure and applied mathematics. The institute supports collaborative research in mathematics, both domestic and international, as well as applied mathematics of relevance to business and industry. RIM hosts visiting scientists for seminars and conferences, and maintains its own mathematics library with extensive collections of monographs and journals.

Research Institute of Mathematics, Room 305, Bldg. 129, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-6562 F. +82-2-877-8435

CENTER FOR THEORETICAL PHYSICS (CTP)

<http://ctp.snu.ac.kr>

CTP was established in 1990 to promote research in theoretical physics. About 30 physicists currently conduct scientific research and offer academic programs in what is becoming an international research institution. The goal of CTP is to use high-level theoretical reasoning to build general theories about natural phenomena.

The Center for Theoretical Physics, Room 513, Bldg. 56, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-6523 F. +82-2-884-7167

INSTITUTE OF APPLIED PHYSICS (IAP)

<http://phya.snu.ac.kr/IAP>

IAP was founded in 2013 to promote interdisciplinary research in applied physics and collaborative research with industries. With an aim to develop into a world-class research institute in applied science and technology, IAP is actively pursuing exchange programs with leading institutions, both domestic and abroad, and cutting-edge research opportunities with industrial laboratories.

Institute of Applied Physics, Room 212, Bldg. 56, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-8515 F. +82-2-876-2590

INSTITUTE OF MICROBIOL- OGY

<http://imsnu.re.kr>

IM at SNU (IMSNU) was established in 1990 to promote research and education in both basic and applied sciences of microorganisms. The main activities of IM include: collaborative/interdisciplinary research in microbiology; teaching and training of graduate and postgraduate students; information/data search and analysis; maintaining instrumentation facilities; establishing and managing joint research projects with industrial and academic laboratories.

The Institute of Microbiology, Room 223, Bldg. 504, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-6710 F. +82-2-888-4911

RESEARCH INSTITUTE OF OCEANO- GRAPHY

<http://rio.snu.ac.kr>

RIO was established in 1986 and was promoted in 1992 to an affiliated research center of the College. It also has a coastal branch, the East Sea Marine Research Center (Donghae City, Gangwon Province). The primary goals of RIO are to advance ocean science and to provide high-level education in oceanography and other ocean-related fields through basic and applied research activities in regional seas and open oceans.

Research Institute of Oceanography, Room 202, Bldg. 25-1, College of Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-6512 F. +82-2-887-8821

Executive Programs

Science and Policy Advanced
Research Course (SPARC)

Advanced Marine Policy
Program (AMPP)



Ve

SCIENCE AND POLICY ADVANCED RESEARCH COURSE (SPARC)

<https://sparc.snu.ac.kr>

SPARC offers a unique opportunity for global leaders from all walks of life to come together in a joint effort to understand the implications and challenges of science and technology, and to glimpse a vision of future high-tech societies. The program was first offered in 2002, and has so far produced more than 800 graduates. SPARC invites leaders in different fields to share their experiences and opinions on scientific research, and the future role of technological innovations. SPARC runs on a semester system (with classes beginning in March and September), and provides lectures on topics related to the natural sciences, as well as social sciences, humanities, and global leadership.



Science and Policy Advanced Research Course, Room 230, Bldg. 501,
College of Natural Sciences, Seoul National University, 1 Gwanak-ro,
Gwanak-gu, Seoul 08826, Korea
T. +82-2-880-6251 F. +82-2-878-9674

ADVANCED MARINE POLICY PROGRAM (AMPP)

<http://ampp100.com>

Founded in 2002, AMPP is the only advanced marine executive program in Korea. The program thus far has produced over 360 graduates. AMPP rigorously selects leading figures working in marine-related areas in Korea, who are given the opportunity to pursue general knowledge of marine science, the latest scientific developments within the field, and above all a discussion forum for current issues within marine-affiliated industries and policy areas. Over the years, AMPP has become a vital center for the education of leaders within the fields involving marine research.

Advanced Marine Policy Program, Room 202, Bldg. 25-1, College of
Natural Sciences, Seoul National University, 1 Gwanak-ro, Gwanak-gu,
Seoul 08826, Korea
T. +82-2-880-6512 F. +82-2-887-8821

NATURAL SCIENCE PUBLIC LECTURE



The College runs various programs for the popularization of science. This lecture series intends to provide students and the general public with opportunities to become familiar with natural science. Since 1994, this lecture has been given on five to eight different topics every February. It contributes to the development of science by expanding the scientific thinking of an audience of about 1500.

- Audience . General admission
- Time . February
- Topic . To be determined
- Contact . College of Natural Sciences

<http://cns.snu.ac.kr> +82-2-880-8156, 8160

NATURAL SCIENCE SUMMER CAMP



This program provides an opportunity to students to deepen their understanding of the natural sciences and learn about advanced laboratory tools and techniques. Lectures are given by professors, and counseling services by current undergraduate students encourage participants to explore future career opportunities in science.

- Eligibility . 11th graders
- Fields . Mathematics, Statistics, Physics, Astronomy, Chemistry, Biology, Earth Science
- Time . July
- Contact . College of Natural Sciences

<http://cns.snu.ac.kr> +82-2-880-8156, 8160

SCIENCE ON SATURDAY LECTURE SERIES



This lecture provides talented middle and high school students with an opportunity to explore future careers in science.

- Eligibility . 9th and 10th graders
- Time . 3-6 PM, Saturdays
(10-week lecture series beginning in March and September)
- Contact . SNU Science Outreach Center

<http://tist.snu.ac.kr> +82-2-880-6689

SUMMER SCIENCE CAMP



The Students Association of the College has been running Summer Science Camps since 2007. Undergraduate students from six departments volunteer for “Laboratory Camp” and “College Admissions Counseling” and visit rural areas in Korea to motivate 1st-12th graders to become more interested in science.

- Eligibility . Elementary, middle, and high school students residing in rural areas
- Time . Beginning of August
- Contact . Administration Office of the College of Natural Sciences

+82-2-880-6506,8

OBSERVATORY OPEN HOUSE



The Astronomy Program in the Department of Physics and Astronomy held an annual Observatory Open House from 1983 to 1997. In 1998, this program became monthly events to promote public interest in and understanding of space. Currently, Observatory Open House is held six times a year.

- Eligibility . Open to the general public
- Time . Every March, April, May, September, October, and November
- Program . Introduction to astronomy, Special topics, Constellations lecture, Field trip to the observatory, Night observation
- Contact . Department of Physics and Astronomy, College of Natural Sciences

<http://astro.snu.ac.kr> +82-2-880-8159

SUMMER OCEAN SCHOOL



The Research Institute of Oceanography (RIO) runs Summer Ocean School to promote interest in marine science among young students by providing hands-on experience.

- Eligibility . 5th to 8th graders
- Time . August
- Contact . Research Institute of Oceanography, CNS

<http://rio.snu.ac.kr> +82-2-880-6512

RESEARCH HIGHLIGHTS: MEDIA COVERAGE

Media coverage of the scientific accomplishments of our CNS faculty

01

Cryptanalysis of multilinear maps: The best paper of Eurocrypt 2015

Prof. Jung Hee Cheon of the Department of Mathematical Sciences and his students Changmin Lee, Hansol Ryu, and Kyoo Hyung Han published an algorithm analyzing a multilinear map over the integers with Damien Stehle of ENS de Lyon. As a multilinear map is a hot topic in the area of cryptographic research, much research has been conducted. About 90 papers are affected by their algorithm. Especially, about 10 papers turn out to be unsafe. With this accomplishment, they became the first Koreans to win the Best Paper Award at "Eurocrypt 2015", which is one of the most prestigious conferences in the field of cryptography.

• Donga Science Mar. 13, 2015

02

The Story of Big Data

Competition between companies has been becoming fiercer and the importance of new information has received much attention. Apple shock represented by iPhone recently tells us that knowing what consumers want may be more important than new technologies. The information stored via navigation, smartphone, credit card and social networking services is growing rapidly at a rate that has never been seen before, and this is why we call the present the Era of Big Data. Creating new information through the storage, arrangement and analysis of Big Data has become a source of competitiveness in the 21st century. Contributed by Prof. Yongdai Kim, Department of Statistics.

• Chosun Biz Aug. 8, 2013

03

Understanding the Mechanism of Explosive Percolation Transition

Prof. Byungnam Kahng of the Department of Physics and Astronomy (Physics Program) has uncovered the mechanism of explosive percolation transition. When clusters merge and form a macroscopic size cluster under a suppressive environment, the tipping point is delayed and mesoscopic size clusters become abundant. At the tipping point, such medium size clusters merge suddenly, forming a macroscopic size cluster. This mechanism can be used for understanding drastic opinion formations in social affairs and gelation in sol-gel transition.

• The Hankyoreh Mar. 8, 2013

04

Supernova Origin of Phosphorus

Prof. Bon-Chul Koo of the Department of Physics and Astronomy (Astronomy Program) detected a large amount of phosphorus, which is the main component of our DNA and bones, in the young supernova (SN) remnant Cassiopeia A. The detected phosphorus abundance is up to a hundred times higher than those found in other places in our galaxy, including the solar system, but compatible with the predictions of SN nucleosynthetic models. This is the first direct observational evidence for the in situ production of phosphorus in a supernova.

• Yonhap News Agency Apr. 30, 2015

05

Is it possible to overcome Alzheimer's disease?

Degenerative brain diseases, such as Alzheimer's and Parkinson's disease, are partly caused by microglia activation and its subsequent damage to neurons and adjacent cells by toxic cytokines. Microglia represent the endogenous brain defense and immune cells. Prof. Seung Bum Park of the Department of Chemistry reported the discovery of a novel bioactive compound that can selectively inhibit the activation of microglia and confirmed its in vivo efficacy in animal models. His research group identified this chemical entity from phenotype-based high throughput screening and revealed the mechanism of action through the identification of target proteins and the subsequent biophysical/biochemical study for the development of new therapeutics of neurodegenerative diseases.

• Yonhap News Agency Mar. 19, 2014

06

Discovery of ribonuclease that degrades HIV-1 genomic RNA

SAMHD1 has been identified as a regulator of innate immune response and a restriction factor of HIV-1. However, the action mechanism of SAMHD1 for preventing HIV-1 infection remains poorly understood. Prof. Kwangseog Ahn of the Department of Biological Sciences and his colleagues reported that SAMHD1 is a ribonuclease (RNase) that catalyzes the degradation of RNA, and revealed that the RNase activity of SAMHD1 is responsible for HIV-1 inhibition by directly degrading the HIV-1 genomic RNA. These results provide insight into the mechanisms underlying HIV-1 restriction and the development of vaccines against HIV/AIDS.

• The Korea Economic Daily Jul. 21, 2014

07

Investigating the behavior of atmospheric CO₂ with ice cores

Professor Jinho Ahn of the Department of Earth and Environmental Sciences (SEES) at SNU and Professor Ed Brook of Oregon State University analyzed ancient air trapped in the Siple Dome ice core located in Antarctica. They found two modes of atmospheric CO₂ change depend on background boundary conditions in the atmosphere and ocean. This work is of great importance in better understanding current environmental changes and accurately predicting future climate amid the rise of atmospheric greenhouse gases.

• YTN TV Oct. 13, 2014

Faculty Directory

MATHEMATICAL SCIENCES

Name	Position	Graduate Degree Institution	Research Interests	E-mail	Office
Byeon, Dongho	Professor	Pohang Univ. of Science and Technology (Korea)	Algebra(Number Theory)	dhbyeon@snu.ac.kr	27-202
Byun, Sun-Sig	Professor	Univ. of Iowa (USA)	Analysis(PDEs)	byun@snu.ac.kr	27-308
Cheon, Jung Hee	Professor	KAIST (Korea)	Number Theory, Cryptology	jhcheon@snu.ac.kr	27-404
Cho, Cheo-Hyun	Professor	Univ. of Wisconsin, Madison (USA)	Symplectic Topology and Mirror Symmetry	chocheol@snu.ac.kr	27-413
Cho, Young-Hyun	Professor	Northwestern Univ. (USA)	Algebra(Commutative Algebra, Homological Algebra)	youngcho@math.snu.ac.kr	27-305
Choi, Hyeong-In	Professor	Univ. of California, Berkeley (USA)	Differential Geometry, Applied mathematics	hichoi@snu.ac.kr	27-406
Ha, Seung-Yeal	Professor	Stanford Univ. (USA)	Applied Mathematics(Nonlinear PDEs)	syha@snu.ac.kr	27-303
Iliev, Atanas	Professor	Moscow State Univ. (Russia)	Algebraic Geometry	ailiev@snu.ac.kr	27-201
Jeong, Ja A	Professor	Seoul National Univ. (Korea)	Analysis(Operator Algebras)	jaeong@snu.ac.kr	27-207
Kang, Myungjoo	Professor	Univ. of California, Los Angeles (USA)	Applied Mathematics(Numerical Analysis)	mkang@snu.ac.kr	27-409
Keem, Changho	Professor	Brown Univ. (USA)	Algebraic Geometry	ckeem@math.snu.ac.kr	27-310
Kiem, Young-Hoon	Professor	Yale Univ. (USA)	Algebraic Geometry	kiem@snu.ac.kr	27-306
Kim, Hong-Jong	Professor	Univ. of California, Berkeley (USA)	Geometry(Differential Geometry)	hongjong@snu.ac.kr	27-209
Kim, Myung-Hwan	Professor	Ohio State Univ. (USA)	Algebra(Number Theory, Cryptography)	mhkimath@snu.ac.kr	27-205
Kim, Panki	Professor	Univ. of Washington (USA)	Probability	pkim@snu.ac.kr	27-408
Kim, Young One	Professor	Seoul National Univ. (Korea)	Analysis(Functions of a Complex Variable, Symbolic Dynamics)	kimyone@snu.ac.kr	27-401
Kwon, Jae-Hoon	Professor	Seoul National Univ. (Korea)	Representation Theory, Algebraic Combinatorics	jaehoonkw@snu.ac.kr	27-203
Kye, Seung-Hyeok	Professor	Seoul National Univ. (Korea)	Analysis(Functional Analysis)	kye@snu.ac.kr	27-208
Lee, In-Sok	Professor	Yale Univ. (USA)	Algebra(Representation Theory, Cryptography)	isll@snu.ac.kr	27-301
Lee, Ki-Ahm	Professor	New York Univ. (USA)	Analysis(PDEs)	kiahm@snu.ac.kr	27-204
Lee, Sang-Hyuk	Professor	Pohang Univ. of Science and Technology (Korea)	Harmonic Analysis	shklee@snu.ac.kr	27-309
Lee, Woo Young	Professor	Sungkyunkwan Univ. (Korea)	Analysis(Operator Theory)	wylee@snu.ac.kr	27-405
Oh, Byeong-Kweon	Professor	Seoul National Univ. (Korea)	Number Theory	bkoh@snu.ac.kr	27-411
Park, Jongil	Professor	Michigan State Univ. (USA)	Topology(Topology of 4-manifolds)	jjpark@snu.ac.kr	27-410
Sheen, Dongwoo	Professor	Purdue Univ. (USA)	Applied Mathematics (Numerical Analysis, Inverse Problems)	sheen@snu.ac.kr	27-312
Hong, Jin	Associate Professor	Seoul National Univ. (Korea)	Algebra (Cryptography)	jinhong@snu.ac.kr	27-407
Hyeon, David Donghoon	Associate Professor	Univ. of Illinois at Urbana-Champaign (USA)	Algebraic geometry	dhyeon@snu.ac.kr	27-403
Kang, Nam-Gyu	Associate Professor	Yale Univ. (USA)	Analysis(Complex Analysis, Probability)	nkang@snu.ac.kr	27-307
Kim, Dano	Associate Professor	Princeton Univ. (USA)	Algebraic Geometry, Complex Geometry	kimdano@snu.ac.kr	27-304
Kim, Sang-hyun	Associate Professor	Yale Univ. (USA)	Topology, Geometric group theory	s.kim@snu.ac.kr	27-414
Kook, Woong	Associate Professor	Stanford Univ. (USA)	Combinatorial Mathematics, Algebraic Topology	woongkook@snu.ac.kr	27-210
Lee, Hun Hee	Associate Professor	KAIST (Korea)	Analysis(Operator Algebra, Abstract Harmonic Analysis)	hunheelee@snu.ac.kr	27-313
Lim, Seon Hee	Associate Professor	Yale Univ. (USA)	Topology(Geometric Group Theory, Lie Groups and Ergodic Theory)	slim@snu.ac.kr	27-412
Trutnau, Gerald	Associate Professor	Univ. of Bielefeld (Germany)	Analysis(Stochastic Analysis)	trutnau@snu.ac.kr	27-206
Van Koert, Otto	Associate Professor	Univ. of Cologne (Germany)	Contact Topology	okoert@snu.ac.kr	27-402
Ponge, Raphael	Assistant Professor	Univ. of Paris 11-Orsay (France)	Noncommutative Geometry and Global Analysis	ponge@snu.ac.kr	27-314

STATISTICS

Name	Position	Graduate Degree Institution	Research Interests	E-mail	Office
Cho, Sinsup	Professor	Univ. of Wisconsin, Madison (USA)	Time Series Analysis	sinsup@snu.ac.kr	25-316
Kim, Yongdai	Professor	Ohio State Univ. (USA)	Machine Learning, Survival Analysis, Bayesian Statistics	ydlim@stats.snu.ac.kr	25-327
Lee, Jaeyong	Professor	Purdue Univ. (USA)	Bayesian Statistics	leej@stats.snu.ac.kr	25-314
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Lee, Youngjo	Professor	Iowa State Univ. (USA)	Hierarchical Generalized Linear Models	youngjo@snu.ac.kr	25-326
Lim, Johan	Professor	Stanford Univ. (USA)	Order Statistics, Multivariate Statistics	johanlim@snu.ac.kr	25-434
Oh, Hee-Seok	Professor	Texas A&M Univ. (USA)	Multiscale Methods In Statistics, Spatio-Temporal Data Analysis	heeseok@stats.snu.ac.kr	25-436
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Park, Byeong Uk	Professor	Univ. of California, Berkeley (USA)	Non-Parametric Inference, Functional Data Analysis, High-Dimensional Models	bupark@stats.snu.ac.kr	25-332

Appendix

Faculty Directory

Campus Map

Campus Map



- | | |
|--|---|
| ① Physics and Astronomy
①-A (Bldg. 19), ①-B (Bldg. 22),
①-C (Bldg. 23), ①-D (Bldg. 56) | ⑩ Chemistry; Biological Sciences
(Bldg. 502) |
| ② Earth and Environmental Sciences
②-A (Bldg. 24), ②-B (Bldg. 25-1) | ⑪ Chemistry (Bldg. 503) |
| ③ Statistics(Bldg. 25) | ⑫ Biological Sciences (Bldg. 504) |
| ④ Sciences Lecture Building
-> (Bldg. 26) | ⑬ SNU Optical Astronomical
Observatory No.2 (Bldg. 45) |
| ⑤ Mathematical Sciences (Bldg. 27) | ⑭ SNU Optical Astronomical
Observatory No.1 (Bldg. 46) |
| ⑥ Sciences Lecture Building (Bldg. 28) | ⑮ Atmospheric Environmental
Observatory (Bldg. 47) |
| ⑦ Sangsan Mathematical Science
Building (Bldg. 129) | ⑯ Seismological Observatory
(Bldg. 48) |
| ⑧ Brain and Cognitive Sciences;
Biophysics and Chemical Biology
(Bldg. 203) | ⑰ Radio Astronomical
Observatory (Bldg. 48-1) |
| ⑨ Administrative Office; Earth and
Environmental Sciences(Bldg. 501) | ⑱ Main Gate |

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