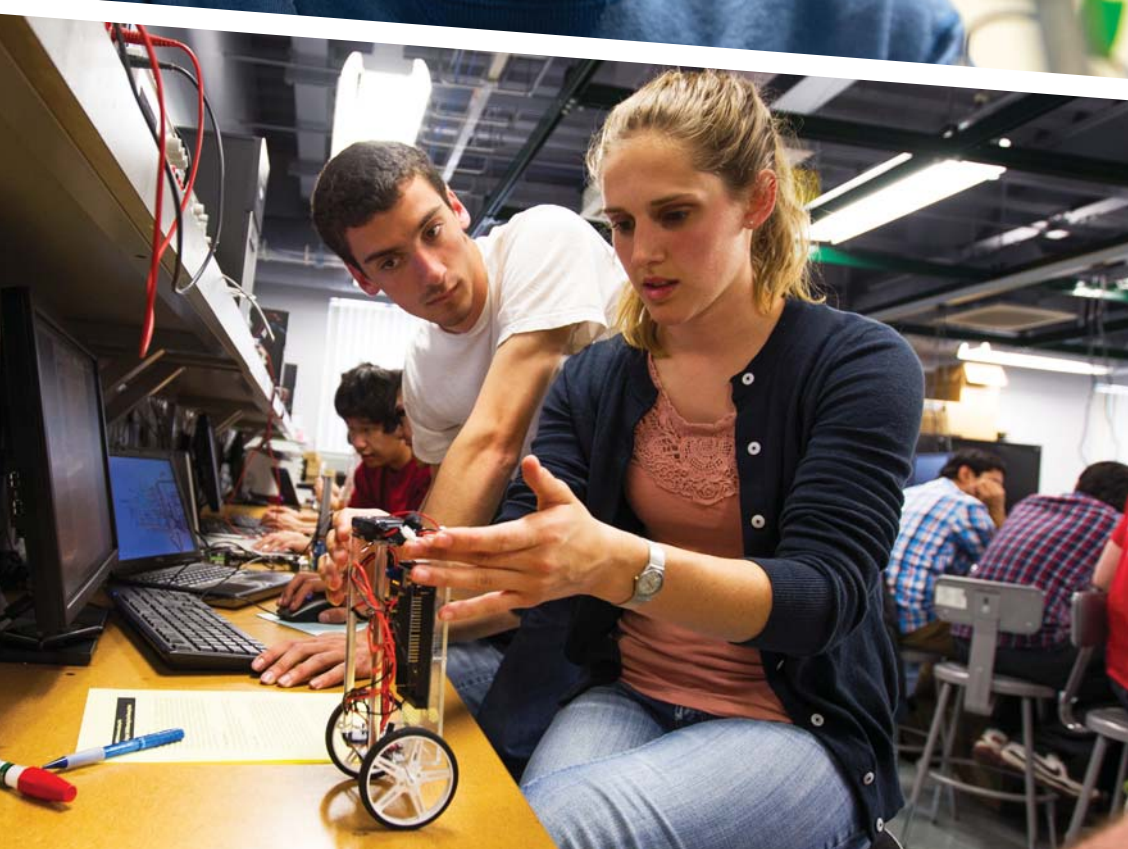
SCIENCE AND ENGINEERING

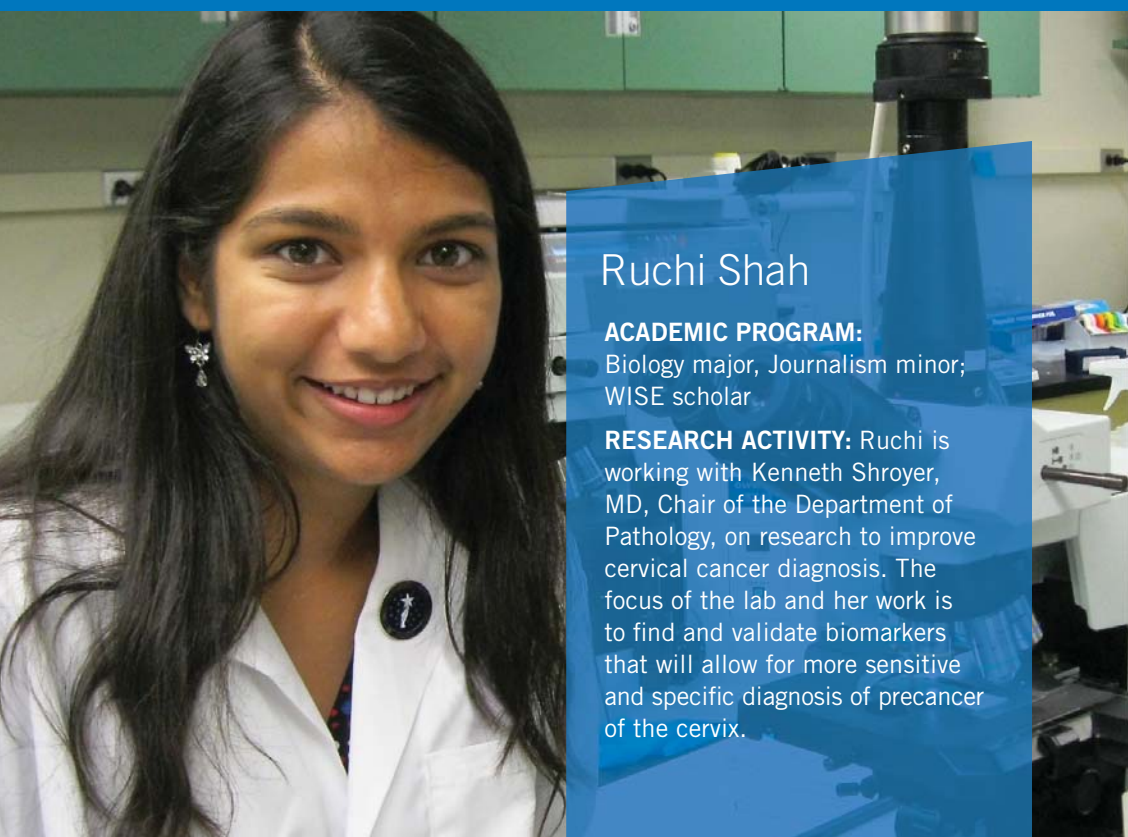
Stony Brook University



One of just 62 members
of the prestigious Association of American Universities

More than
1,900 inventions
and more than
550 patents
by Stony Brook faculty

“Research allows me to delve deeper into the mysteries of science and gives me a new appreciation for the complexity and wonders of the human body and natural world.”



Ruchi Shah

ACADEMIC PROGRAM:
Biology major, Journalism minor; WISE scholar

RESEARCH ACTIVITY: Ruchi is working with Kenneth Shroyer, MD, Chair of the Department of Pathology, on research to improve cervical cancer diagnosis. The focus of the lab and her work is to find and validate biomarkers that will allow for more sensitive and specific diagnosis of precancer of the cervix.

The Joy of Scientific Discovery

Whether your interests lie in the physical sciences, marine or atmospheric sciences, health sciences, planetary studies, engineering, environmental studies, life sciences or other areas, you can explore them at Stony Brook University. We have the facilities, the opportunities, and most important, the people to help you make your own discoveries.

Why Choose Stony Brook?

SCIENCE, SCIENCE AND MORE SCIENCE We offer a wide variety of undergraduate programs — majors, minors and combined-degree programs — with applications in the real world.

HANDS-ON RESEARCH Outstanding opportunities exist at nearby Brookhaven National Lab and through our Undergraduate Research and Creative Activities (URECA) program.

PRIZE-WINNING PROFESSORS Our faculty have won the Nobel and Pulitzer Prizes, MacArthur Fellowship, Fields Medal and Abel Prize in Mathematics, and National Medal of Science.

TOP-NOTCH FACILITIES Research facilities on campus include the Center of Excellence in Wireless and Information Technology and the Advanced Energy Research and Technology Center at our Research and Development Park, Stony Brook University Hospital, and the Centers for Molecular Medicine and Biology Learning Laboratories.

AN INTERDISCIPLINARY APPROACH Concentrate in environmental chemistry, computer-human interaction, neuroscience, engineering geology and other areas.

SMALL UNDERGRADUATE COLLEGES All freshmen belong to one of six themed Undergraduate Colleges featuring small first-year seminars and close connections to faculty.

AFFORDABLE EXCELLENCE Stony Brook is one of the 30 best values in public colleges, according to *Kiplinger*.

On the cover: Science and engineering happens in a chemistry lab (top) and in the Rockwell Automation Anorad Mechatronics Laboratory, Department of Mechanical Engineering, in Stony Brook's College of Engineering and Applied Sciences.

Cover photos by FJ Gaylor Photography

About Undergraduate Research at Stony Brook

All Stony Brook undergraduates, including freshmen and transfer students, are eligible to participate in independent research through our award-winning Undergraduate Research and Creative Activities (URECA) program.

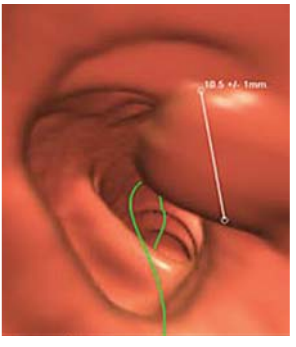
Through the program you will connect with a faculty mentor to do independent research in your area of interest. In the spring you will have an opportunity to showcase your project at a Celebration of Undergraduate Research and Creativity.

As an undergraduate on a research team with graduate students and faculty, you can expect to be treated as an equal. The high level of mentored scientific scholarship at Stony Brook is evidenced by the fact that each year about 10 percent of the 300 semifinalists in the Intel Science Talent Search competition are mentored by Stony Brook faculty.

Programs that URECA administers to support student research include the Battelle Summer Research Program, the Beckman Scholars Program, Research Experiences for Undergraduates (REU) Site Programs, Howard Hughes Medical Institute (HHMI) Undergraduate Research Programs, and the URECA Summer Research and Small Grant/Travel Grant Programs.

You can learn more about URECA and read interviews with our Researchers of the Month at **stonybrook.edu/ureca**

Discovered at Stony Brook



- In collaboration with other scientists, evidence to link the skull of *Homo floresiensis*, a hobbit-like 17,000-year-old hominid, to an extinct human species
- The MRI technology that won the Nobel Prize for Medicine
- Research and development of bar-code technology
- New nanotechnology to trap bedbugs
- A 10-pound ancient frog in Madagascar, possibly the largest ever to exist
- ReoPro®, used in cardiac angioplasties
- Patented diagnostic 3D imaging software and a computer system for 3D virtual colonoscopy
- Commingled thermoplastic spray paint made from old plastic bottles
- A new species of mouse lemur (*Microcebus mittermeieri*), the smallest primate in the world
- XIAFLEX®, for the treatment of adults with Dupuytren's contracture
- A new way to image the brain's glymphatic pathway to clear waste that might contribute to the development of Alzheimer's

Connor Beierle

ACADEMIC PROGRAM:
Mechanical Engineering, College of Engineering and Applied Sciences

RESEARCH ACTIVITY: Connor has had two internships with NASA, one in the aeromechanics branch of the flight vehicle research and technology division at Moffett Field in California, the second in the power systems engineering branch at NASA's Glenn Research Center in Ohio.

"It's very exciting to see that the work I contributed to has real-world ramifications."

"The rooftop farm is like a playground to do research related to sustainability and organic agriculture."

Amy Stofenberg

ACADEMIC PROGRAM:
Ecosystems and Human Impact major

RESEARCH ACTIVITY: With mentor James Hoffman, professor in the Department of Sustainability Studies, Amy grows radishes in Stony Brook's organic rooftop farm in an experiment designed to test the quality and effectiveness of University-made compost.

Tyler Abruzzo

ACADEMIC PROGRAM: Combined-degree program leading to BS Marine Science/MS Marine and Atmospheric Sciences

RESEARCH ACTIVITY: Tyler does research in fisheries biology at the Southampton campus and on the Carmans River and nearby Atlantic Ocean from the decks of Stony Brook's research vessels with Michael Frisk, professor in the School of Marine and Atmospheric Sciences.

"Hauling in nets, identifying fish and being on a boat in rain or shine are exhilarating. The best part is knowing that you're making a difference."

Programs of Note

WOMEN IN SCIENCE AND ENGINEERING (WISE) Supports women talented in science, mathematics and engineering.

HONORS COLLEGE Special curriculum of interdisciplinary courses for high achievers that supplements studies in any major.

SCHOLARS FOR MEDICINE, SCHOLARS FOR DENTAL MEDICINE AND ENGINEERING SCHOLARS FOR MEDICINE Eight-year combined undergraduate and medical/dental degree tracks within the Honors College, WISE and the College of Engineering and Applied Sciences that guarantee entrance into the School of Medicine or the School of Dental Medicine.

Julian Hassinger

ACADEMIC PROGRAM:
Physics and Math major

RESEARCH ACTIVITY: Julian conducts research in a condensed matter laboratory at Brookhaven National Laboratory with Meigan Aronson, a professor in the Department of Physics and Astronomy, synthesizing new materials as part of a search for high-temperature superconductors.

"My favorite part is researching something going on in the real world. Some of the materials we're growing in the lab at BNL have never been grown before."

UNIVERSITY SCHOLARS Community of learners focused around our three pillars of leadership, scholarship and service.

HONORS PROGRAM IN COMPUTER SCIENCE Advanced courses in select topics and preferential admission to the joint BS/MS program in Computer Science.

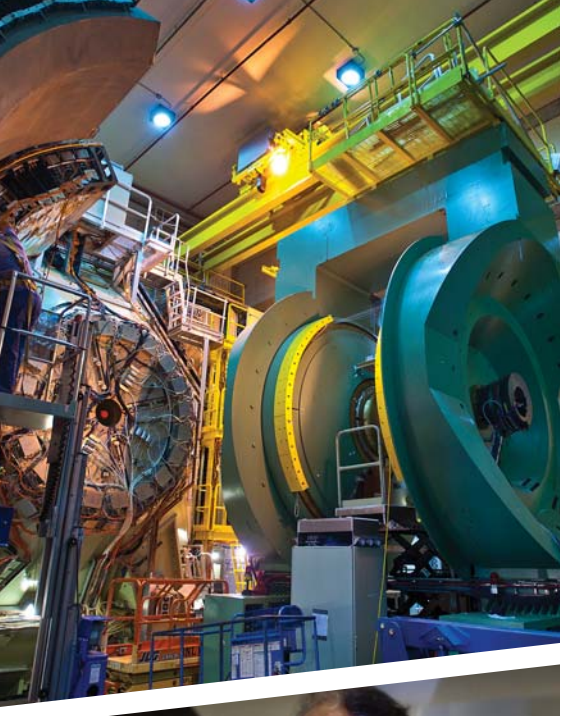
COLLEGE OF ENGINEERING AND APPLIED SCIENCES Seven ABET-accredited programs that prepare students for work or graduate study in traditional or new interdisciplinary fields.

SCHOOL OF MARINE AND ATMOSPHERIC SCIENCES One of the world's leading coastal oceanography institutions. The School is also the focus for the study of atmospheric sciences and meteorology.

MERIT SCHOLARSHIPS Students admitted to WISE, the Honors College, Scholars for Medicine, Scholars for Dental Medicine and Engineering Scholars for Medicine receive scholarship support for one to four years. All Intel Science Talent Search and National Merit Finalists and Semifinalists receive scholarship support ranging from partial tuition to full scholarship.

Learn more at **stonybrook.edu/scholars**

OTHER PROGRAMS Howard Hughes Medical Institute Undergraduate Research Fellowship Program; interdisciplinary research opportunities through The Center for Biotechnology; and unique study abroad research opportunities in locations such as Kenya, Madagascar and Jamaica.



About Brookhaven National Laboratory

A multipurpose research laboratory funded primarily by the U.S. Department of Energy, Brookhaven National Laboratory (BNL) is located on 5,300 acres less than 20 miles east of the Stony Brook campus. BNL operates large-scale facilities for studies in physics, chemistry, biology, medicine, applied science and advanced technology.

Established in 1947, BNL is the home of seven Nobel Prize-winning discoveries — five for research in physics. Each year more than 5,000 visiting researchers from around the world join BNL's 3,000 scientists, engineers and support staff. Stony Brook is BNL's largest single user, with more than 600 faculty, students and staff participating in groundbreaking research at Brookhaven.

BNL scientists are expanding our understanding of the properties and function of matter from the microscopic to the cosmic scales. At the Relativistic Heavy Ion Collider (RHIC) — the world's newest and biggest particle accelerator for nuclear physics — scientists replicate conditions microseconds after the Big Bang to better understand subatomic particles and their interactions. At the Center for Functional Nanomaterials (CFN), scientists are probing the unique properties of matter at the nanoscale with the aim of developing new materials to help solve our nation's energy challenges. And at the National Synchrotron Light Source (NSLS), researchers are probing the inner workings of proteins, superconductors and magnets in ways that may lead to a wide range of benefits for humankind.

BROOKHAVEN
NATIONAL LABORATORY

Research Highlights at BNL

LIGHTING UP DISCOVERIES A source of intense beams of x-rays and ultraviolet light, the NSLS has been used to decipher the molecular structures of proteins and viruses, to construct micromachines, and to study magnetism and superconductivity. Work at the NSLS led to Nobel Prizes in 2003 and 2009.

LIQUID UNIVERSE RHIC's finding that the early universe behaves more like a liquid than a gas has enriched physicists' understanding of the theory that describes the interactions of the smallest known components of matter.

MEDICAL MARVELS Using positron emission tomography, scientists probe the brain chemistry of addiction, mental illness and aging, and have been finding effective treatments for a variety of diseases.

WORLD-CLASS COMPUTING Stony Brook and BNL have joined forces to move toward the frontier of high-performance computing. Enabled by an anonymous major donation, SBU has established the Institute for Advanced Computational Science. The Institute's founding director, Professor Robert Harrison, also heads the Center for Computational Science at BNL. Under his leadership, both centers will push SBU and BNL capability toward exascale computing (a billion times a billion computations per second). Together scientists from SBU and BNL use the supercomputers installed at BNL and smaller advanced computing clusters at SBU to address the most complex problems in the physical sciences, environmental and climate science, the life sciences and medicine, industry and finance.

ENERGY ALTERNATIVES BNL conducts research in biofuels, solar energy, nuclear energy, and energy efficiency and storage.

INVESTIGATING THE ULTRASMALL CFN provides researchers with state-of-the-art tools to fabricate and study nanomaterials, which could lead to new technologies.

CLIMATE CHANGE BNL scientists study the effects of aerosol particles, greenhouse gases and other air pollutants on global climate, plant growth and human health.

NUCLEAR SAFETY BNL's nuclear science experts participate in international efforts to safeguard nuclear materials, limit the spread of nuclear weapons and improve the safety of nuclear reactors worldwide.

Learn more about the facilities and accomplishments of BNL at **www.bnl.gov**

BNL for Undergraduates

Brookhaven National Laboratory offers outstanding research opportunities for students in physics, material sciences, environmental studies, biology, chemistry, engineering and other areas. BNL offers qualified students:

- research opportunities with the world's top scientists
- internships during the academic year and the summer
- shuttle service to BNL from the Stony Brook campus
- internships for students in the Women in Science and Engineering (WISE) program
- undergraduate scholarships through the Homeland Scholars and Fellows Program
- one-week mini-semesters during winter break

Learn more about BNL's undergraduate research opportunities at **stonybrook.edu/bnl**

The Sciences: Rigorous. Focused. Interdisciplinary.

SCIENCE MAJORS

APPLIED MATHEMATICS & STATISTICS, BS, BS/MS

ASTRONOMY/PLANETARY SCIENCES, BS*

ATHLETIC TRAINING, BS

ATMOSPHERIC & OCEANIC SCIENCES, BS
with tracks in Atmosphere/Ocean, Meteorology

BIOCHEMISTRY, BS*

BIOLOGY, BS*
with specializations in Developmental Genetics, Ecology & Evolution, Biomedical Engineering, Environmental Biology, General Biology, Neuroscience

BIOMEDICAL ENGINEERING, BE
with specializations in Bioelectricity and Bioimaging, Biomechanics and Biomaterials, Molecular & Cellular Biomedical Engineering

CHEMICAL & MOLECULAR ENGINEERING, BE
with specializations in Pharmacology, Materials Science, Polymer Science, Tissue Engineering, Business, Chemistry, Physics

CHEMISTRY, BS, BA*
with options in Biological Chemistry, Chemical Physics, Chemical Science, Environmental Chemistry, Marine & Atmospheric Chemistry

CIVIL ENGINEERING, BE

CLINICAL LABORATORY SCIENCES, BS

COASTAL ENVIRONMENTAL STUDIES, BS

COMPUTER ENGINEERING, BE

COMPUTER SCIENCE, BS*
with specializations in Computer-Human Interaction, Information Assurance, Game Programming

EARTH & SPACE SCIENCES, BA
with concentrations in Astronomy, Atmospheric Sciences, Biology, Chemistry, Geology, Marine Sciences, Mathematics, Physics

ECOSYSTEMS & HUMAN IMPACT, BA

ELECTRICAL ENGINEERING, BE
with specializations in General Electrical Engineering, Microelectronics, Telecommunications

ENGINEERING CHEMISTRY, BS

ENGINEERING SCIENCE, BE
with specializations in Biomedical Engineering, Civil & Environmental Engineering, Electrical Engineering, Materials Science & Engineering, Mechanical & Manufacturing Engineering, Nanoscale Engineering, Engineering Management

ENVIRONMENTAL DESIGN, POLICY & PLANNING, BA

ENVIRONMENTAL STUDIES, BA*
with concentrations in Archaeology, Atmospheric Studies, Conservation/Physical Anthropology, Ecology, Environmental Economics, Environmental History, Environmental Law, Marine Environmental Studies, Public Policy, Waste Reduction & Management

GEOLOGY, BS*
with clusters in Environmental Geoscience, Geological Oceanography, Geology

HEALTH SCIENCE, BS
with concentrations in Healthcare Management, Community Health Education, Public Health, Healthcare Informatics, Environmental Health, Medical Billing & Coding, Pharmacy Technician, Medical Dosimetry, Anesthesiology Technology, Disability Studies, Emergency and Disaster Management, EMT-Paramedic, Nuclear Technology

HUMAN EVOLUTIONARY BIOLOGY, BS

INFORMATION SYSTEMS, BS
with specializations in Natural Science, Engineering, Applied Science, Environmental Studies

MARINE SCIENCES, BS*

MARINE VERTEBRATE BIOLOGY, BS

MATHEMATICS, BS*

MECHANICAL ENGINEERING, BE

NURSING, BS

PHARMACOLOGY, BS*

PHYSICS, BS*

PSYCHOLOGY, BS*

RESPIRATORY CARE, BS

SUSTAINABILITY STUDIES, BA

TECHNOLOGICAL SYSTEMS MANAGEMENT, BS
with specializations in Natural Science, Engineering, Applied Science, Environmental Studies

* Majors offering Honors Programs

SCIENCE MINORS

ADAPTED AQUATICS

APPLIED MATHEMATICS & STATISTICS

ASTRONOMY/PLANETARY SCIENCES

BIOENGINEERING

BIOLOGY

BIOMATERIALS

CHEMISTRY

COASTAL ENVIRONMENTAL STUDIES

COMPUTER SCIENCE

ECOSYSTEMS & HUMAN IMPACT

ELECTRICAL ENGINEERING

ELECTRONIC, OPTICAL & MAGNETIC MATERIALS

ENGINEERING & TECHNOLOGY ENTREPRENEURSHIP

ENVIRONMENTAL DESIGN, POLICY & PLANNING

ENVIRONMENTAL ENGINEERING

ENVIRONMENTAL STUDIES

GEOLOGY

GEOSPATIAL STUDIES

HEALTH & WELLNESS

INFORMATION SYSTEMS

MANUFACTURING ENGINEERING

MARINE SCIENCES

MATERIALS SCIENCE

MATHEMATICS

MECHANICAL ENGINEERING

NANOTECHNOLOGY STUDIES

OPTICS

PHYSICAL METALLURGY

PHYSICS

SUSTAINABILITY STUDIES

TECHNOLOGICAL SYSTEMS MANAGEMENT

SECONDARY TEACHER EDUCATION PROGRAMS IN THE SCIENCES

BIOLOGY
CHEMISTRY
EARTH SCIENCE
MATHEMATICS
PHYSICS

SEQUENTIAL AND COMBINED BACHELOR'S/MASTER'S DEGREE PROGRAMS IN THE SCIENCES

APPLIED MATHEMATICS & STATISTICS, BS/MS, BS/MPH

BIOCHEMISTRY, BS/CHEMISTRY, MS

BIOMEDICAL ENGINEERING, BE/MS

BUSINESS BS/MBA, BA/MBA, BE/MBA

CHEMISTRY, BS/MS, BS/MAT

COMPUTER ENGINEERING, BE/MS; BE/ELECTRICAL ENGINEERING, MS

COMPUTER SCIENCE, BS/MS

EARTH SCIENCE, BA/MAT

EARTH & SPACE SCIENCES, BA/MPH

ELECTRICAL ENGINEERING, BE/MS; BE/COMPUTER ENGINEERING, MS

ENGINEERING CHEMISTRY, BS/CHEMISTRY, MS; BS/MATERIALS SCIENCE, MS

ENGINEERING SCIENCE, BE/MATERIALS SCIENCE, MS

HEALTH SCIENCE, BS/OCCUPATIONAL THERAPY, MS

MARINE SCIENCES, BS/ATMOSPHERIC SCIENCE, MS

MARINE SCIENCE BIOLOGY, BS/MBA

MARINE VERTEBRATE BIOLOGY, BS/MBA

MATHEMATICS, BS/MAT

MECHANICAL ENGINEERING, BE/MS

PHARMACOLOGY, BS/MPH

PHYSICS, BS/MS, BS/MAT

TECHNOLOGICAL SYSTEMS MANAGEMENT, BS/MS

Visit **stonybrook.edu/admissions** to find out about all our majors and minors.

Location

We are located on the North Shore of Long Island in southeastern New York, approximately 60 miles east of New York City and only 20 miles from Brookhaven National Laboratory. With a Long Island Rail Road station on campus, traveling to New York City and JFK Airport is easy. Come visit us for a campus tour.

Apply online at **stonybrook.edu/admissions**
Priority application deadline: **January 15**
Notification by: **April 1**

For more information

Contact us at:

Office of Undergraduate Admissions
Stony Brook University
118 Administration Building
Stony Brook, NY 11794-1901

(631) 632-6868

Email: *enroll@stonybrook.edu*

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— Center for World University Rankings

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