

# SBU Happenings

[HOME](#)[FACULTY/STAFF HIGHLIGHTS](#)[RESEARCH](#)[ARTS & ENTERTAINMENT](#)[ON CAMPUS](#)[MEDICINE](#)[ALUMNI & FRIENDS](#)

## Garcia Research Scholar Program Gives High School Students a Glimpse into Everyday Life of a Scientist

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ON CAMPUS, RESEARCH, STUDENT SPOTLIGHT

Nanotechnology and 3D printing are heady research topics — the kind that are making our lives easier, safer or less costly — and they are just two of the topics being tackled by high school students from all over the country as part of the Garcia Center for Polymers at Engineered Interfaces – Research Scholar Program. The students unveiled their findings at Stony Brook University on August 12 at the Garcia Research Scholar Program's annual summer symposium.

Many of the students at the symposium, held in the Student Activities Center, were mentored by Stony Brook professors, graduate students and undergraduate students. Competition for placement in the high school program is fierce, with more than 300 students applying for 60 research slots. Forty-eight percent of those applicants are from Long Island.

The cutting-edge research is funded in part by an INSPIRE (Integrated Support Promoting Interdisciplinary Research and Education) grant from the National Science Foundation, industry contracts through the Center for Advanced Technology in Sensors, and the Morin Foundation Trust.

Stony Brook's Garcia Research Scholar Program is a collaboration among academic, industrial and government laboratories, and offers the opportunity for high school teachers and students to perform research at the forefront of polymer science and technology alongside Garcia Center faculty and staff. Students who are accepted into the seven-week program live in Stony Brook's residence halls during the summer. Working together on topics of mutual interest, they become members of highly focused research teams with the goal of making contributions of interest to the scientific community. Some even have the opportunity to work with top-tier research teacher Terrence Bissoondial of the George W. Hewlett High School Research Program. Bissoondial has mentored the Siemens grand prize winners for the past two years, helping them land hefty scholarships for their research in math, science and technology.

Miriam Rafailovich and Jonathon Sokolov, both professors in the Department of Materials Science and Engineering, have directed the Garcia Center, which was established in 1996, for more than a decade.

The Garcia students' research is tied to polymers, which are essentially a long chain of molecules produced by joining together many smaller units and can be used in such applications as creating artificial skin, engineering heart valves and solar energy technology and making hydrogen fuel cells.

Rafailovich and her graduate students collaborate with scientists from other departments, such as Dennis Galanakis, MD, associate professor of Pathology and Medicine and director of the Stony Brook Blood Bank; Marcia Simon, a molecular biologist, professor and director for Graduate Studies in the Department of Oral Biology and Pathology and director of the Living Skin Bank; Stephen Walker, a microbiologist and associate professor in the Department of Oral Biology and Pathology in the School of Dental Medicine; and Peter Brink, chair of the Department of Physiology and Biophysics.

One of the student research projects dealt with three-dimensional printing, which can eliminate the wait for a crown or a cap for a dental patient. "Prosthetics can also be made to specifications," said Rafailovich.

The Garcia Center and the high school students collaborated with numerous industries, such as Israel Chemicals Limited to develop flame retardant and environmentally safe materials, and Bedbug LLC to apply nanotechnology — which deals with a world so tiny it can't be seen with a light microscope — to develop insect traps that do not introduce chemical toxins into the environment.

Clement Marmorat is a Stony Brook graduate student who had the opportunity to mentor several groups of the program's high school students and guide them through experiments that relate to his thesis, which examines networks of polymer chains known as hydrogels, a material that gives structural support to cells used in tissue engineering.

"The Garcia Summer Program gives students an idea of the everyday life of a scientist, including their struggles and successes," said Marmorat. "Some of the alumni of the program pursued careers in science and research and credited the Garcia program with helping them develop their research interests and transition in science careers. I am one of them."

Marmorat participated in the Garcia program during the summer of 2012, when he was an exchange student completing a master's degree in Nantes, France. "After a brief time working in the industry, I returned to Stony Brook and entered the PhD program in materials science under the advisement of Dr. Rafailovich," he said. "The devotion and tireless work of the faculty at Stony Brook made me want to come back. It's my pleasure to now be on the other side of the fence and give back to the program."

Visit [polymer.matscieng.sunysb.edu/srprog.html](http://polymer.matscieng.sunysb.edu/srprog.html) for information on how to apply to the Garcia Center Research Scholar Program in 2015.



Left to right: Garcia students Josh Goldstein, Daniel Foreman, Gurkirat Singh (SBU undergrad) Steven Krim (SBU undergrad), Wanying Fu, Pierre Max Etienne