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NSF

new york city alliance
NEWS

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NYC Alliance Enters Twenty Years of Activities Across CUNY

The NSF supported New York City Louis Stokes Alliance for Minority Participation (LSAMP) at CUNY has, since its inception in November 1992, been at the forefront of a concentrated effort to substantially increase the number of underrepresented minority students (African-Americans, Hispanics, Native Americans and Native Pacific Islanders), who pursue and graduate with Baccalaureate Degrees in Science, Technology, Engineering and Mathematics (STEM). Since its inception in November 1992 over 12,000 baccalaureate degrees have been awarded to underrepresented minority students in CUNY.

Collaborating with faculty and administrators across CUNY to restructure Gatekeeper Courses and the establishment/augmentation of Learning Centers created the foundations for increasing enrollment and subsequent graduation of students in the STEM disciplines.

As we enter our twentieth year of operation in the City University of New York, Alliance programs now involve student support via research assistantships to undergraduate and graduate students, a Bridge to the Doctorate program, the Integrated Research Strategies program for faculty, an International Research Program, collaborations with Federal agencies such as (Brookhaven National Lab and NASA) and Centers/Institutes.

Strong institutional support from the Central CUNY Administration, the participating CUNY campuses, and a collaborative spirit at the Steering Committee level over two decades were critical elements of program success.

We thank you for the efforts with the NYC Alliance, and look forward to working with you in the upcoming years.

Neville A. Parker, Ph.D., P.E.
Herbert G. Kayser Professor of Civil Engineering
NYC LSAMP Principal Investigator/Project Director

Hunter Alumna Wins NSF Graduate Research Fellowship

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Lina Mercedes Gonzalez, '09, who is currently pursuing a PhD in mechanical engineering at Carnegie Mellon University, has been awarded a National Science Foundation Graduate Research Fellowship. The Fellowship recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering and mathematics disciplines who are pursuing research-based master's and doctoral degrees at accredited US institutions.

Gonzalez's research is part of a broad quest to deliver drugs to the specific site where they're needed. The NSF granted her $90,000 over three years to work on a "swimmer" drug-delivery vehicle. The swimmer – measured in micrometers (hundredths of a centimeter) – is made of polydimethylsiloxane, or PDMS, a silicon-based organic polymer that's used in everything from contact lenses to shampoos. Call it a nanobot, a tiny robot that can be injected into the body to perform medical procedures.

To work, the swimmer needs two systems – guidance and propulsion.

For guidance, Gonzalez turns to infinitesimally small magnetic particles that are naturally manufactured by magnetotactic bacteria. She extracts these particles and inserts them into the swimmer. Once the swimmer is in the body, it can be guided by external magnets.

For propulsion, she is working on a "pea whistle" system that's roughly analogous to a basketball coach's whistle; when it's blown, air is forced into a chamber and exits through a slot; a "pea" bounces in the chamber, producing a warbling sound. Gonzalez said that in the swimmer, a microscale pressure tank will do the blowing and provide the propulsion. (Other researchers take a different tack to nanobot propulsion, trying to emulate flagella, the tail-like parts of many types of cells.)

Gonzalez conducts her research with Carnegie Mellon professor Philip R. LeDuc and professor William C. Messner, who are collaborating on ways to probe cellular mechanics using microfluidics, mechanatronics and control theory.

Gonzalez, who expects to earn her doctorate within three years, intends to become a professor with her own lab. "The math, physics and chemistry I took at Hunter have helped a lot," she said. She particularly credits Hunter physics professor Steven G. Greenbaum "for guiding me throughout my undergraduate career." Among other things, he encouraged her to twice work at Caltech, where she "interacted with mechanical engineers and bioengineers, and that helped me make a decision to pursue a career as a mechanical engineer."

Alfred P. Sloan Foundation Supports CUNY's Decade of Science; $1M Grant will Support Early-Career Scientists *Reprinted with permission of CUNY*

The City University of New York has received a three-year, $1,075,968 grant from the Alfred P. Sloan Foundation to encourage and support promising early-career scientists. Promoting Scientific Success at CUNY will fund two initiatives: a summer undergraduate research program and a junior faculty fellowship program.

Chancellor Matthew Goldstein said the grant, made during CUNY's ongoing Decade of Science, reflects the University's priority on research in science, technology, engineering, and mathematics (STEM).

"We're pleased that the Sloan Foundation has recognized CUNY's role in promoting scientific research," he said. "This is an exciting opportunity because the grants will enhance the stature of the University by giving our students and faculty a competitive advantage in these vital fields."

"We're delighted to partner with the Sloan Foundation to spearhead a cohort of new scientists," said Gillian Small, vice chancellor for research and principal investigator. "This will provide CUNY's researchers with a means to excel and will accelerate their road to success."

Paula Olsiewski, program director of the Alfred P. Sloan Foundation, said, "CUNY's innovative program is taking a leadership role in advancing science at the highest levels by encouraging young people, particularly women and minorities, to study in these disciplines."

Each year, the 10 undergraduates selected for the 10-week summer training and mentoring program will receive a $3,500 stipend and free housing enabling the scientists to gain practical laboratory experience. "This is open to all qualified CUNY students interested in doing applied research in the STEM fields," Small said. "The Sloan Foundation's support provides a unique opportunity for undergraduates and will increase the likelihood that they will continue their research work in graduate school and beyond."

The students will work under the supervision of CUNY research faculty mentors in labs across the University. They will attend workshops and seminars on scientific and professional development topics and design and carry out research projects.

Each junior faculty member chosen for the fellowship program for young science and engineering scholars will receive a $50,000 award. Three will be awarded the first year, four the second and five the third.

"The grants will advance their careers by providing structured support that enables them to devote concerted attention to research projects that have significant potential scientific, economic and societal impact," Small said.

The accomplishments of the CUNY students and faculty will be tracked and compared with those of their peers.

"Promoting Scientific Success at CUNY will invest in the young researchers of today to grow the innovation economy of tomorrow," Small said. "We hope to train a new generation of researcher-entrepreneurs to create a pipeline of students interested in emerging science disciplines and pro-vide early-career STEM scholars with the means to create new knowledge and succeed at a level that might otherwise have been unobtainable."

The Alfred P. Sloan Foundation is a philanthropic, nonprofit grant-making institution based in New York City. Established in 1934 by Alfred Pritchard Sloan Jr., then-president and CEO of General Motors Corp., the Foundation's grants support original research and education in science, technology, engineering, math, and economic performance. www.sloan.org.

The City University of New York is the nation's leading urban public university. Founded in New York City in 1847 as The Free Academy, the University has 23 institutions: 11 senior colleges, six community colleges, the William E. Macaulay Honors College at CUNY, the Graduate School and University Center, the CUNY Graduate School of Journalism, the CUNY School of Law, the CUNY School of Professional Studies and the CUNY School of Public Health. The University serves 260,000 academic credit students and 269,808 adult, continuing and professional education students. College Now, the University's academic enrichment program for 32,500 high school students, is offered at CUNY campuses and more than 300 high schools throughout the five boroughs of New York City. The University offers online baccalaureate degrees through the School of Professional Studies and an individualized baccalaureate through the CUNY Baccalaureate Degree. More than 1 million visitors and 2 million page views are served each month by www.cuny.edu, the University's website.

CUNY LSAMP Summer Intern Research Summit

Thursday, July 28, 2011
New York City College of Technology

Comments and aspects of the summer program that were highly rated by the students:

- interactions with the graduate student
- writing feedback from the graduate students was found useful
- liked the presentation of diversity of research from other participants
- improved presentation skills and writing skills
- practicing their research presentation
- improved their organizing skills
- able to interact with other students from different disciplines
- good preparation for graduate school
- became more confident with speaking in front of others
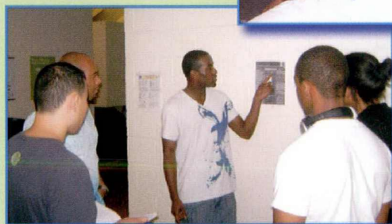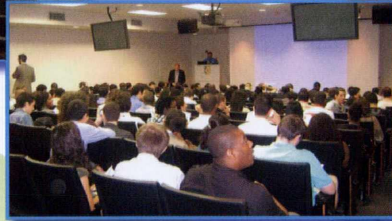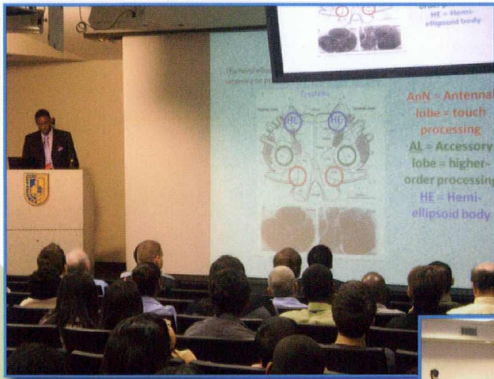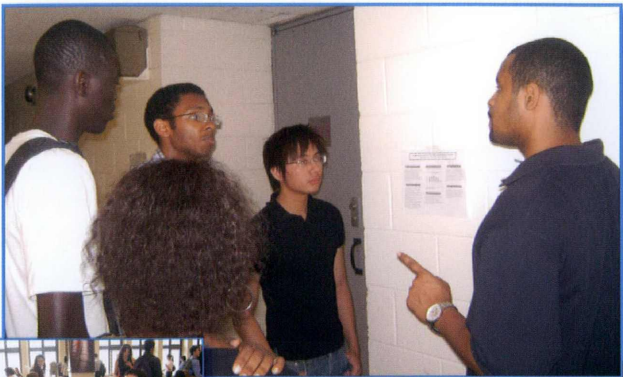
Lehman Professor and CUNY Colleagues Receive $600,000 NSF Grant To Help Boost Students' Quantitative Reasoning *Reprinted with permission of Lehman College*

Most of us remember working with word problems in high school math class, which taught us how to apply numbers in context. But Lehman Sociology Prof. Esther Wilder believes that the strong emphasis on testing in many high schools dilutes these quantitative reasoning (QR) skills. Instead of developing the ability to apply numbers and data in real-world situations, she says, students focus exclusively on getting the right answer.

Funded by a recent $600,000 grant from the National Science Foundation (NSF), she and more than a dozen colleagues in The City University of New York are developing a new CUNY-wide, online course that will train faculty to teach QR skills, not just in math class, but across disciplines.

"Quantitative Reasoning is a competency and comfort in working with numerical data, which enables individuals to reason and solve quantitative problems found in a wide array of everyday life situations," explains Dr. Wilder. "They can understand and create sophisticated arguments, supported by quantitative evidence, and clearly communicate those arguments in a variety of formats, such as words, tables, graphs, and equations." Unfortunately, she adds, studies have shown that many students today lack the QR skills needed for personal and professional success.

QR is increasingly being recognized as an essential goal of a college education, and dozens of schools throughout the country, ranging from community colleges to four-year colleges and universities, have implemented some kind of course or program to strengthen their students' QR skills. At CUNY, the new proposed core curriculum identifies both mathematics and QR as essential areas of undergraduate education.

"I want people to be able to read The New York Times, look at a chart and critically analyze it," says Dr. Wilder. "QR gives students a variety of skills, like interpreting mathematical information and communicating that information to support their arguments. These skills are essential whether a student becomes a reporter, teacher, researcher, social worker, bank teller, or any of the dozens of occupations that our students will choose."

Dr. Wilder heads the project as its Principal Investigator (PI), working with a team of more than a dozen faculty members from throughout CUNY. Lehman Economics Professor Dene Hurley and LaGuardia Community College Mathematics Professor Frank Wang are the project's co-PIs. Over the course of the three-year grant, several dozen more CUNY faculty will collaborate with the team.

Their goals range from teaching faculty to apply QR within a disciplinary context to identifying and implementing best practices for teaching QR. Those might include active learning (such as lab work in which students analyze data first-hand), collaborative student learning, and writing about data. The idea is to move away from a traditional lecture format where students are passive recipients of information.

The team hopes to offer the course within CUNY in the summer of 2012. In subsequent years, the team will refine the course, open it to additional CUNY faculty, and promote its dissemination nationally.

"To make an initiative like this succeed, it needs to be institutionalized," says Dr. Wilder. "We believe it will be more effective to first teach the teachers." The course will be hosted by the Science Education Resource Center at Carleton College, a widely used Internet resource. "Our underlying philosophy is that repeated exposure is required throughout the curriculum for students to master these skills."

Dr. Wilder joined the Lehman faculty in 2002. She received her B.A. in journalism from the University of Massachusetts and her Ph.D. in sociology from Brown University. From 2004 to 2007, she was the Principal Investigator for a NSF-sponsored grant to infuse data analysis throughout Lehman's sociology curriculum. As a result of that project, she published two articles in the American Sociological Association's journal Teaching Sociology.

NOAA-CREST
Begins Second Decade with $15 Million Grant

Aims to Become 'National Center' Serving Government, Academic and Scientific Communities
Reprinted with permission of City College

Dr. Reza Khanbilvardi

The NOAA-Cooperative Remote Sensing Science and Technology Center (NOAA-CREST) has begun its second decade of operation, supported by a new five-year, $15 million grant from the National Oceanic and Atmospheric Administration.

The center, which is based at The City College of New York and includes four other university partner institutions in California, Maryland, Virginia and Puerto Rico, aims to become an international and national center that will serve government agencies as well as the academic and scientific communities.

"In less than 10 years, NOAA-CREST has been able to establish itself as one of the country's premier research centers," said Dr. Reza Khanbilvardi, the center's director and a NOAA-Chair Professor of Civil Engineering in CCNY's Grove School of Engineering. "Most of our graduates are finding jobs before they graduate. Our research products are being used not only by NOAA, but by other agencies at the federal, state and local level, such as NASA and the EPA."

NOAA-CREST was one of five cooperative science centers established nationwide through NOAA's Educational Partnership Program with minority-serving institutions. Its research agenda is focused along four broadly based and interconnected themes: climate; weather and atmosphere; water resources and land processes; and ocean and coastal waters.

Besides CCNY and five other CUNY colleges, member institutions include Hampton University, University of Puerto Rico, California State University – Los Angeles and University of Maryland – Baltimore County.

The center has established a proven track record in recruiting, educating, training and graduating students from diverse backgrounds. To date, it has produced 350 graduates, 82 percent of whom are from groups underrepresented in the remote sensing sciences.

Its education programs, which run from kindergarten through PhD training, offer rigorous academic programs complemented by hands-on participation in state-of-the-art research tied to NOAA interests. Partnerships among CREST faculty, NOAA scientists and industrial partners Raytheon, Northrup Grumman and ERT Inc. enhance CREST activities by engaging scientists from off campus as co-mentors for CREST students.

Under the new grant, NOAA-CREST will continue to address NOAA's goals of increasing environmental literacy and developing a skilled and diverse workforce. It has developed a conceptual model to prepare, encourage, engage, educate and employ students in NOAA-related sciences while increasing environmental literacy among professionals and the public.

In addition, the CREST center has a robust research agenda with 18 major projects involving 104 tasks now underway. CREST scientists, including 40 CUNY scientists and faculty members, are conducting these investigations in collaboration with more than 40 NOAA scientists and 15 Advisory Board Members. To date, CREST scientists and students have published more than 150 papers in peer-reviewed journals and presented at more than 300 scientific conferences in the United States and abroad.

Professor Khanbilvardi expects the center's research output to grow over the next five years thanks to investments in infrastructure and several key faculty hires. "We have built a unique research infrastructure and assembled a great team of well-known scientists and faculty," he said. "Together, they have enabled us to gain recognition as one of the leading technology-driven science centers for remote sensing of the earth in the country."

The center owns and operates an array of sophisticated instrumentation that addresses all four remote sensing monitoring thrusts – air and climate; coastal and ocean waters; land, and hydrology – and offers regional and local data compilation and analysis capabilities. They include:

- The Microwave Observation Unit, which measures snowmelt, soil conditions and tropospheric weather conditions.
- The Long Island Sound Coastal Observation Unit, which is the only facility of its kind in the United States that measures radiance from coastal waters.
- A satellite earth observation station that receives and analyzes data directly from polar orbiting and geo-

stationary satellites.

- METNET, a network of sensors that measures air quality in New York City and the New York metropolitan region.

Other facilities include: the CREST LIDAR Network, which spans from New York to Puerto Rico; computational, GIS and UNIX laboratories, and a mobile LIDAR laboratory.

In addition, several internationally prominent researchers on the Grove School of Engineering and City College Division of Sciences faculty have affiliated with NOAA-CREST. They include Dr. William Rossow, distinguished professor of electrical engi-

neering; Dr. Jorge González, professor of mechanical engineering; Dr. Charles Vörösmarty, professor of civil engineering, and Dr. Kyle McDonald, professor of earth and atmospheric sciences.

The center envisions becoming the national remote sensing of earth institute for the United States, especially the Northeast, over the next decade. It expects to provide research and training that will be used by government agencies, scientists and academics. Models being developed by CREST scientists will address global and regional issues related to climate change including: disaster management, water resources assessment, coastal water management and severe storm tracking.

CREST also is working to expand its education agenda beyond providing support for students pursuing bachelors, masters and PhD degrees. It aims to provide a "K (kindergarten) to grey" menu of offerings that will include: professional development for engineers; pre-service and in-service training for teachers; summer research training for high school students through paid internships, and science enrichment activities for younger students.

NOAA-CREST Center
http://crest.ccny.cuny.edu/

BMCC Wins $300,000 NSF Grant for New Geospatial Technology Program

BMCC was just awarded $300,000 from the National Science Foundation (NSF) to develop five new courses in Geographic Information Science (GISc)—the first program of its kind at a CUNY community college.

The project—funded by NSF's Advanced Technology Education (ATE) program—will prepare students for entry-level employment in the fast-growing field of geotechnology, and provide the basic education to enter the third year of a bachelor's degree program in GISc.

Eventually, says the project's Principle Investigator, Computer Information Systems (CIS) Professor Don Wei, "We will work with Hunter College's 4-year geography program, and create a pipeline of students from our program to theirs."

In this first phase, he explains, "The GISc courses will be developed, and BMCC faculty will work with Hunter's

geospatial specialists."

Interdisciplinary approaches are the future

Four BMCC professors—two computer scientists and two social scientists—collaborated to shape the new courses, which will improve students' geo-literacy through innovative use of emerging technologies, case studies, hands-on projects and in-class research. "Students will be able to look at social problems, and learn practical tools to solve them," says Professor Patricia Mathews-Salazar, Director of the Ethnic Studies department at BMCC, and a Co-Principal Investigator for the project, along with CIS Professor Yan Chen, and Professor Emily Anderson, Chair of the Social Science department. "Interdisciplinary approaches are the future, when it comes to solving many issues," says Mathews-Salazar, who is also a cultural anthropologist, and teaches Human Geography, where "we don't just look at mapping, but at

what humans make with their environment, as well as constraints of the environment."

Geospatial technology, she explains, "means using computer systems to map social landscapes—which have to do not just with place, but with groups of people and communities, all represented by data—and that's a skill related to many emerging employment opportunities, at many levels."

The technology, which visualizes, measures and analyzes Earth's features is popularly associated with GPS (Global Positional Systems), but is also applied in disaster management, locating water sources, tracking pandemics, city planning and military applications. It is increasingly vital in the telecommunications, utilities and transportation industries, and according to the U.S. Department of Labor, the field is growing at an annual rate of 35%.

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15TH ANNUAL SCIENCE CONFERENCE

Sponsored by NSF/AGEP and the Office of the Provost

Friday, March 2, 2012 • 9am-5pm
at The CUNY Graduate Center • 365 Fifth Avenue • NY, NY 10016

DEADLINES:

Oral Presentation Submission Deadline: February 13, 2012
Registration Deadline: February 17, 2012
Poster Presentation Submission Deadline: February 20, 2012

Abstract submissions for both oral and poster presentations
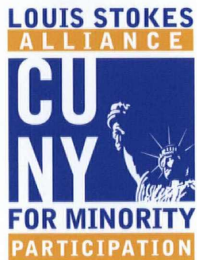should be submitted online at www.cunyagep.org.

For more information and to register please visit
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