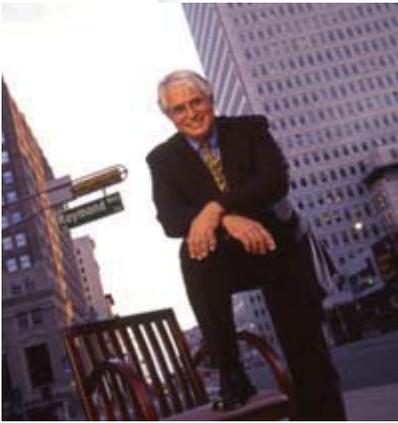


GARDEN STATE LSAMP IMPACT REPORT 2011



RUTGERS UNIVERSITY - NEWARK
Lead Institution





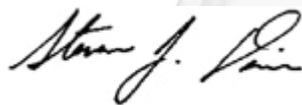
I am proud to report that for 13th year in a row, U.S. News and World Report has ranked Rutgers-Newark the most diverse national university in the United States. We have achieved this distinction every year since U.S. News first began assessing diversity.

This rich diversity offers an extraordinary educational opportunity to our students. The leaders of American higher education have long argued that student diversity is essential for first-rate education. Here at Rutgers-Newark, our students and recent graduates enthusiastically affirm the educational value of racial, ethnic and religious diversity.

Every year hundreds of graduating seniors, responding to open-ended questions on exit surveys, say that the diversity of the campus contributed profoundly to the quality of their Rutgers-Newark education. Indeed, students comment positively about our diversity many more times than they comment about any other aspect of their experience at Rutgers-Newark. And I hear the same theme repeatedly from alumni who have graduated in the last decade. Those who have gone into the business world tell me that diversity is widely recognized as integral to business creativity in the global marketplace, and that the experiences they gained here working with people from so many different backgrounds has given them a competitive advantage in their careers.

Many of our faculty recognizes the unique learning opportunities offered by the unparalleled diversity they find in their classrooms, and they integrate it into their teaching. I plan to expand on these efforts by launching a program this year that will help faculty explore new ways to use our unique student diversity as a teaching tool.

The entire campus community should take pride in continuing to achieve this ranking and the unique educational opportunities it represents.





Dr. Alexander E. Gates
Vice Chancellor of Research
Executive Director and CO/PI
GS-LSAMP

The GS-LSAMP Scholars have outstanding opportunities to help them complete a degree in STEM fields as well as navigate exceptional career opportunities. Being an LSAMP Scholar provides our students with international lab experiences as well as eligibility to NSF's Bridges to the Doctorate program. Our GS-LSAMP scholars are part of a Learning Community, earn stipends for tutoring, mentoring and research assistantships, and attend LSAMP related conferences in Washington, DC. They graduate with a solid degree and have many opportunities for careers / graduate school.

Finally, STEM professionals are in such high demand that their careers are very stable even in tough economic times.

Dr. Alexander E. Gates





The Garden State-Louis Stokes Alliance Minority Participation with Rutgers-Newark as lead institution launched in year 2009 is continuing to grow in excess of 1000 GS-LSAMP participants with greater projections through the fall 2011 semester. The alliance sponsors an annual STEM Career Conference with an emphasis on both job readiness and securing stem research internships.

We are pleased to report that there was a high level of interest in research internships in the first two years of LSAMP programming. A confluence of successful funding efforts from NSF and the US Dept of Agriculture resulted in the facilitation and funding of almost 80 undergraduate STEM research projects and internships in the summer of 2010. Activities ranged from computer science modeling , organic chemistry synthesis to GIS/GPS mapping, Biochemistry and Molecular Biology at the NJMS-UH Cancer Center, Plant Biology at the Gateway National Reserve, General Biology DNA sequence at Cambridge University, England, Chemistry with an interest in synthesis of metal nanoclusters and Environmental Studies/Geology with the Conserve Wildlife Foundation of New Jersey to community outreach, in a wide variety of settings ranging from the lab to the farm to local parks. Many of these efforts have continued into fall 2011. GS-LSAMP students are being groomed for poster session presentations at our upcoming annual STEM Career Conference as well as an annual Student Research Symposium to be held at one of the alliance member colleges.



RUTGERS UNIVERSITY - NEWARK

Undergraduate Research Experiences

Rutgers Newark prides itself on being a research university where the number of undergraduate students participating and exploring the STEM fields through research is constantly increasing.

The GS-LSAMP program at Rutgers Newark has played an integral part in placing students with faculty members in both research laboratories as well as field research positions. During the summer months of 2011, fourteen students were placed in research positions with supporting faculty members at Rutgers Newark.

The students who conduct research throughout the year showcase and highlight their research contributions at a campus wide annual undergraduate research day. The undergraduate research day is also a forum where the general student body can explore the research possibilities and interests of faculty members at Rutgers Newark.

Below are quotes from a focus group conducted with students on how they fully benefited from their research experiences:

"I not only learned more specified information in my field by doing the research, but I learned life skills on how to conduct myself professionally and work in a lab."

"I felt part of the research team."

"Doing research gave me an opportunity to apply what I have learned in my classes."

STEM Graduations Rates

The year prior to the GS-LSAMP program's implementation at Rutgers Newark, the number of STEM degrees awarded to graduates was 39 degrees. There has been a significant increase in the number of STEM degrees awarded in the subsequent years that the program was in place and supporting students as they pursue their degrees in science, technology, engineering and mathematics. As the program continues to become part of the fabric of the University, Rutgers Newark looks to go beyond its projected goal of increasing the number of students being supported through STEM degrees by May of 2014.

Award Winning Faculty & Elements of the GS-LSAMP Model

The faculty at Rutgers Newark is very supportive and offer many opportunities and mentorship for GS-LSAMP Scholars. Along with research experiences, scholars are given opportunities at local internships sites, annual STEM conferences, and career awareness workshops, workshops on graduate school and GRE test preparation as well as skill building seminars. Scholars also participate in peer study groups and computerized resources to increase mathematic skills as well as reading and writing skills. Students at Rutgers Newark are given a plethora of academic support through services provided at the learning center, as well as academic advising from academic counselors as well as graduate school admissions support.

RUTGERS-NEWARK- GS-LSAMP Student Success Story

Cindy Colon: LSAMP Graduate Rutgers-Newark 2011

I believe that LSAMP has encouraged a lot more students to see the necessity for a connection with an organization and networking amongst your peers. If this is not visible at our simple seminars about opportunities at Rutgers then it is about the opportunities in life. To see the amount of minority students who have already succeeded or are on the way to success is extremely motivating. Also, at a lot of events you find new people who are not a part of LSAMP trying to listen to the knowledge that is being presented, or to receive guidance being offered. This shows just how much impact LSAMP has made on the Rutgers Community.

The greatest advantage of being an LSAMP Scholar is being introduced to a community of like minded scholars who all have similar goals in common. Then being placed under the same programs helps to build a community that is built around the success of one another. Also the ability to have the LSAMP advisors constantly trying to assist you in any way possible allows for my Rutgers experience to be the best it can be. LSAMP has allowed me to improve my knowledge and get closer to my goals of furthering my education not only through their visible presence, of their assistance with research stipends, seminars, and class guidance sessions but also through the support system of knowing that there are people who have your best interest at heart and they are there to help



you succeed in any way possible. LSAMP has also opened my network possibilities to help me reach out to more people and offer some of the experiences that I have learned from while at Rutgers. LSAMP is a wonderful program that I believe has truly helped me to thus far succeed in engineering and I will continue to see the benefits long into my professional career.

Summary

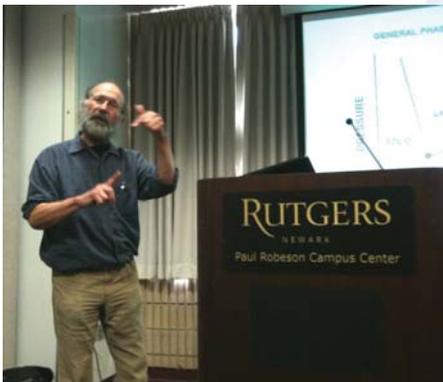
LSAMP has a bright future on the Rutgers-Newark campus. In only two years, the program has made a noticeable impact on the university and its participants. With continued financial support and the commitment of educators and students, the overall success of STEM students at Rutgers will be enhanced and the diversity of those who excel on and off campus will continue to grow.

Cindy Colon (NCAS '11) remembers how elated she was when she discovered that environmental science was a major at Rutgers-Newark. She loved earth science as a kid but entered college as a business student, believing it to be a more versatile option. "Then Dr. Alec Gates told me about earth science and geology, and all the applications it has in business today," says Colon, "and I walked out of our meeting with a new major and have never looked back."

Awards and scholarships have followed her: the H.P Woodward Earth & Environmental Sciences Award, ConocoPhillips Scholarship (2011), GSA Exxon Mobile Bighorn Basin Field Award, Texaco Scholar Award (2010). The list goes on, a total of 11 since freshman year at Rutgers-Newark, culminating with the Marathon GeoDE Graduate Research Assistantship, which will fund her doctoral work in geology at Louisiana State University starting this fall.

Along the way, Colon has done some prestigious field camps and internships. This past summer, she was one of 65 graduate and undergraduate students nationwide to attend Indiana University's Geologic Field Camp, where she learned geologic mapping in South Dakota and Montana. Last year, she took part in the NASA Planetary Geology and Geophysics Undergraduate Research Program, at John Hopkins University's Applied Physics Laboratory, where she analyzed HiRISE images of dunes and ripples on Mars, using ISIS programs to determine any offsets attributable to bedform migration. Her research data, along with that of her colleagues, was published in the Feb. 4, 2011, issue of the journal Science.

Colon's stunning list of accomplishments would be notable for the most privileged of students. They are all the more impressive given the obstacles she has overcome: being raised in Elizabeth, N.J., by an older sister after her single mother died when she was just 5 years old. She, in turn, helped raise her sister's kids while growing up. "I've been very fortunate, and Rutgers-Newark LSAMP has been my foundation," says Colon



RUTGERS - NEW BRUNSWICK

Overview

The funding received from the National Science Foundation has helped the Louis Stokes Alliance for Minority Participation program have a tremendous impact in its first two years on the Rutgers-New Brunswick campus. The key areas of this impact will be described in the following paragraphs.

A Growing Community for Underrepresented STEM Majors

The LSAMP program continues to be a visible and accessible community of support for underrepresented students aspiring to successful careers in STEM. We now have nearly 500 LSAMP Scholars on the New Brunswick campus, representing an expanding proportion of the URM STEM community on campus.

LSAMP officially began on the New Brunswick campus in September 2009. There were a total of 90 LSAMP Scholars successfully enrolled in the program by December of 2009 when the first group of scholars was inducted officially from a total population of 887 URM STEM majors, representing an enrollment of approximately 10% of the total URM STEM community in New Brunswick. The LSAMP Scholars community continued to grow between its first year and second year expanding from 131 members in March 2010 to 372 members in March 2011, representing a growth of 284%. There are now 455 LSAMP Scholars on the New Brunswick representing a growth rate of 81.7% between March and August of 2011.



Expanded Academic Support Opportunities

One of the challenges of being a student at a large, decentralized university with 30,000 undergraduates is the limited number of opportunities to have close contact with faculty and staff. Retention is enhanced when students are able to build relationships and receive support from faculty and staff. LSAMP funding has been used to provide LSAMP Scholars with expanded academic support and advising opportunities. Tutoring opportunities for LSAMP Scholars expanded as a result of our partnership with Student Support Services and the Office for Diversity and Academic Success in the Sciences. These offices provide students with instructional support in key courses such as calculus, organic chemistry and biology that are often the gateways to academic success in the sciences.

We developed the Winter Academic Advising Program for students during the winter recess that included advising sessions with Academic Advisors, seminars on study strategies and career panels on STEM careers. LSAMP Scholars were able to get expert counseling on course selection, study strategies and ways to expand their post-undergraduate educational and professional opportunities. In addition, we developed a "Lunch with an Advisor Program" during the spring semester to provide LSAMP Scholars with an opportunity to meet with advisors and during the registration period.



Valuable Financial Support

Our primary financial support initiative has been the LSAMP Book Voucher Program. We developed a partnership with the Barnes and Noble Book store on our campus to allow LSAMP Scholars to purchase their text books using book vouchers. To date, we have distributed in total, nearly 800 book stipends to LSAMP Scholars to help them purchase very expensive science text books and other essential supplies needed to excel in their coursework, thus promoting their retention at Rutgers and in the STEM majors.

Educational Enrichment Opportunities for STEM Majors

LSAMP Scholars have participated in a range of high-impact enrichment experiences that have help strengthen their commitment to attaining undergraduate and graduate degrees in STEM and pursuing successful careers in the field. High impact experiences, which include learning opportunities such as research with faculty, study abroad and service learning opportunities, have been shown to have a positive effect on the retention of historically underserved students. Research with faculty and international educational opportunities are a few of the experiences highlighted in the following paragraphs.



LSAMP Scholars at a Public Health Clinic in Nicaragua

Research with Faculty

LSAMP Scholars were able to participate in research with some of Rutgers' most distinguished faculty as a result of the funding received from NSF. LSAMP Scholars received financial support to help defray their expenses while conducting research with faculty. These projects represented a range of disciplinary interests from the impact of exercise on obesity, stem cell and spinal injuries, metals such as copper and indium selenolates and eye movement / vision research. LSAMP Scholars have also conducted research with some of the world's leading scholars such as Dr. Wise Young one of the world's outstanding neuroscientists and a leader in the field of spinal cord injury.

LSAMP-NB has created a partnership with the Aresty Research Center for Undergraduates and Ronald E. McNair Post-baccalaureate Program to facilitate our scholars' connection with research opportunities, while other LSAMP Scholars have developed the confidence to develop relationships with faculty to cultivate their own research opportunities. Since LSAMP's inception, we have provided financial support to nine LSAMP Scholars who have conducted research with faculty during the academic year or the summer and who have presented their research at national conferences. We look forward to the growth of LSAMP Scholars participating in research in the future.

International Service Learning Experiences

LSAMP Scholars have participated in several international educational opportunities since the inception of the program. Six LSAMP Scholars participated in public health service-learning programs with faculty in Ghana, Nicaragua and Mexico respectively. These students shared those experiences with the LSAMP Scholars community generating an increased interest in international learning experiences.



LSAMP Scholars and Mentors at City University of New York (CUNY) LSAMP Research Conference



LSAMP Scholar and Mentor at University Commencement, 2011



Professional and Graduate Education

LSAMP Scholars are exposed to the range of career options available for STEM graduates and have a competitive edge as they enter the job market. Our students interned at a variety of agencies such as the US Department of Agriculture, Princeton University Strength and Conditioning Center, and the Essex County Cancer Coalition to name a few. We have also given LSAMP Scholars the opportunity to intern with the LSAMP-NB program as Undergraduate Interns, providing them with an opportunity to learn about the important work done in retaining STEM undergraduates. We invited speakers to share their knowledge with LSAMP Scholars about graduate educational options after they finish their education. Speakers have included current STEM doctoral students and graduate school representatives who discussed the range of post-graduate educational opportunities available for STEM graduates. We also provided opportunities for LSAMP Scholars to attend conferences that highlighted their peers' research in STEM disciplines.

Promoting Scholar-Leader-Citizens

The funding from the National Science Foundation continues to provide LSAMP Scholars with important leadership opportunities on campus. We have developed several initiatives to leverage the knowledge of LSAMP Scholars to promote success in their community. A total of 36 LSAMP Scholars have served their peers as tutors, summer bridge peer mentors and peer mentors for first-year LSAMP Scholars. Twenty of our best LSAMP Scholars have been selected to serve as LSAMP Ambassadors, providing wise advice, knowledge and support to their first-year classmates. This program will be officially inaugurated in the fall 2011.

Increasing Minority STEM Graduates

To date, we are proud to say that 37 LSAMP Scholars have completed their undergraduate degrees at Rutgers-New Brunswick. Among our first graduates is Ryan Rebozo, a Bridges to the Doctorate Scholar at Drexel University. Ryan graduated with undergraduate degrees in Ecology & Natural Resources and is pursuing a graduate degree in Environmental Science, where his research will focus in the area of pollination ecology to develop new conservation strategies for rare plants and insects. We expect the numbers of our graduates to grow as more LSAMP students participate in the programs initiatives.

LSAMP's Impact At Rutgers - New Brunswick: Voices Of LSAMP Scholars

Name: Jordan Muse
Hometown: Philadelphia, PA
Class Year: 2011
Undergraduate Major: Exercise Science & Sport Studies
Career Goal: *Long term:* Open my own community & recreation center.
Short term: Open my own fitness business.

By being a scholar, my experience was impacted the most because I realized there were programs available that were here to help with my struggles and when I had questions, answers were found. Having the LSAMP support made my last year at Rutgers much easier. I also enjoyed meeting other students who were facing similar struggles as a student in the sciences and assisting the younger exercise science students. Also, the LSAMP faculty was great. By being a LSAMP scholar I believe I now have a better idea of the multitude of careers I can participate in as an exercise science student. I had a fairly narrow view of what I could possibly do in the future, but now I have more options.



Name: Jonathan Roldan

Hometown: Elizabeth, NJ

Class Year: 2014

Undergraduate Major: Biological Sciences and Public Health

Current Goals: My current academic goals are to get involved in research with professors in the biology and public health departments at Rutgers.

Being an LSAMP scholar has opened up so many doors for me even early after my freshmen year. I was fortunate enough to land an internship in the Division of Microbiology, at the Center for Food Safety and Applied Nutrition, of the Food and Drug Administration in College Park, Maryland this summer. I learned and helped out with a variety of experiments that concentrated on research to prevent foodborne pathogen outbreaks, more specifically, salmonella. I would not have been able to do this internship without the help of LSAMP and I thank this amazing program for allowing me to experience this opportunity which was beneficial to my overall academic career. This program promotes the advancement of students in STEM majors and it is the backbone of our academic success.

I conducted scientific research during the summer following my freshman year, during an internship at the Center for Advanced Biotechnology and Medicine with Dr. Wise Young. During this same summer, I also began to conduct research in the W.M. Keck Center, a neuroscience laboratory for spinal cord injury. During my time in this lab, my projects have had implications for spinal cord injury as well as the treatment of brain tumors.



Name: Walter Fortson

Hometown: Philadelphia, PA

Class Year: 2013

Undergraduate Major: Exercise Science and Sports Studies

Graduate Major/Institution: Exercise Physiology (anticipated)

Awards or Accomplishments related to STEM:

- McNair Post baccalaureate Achievement Program
- Exercise Science Honors Program
- Research in Nutrition, Research in Exercise Science,
- Research Experience for Undergraduates Summer Support Stipend
- LSAMP Research Support Stipend

Career Goal: Obtain a PhD in Exercise Physiology, Teach on the collegiate level

Being a part of the LSAMP community here at Rutgers has truly been to my benefit in countless ways. LSAMP has afforded me the opportunities to establish relationships with faculty and administrators, introduced me to other LSAMP scholars in the same discipline, and given me support that provided the stability which helped me focus on academia and extra-curricular activities. "

The greatest advantage of being an LSAMP scholar is the support and services LSAMP provides. The support I received from LSAMP was the keystone that propelled me into many of the programs in which I currently partake. Because I come from a low-income background, I must work a part-time job concurrently with school in order to continue to support myself throughout the school-year. LSAMP not only provided me with a book stipend, but also a generous support stipend which allowed me to participate in extra-curricular activities such as research, mentoring, and other community service; all which enable me to be a more competitive candidate for graduate school. It is because of LSAMP that I can list these feats.

LSAMP has impacted the Rutgers community in the same way it's impacted me. LSAMP continues to support, service, and unite the Rutgers community by being that "ram in the bush" one can count on in the time of need. With programs like "Bridging the Gap," the annual men's retreat, multicultural celebrations, support, tutoring, and advising, my time has been that much more enriching and my future is that much more promising. LSAMP makes the Difference!



Name: Kareem Holligan

Hometown: South Brunswick, NJ

Class Year: 2013

Undergraduate Major: Chemical Engineering

Awards or Accomplishments related to STEM: Synthesized publishable inorganic chemistry material

Career Goal: Pursue a Doctorate in Chemical Engineering and conduct further research

Being an LSAMP scholar has impacted my Rutgers experience tremendously; it has allowed me to further my research and given me ample motivation that I can succeed in all my endeavors. Being able to meet with like minded students who face the same hardships as me and hearing the success over certain obstacles is very inspiring. It has allowed me to build a Rutgers network within the LSAMP community that I believe gives me an excellent support system, to help me reach my goals. My network has helped me from ranging to studying to learning more about myself. Also the seminars and guidance counseling that LSAMP offers allows me to learn much more about the vast range of programs and opportunities Rutgers' has to offer that I never knew before. LSAMP has helped me become more acquainted with Rutgers and all it has to offer as well as the community within.

This past summer due to monetary issues I was unsure if I could devote the efficient time to my research without being subsidized because I would have had to work an outside job as well conduct my research. But the LSAMP research stipend allowed me to strictly continue my research. Over this summer I was able to complete nearly 4 of the 7 requirements that I need to complete for my paper. This will hopefully give me enough time to complete the paper by the end of my junior

year and have it published by the end of next summer. This was the overall goal because my aspirations for graduate school rely heavily on the completion of the paper, since it is a big accomplishment. LSAMP was able to offer a research stipend that made this possible and put me one step further to succeeding in all my endeavors.

Being an LSAMP scholar has allowed me to get insight on graduate school information that I was not aware of before. Specifically in regards to funding for graduate school and the possibilities available even at Rutgers for dual degree or taking graduate courses during your undergraduate studies. All this information has convinced me that I can succeed in graduate school and help to affirm my future goals of pursuing a doctorates degree. Also, through the research initiative that LSAMP offers, I have been able to take my research one step further in completing the necessary components to publish a paper. The publication will also be a significant asset towards my doctorates degree.

BLOOMFIELD COLLEGE

Bloomfield College is a small (2,000+ students) private institution located in northeastern New Jersey. The College has been in existence since 1868. Its roots are religious. The College was established to train German-speaking ministers to serve the increasing numbers of German immigrants to New York and the surrounding communities as a result of the European unrest in 1848. Hence, the College started out as the German Theological Seminary of Newark, New Jersey.

Because it is located in Essex County, in the town of Bloomfield, Bloomfield College has a significant minority population. At Bloomfield College, the term "minority population" applies both to students coming both from minority ethnicity as well as financial situations of extreme hardship.

The majority of the students at Bloomfield College are first-generation college students. Frequently, they come from single parent families. Frequently, their parent(s) had no more than the equivalent of a grade school or, at best, a high school education. Many come from immigrant families or are themselves immigrants to this land of opportunity.

Bloomfield College's mission, as it appears in the 2011-2012 catalogs, is: To prepare students to attain academic, personal and professional excellence in a multicultural and global society.

LSAMP'S Impact On The Student Population

The Bloomfield College campus is small (11 acres), with a small number of students (~2000). Although there is a resident population, the majority of the students commute. In addition, most work at least part time. Many have families of their own. Many work full time. Many work to help their families survive. Many work to make sure that younger siblings have an easier time while in school. Because of this, the students have busy lives with little time for clubs and external activities. LSAMP provides a perfect opportunity for these students. They have no time to organize a science club. On the other hand, it is desirable to have an "organized" group for STEM students on campus, for many reasons, including that having such an organization keeps STEM students continuing to be interested in STEM majors.





For this, LSAMP is wonderful. It doesn't put the organizational burden on students with busy lives. It involves faculty, staff, and administration in those aspects. LSAMP at Bloomfield College provides students with an opportunity, once a month, to get together, to listen to interesting presentations, to interact with other students (in their own or other majors), to interact with the speakers, to expand their learning beyond the classroom, and, to interact with the professors in their classes.

In addition, LSAMP has provided Bloomfield College students with summer research opportunities, off-campus summer opportunities, and opportunities to conduct research with College faculty during the academic year. A number of students have taken advantage of these opportunities.

In view of the fact that, without LSAMP, our students would not have had these opportunities, for Bloomfield College, LSAMP has been a godsend. LSAMP has provided our very financially poor students with funding to explore new options and learn new things, things outside of the classroom setting! In conclusion, Bloomfield College LSAMP scholars have graduated and gone on to graduate school or employment in the field. The ones who haven't graduated continue to contribute support and information to junior members, providing information, tutoring, and moral support. For us at the College, this is a win-win situation.

Bloomfield College LSAMP Activity Outcomes

1. Students learned to method develop.
2. Students learned to collect, analyze, and interpret data in the laboratory.
3. Students learned to summarize and write reports.
4. Students learned to collaborate with fellow students and faculty.
5. Students gained experience in research project management.
6. Students learned how to present research professionally and confidently.
7. Students gained experience in oral presentations.
8. Students learned to use complex pieces of laboratory equipment.

Below are some comments from the participants in Bloomfield College LSAMP program.

This program has opened a new window of opportunity for my future. When I was on the retreat I met new people and gained knowledge for the future. I still have much to learn, of course, but getting this head start is what I needed. In the classroom, I learned about websites that will come in handy when I need help. The online labs were interesting and the lessons seemed like a small review of what I have forgotten in my science class. There was also that great lecture from the person you brought in. He made me realize that in college I can't just go on by with just an average score. In my high school, I would settle for it but now in college, I can't settle for it. I need to push myself and that is what I am going to do.

Kevin Sanchez, July 2011



During the LSAMP program I've learned so much about the techniques of studying cells and atoms. It was great four weeks' experience for me and I know it will benefit me now and in the future. I look forward to learning more about STEM during the fall semester. It was fun and very educative. The program motivated me to be a STEM major because of the knowledge that comes with learning science. It's a very important subject and it is something I want to learn more about in the semester. Overall it was a great experience and I appreciate the program for allowing us to enhance our mind in the study of science.

Jabril Paul, August 2011



I enjoyed going downstairs to the lab to see and interact with the other biology major students as they worked on their project. I had no least favorite activity. Everything that was done was all right, nothing to complain about. I think we should have covered the different branches of biology. I learned more about polymerase chain reaction. They should provide snacks and we should have a lab to go work in for one whole big project."

Markenson Quetant, August 2011

The LSAMP Science summer program was a great opportunity for my friends and me. It reminded me of the important materials that I learned during high school. I was very interested in the virtual labs online and it made me more interested in searching about more experiments online and makes them more accurate with their results. With these online experiments, it motivated me to be more interested in continuing with my major and attempting to continue with my education after Bloomfield College. I am looking forward to the upcoming semester and anxious to be working with Dr. Ankrah and the others during the semester, while learning various types of experiments and hands-on activities as well as attending another LSAMP trip to the School of Conservation, and enjoying the amazing activities that they come up with for next year and the years to come.

Jonathan Sia, August 2011



KEAN
UNIVERSITY
www.kean.edu

KEAN UNIVERSITY

Kean University is a public cosmopolitan university serving undergraduate and graduate students in the liberal arts, the sciences, and the professions. The University dedicates itself to the intellectual, cultural, and personal growth of all its members — students, faculty, and professional staff. In particular, the University prepares students to think critically, creatively and globally; to adapt to changing social, economic, and technological environments; and to serve as active and contributing members of their communities.

Kean is steadfast in its dedication to maintaining a student-centered educational environment in which diversity can flourish and an atmosphere in which mutual respect characterizes relations among the members of a pluralistic community. The University seeks to combine excellence with equity in providing opportunities for all students.



Diversity

Kean University is committed to growing and sustaining a diverse and inclusive learning environment. To that end Kean practices equity in its recruitment and University policies. Kean's faculty, staff, and student body all reflect the college's dedication to diversity. Kean University administration believe that exposure to diverse perspectives enhances the educational experience for all concerned. Kean takes pride in the richly varied backgrounds of its diverse faculty and student body; it has been recognized nationally for these efforts. Throughout its long history, Kean has remained true to its mission of combining excellence with equity in providing opportunities for all students. Kean has historically served a diverse student population, and 50% of our undergraduates are from underrepresented groups, while 54% are first generation college students (See Mission Statement). Sixty-six percent of our students are awarded need-based financial aid. Kean was named as one of the nation's top five universities for diversity by DiversityInc in 2008. Kean was honored by Hispanic Outlook in Higher Education Magazine in its Top 100 list, which recognizes the four-year colleges and universities awarding the most bachelor degrees to Hispanics, indeed Kean ranks 15th in the nation in the number of education degrees awarded to Hispanics. Kean's diverse demographics extend to areas other than ethnicity, with substantial numbers of adult students enrolled full-time.

Special Initiatives

Programs implemented at Kean University are designed to provide students with advisement and tools that prepare them to better succeed in the job market and/or graduate studies. The Garden State - Louis Stokes Alliance for Minority Participation (LSAMP) plays a significant role in achieving this objective.

- LSAMP – The Louis Stokes Alliance for Minority Participation, funded by the National Science Foundation, is designed to significantly increase the number of professionals in STEM fields from minority groups, who are traditionally underrepresented. The first cohort at Kean consisted of 35 participating students. The program is now in its second year, and we have tripled the number of students to 105. LSAMP's impact on our students include:

- (1) Learning Community of students who help each other succeed in classes by participation
- (2) Counselors to help students personally choose courses and programs best suited to their interests
- (3) Stipends for tutoring, leading study groups, doing research, community service, etc.
- (4) Research experiences in STEM area of interest in Kean University laboratories
- (5) Garden State-LSAMP Conferences and networking with the greater LSAMP community
- (6) Internships in STEM industries for practical experience and to make contacts
- (7) Graduate School and workforce preparation and competitiveness

GS- LSAMP scholars may also have an opportunity to participate in international programs at laboratories that provide financial support.





Students also qualify for the “Bridges to the Doctorate” program that allows each student to attend any one of a number of universities with exceptional financial support for two years just to take courses and commitment from the department to support them throughout their graduate career.

In addition, LSAMP provides students with peer and faculty mentoring, opportunities to participate in “Research Day” at Kean (nine LSAMP students presented their research) to showcase their projects and develop communication and presentation skills, career and graduate school advisement including reimbursement for GRE test preparation, availability of communication and presentation skills, career and graduate school advisement including reimbursement for GRE test preparation, availability of ALEKS software to enhance their math skills, opportunities for paid on-campus summer jobs, establishment of valuable relationships with peers, faculty and staff, participation in on-site and off-site meetings and activities to effectively network with internal and external professionals, academic advisement, workshops on topics of interest, etc.

Additional Collaborations for GS-LSAMP students include:



NEW JERSEY CENTER FOR SCIENCE, TECHNOLOGY AND MATHEMATICS

Kean has amazing facilities to foster math and science education including our new STEM Building, which houses the New Jersey Center for Science, Technology & Mathematics. Opened in summer 2010, the STEM facility is a new, six story building housing classroom and laboratory space for teaching and research in the biological, physical, and chemical sciences and mathematics. The building’s interior reflects advanced thinking on the art of teaching the sciences of biology, chemistry, physics and math as represented in the open-space flexible laboratories, with dedicated venues to support science and math outreach to school children, and adaptable collaborative environments including computational mathematics laboratories, network connection to the University’s Supercomputer and the 3D CAVE for data visualization, immersion and modeling (both funded by the National Science Foundation). The new STEM building provides opportunities for faculty to engage in collaboration around research and program development, and fosters outreach to faculty from other higher education institutions in the state as well.

RONALD E. MCNAIR POST-BACCALAUREATE ACHIEVEMENT PROGRAM

is designed to prepare participants for doctoral studies through involvement in research and other scholarly activities with the ultimate goal of increasing the attainment of Ph.D. degrees by students from underrepresented segments of society. McNair Scholars work with their faculty mentors on their research projects beginning with an intensive five-week residential summer program after their sophomore year and continuing thereafter on a year-round basis. Faculty mentors are responsible for complete supervision of the research projects and the related activities. The mentors provide direction and support, assist the Scholars in the development of research papers and professional journal submission, attend professional conferences with the Scholars, assist the Scholars in developing research skills, and serve as role models. Several LSAMP students are also enrolled in the McNair program.

NJ AIM HIGH ACADEMY: MATH INITIATIVE - The New Jersey AIM High Academy is a three week residential program that provides a group of high-achieving high school students with exposure to college during an intensive summer experience. College students from Kean's McNair Scholars and LSAMP programs and NJCSTM majors provide mentoring. This summer, five LSAMP students served as mentors. The primary goal of the Kean NJAHA program is to increase academic performance in mathematics for a minimum of forty Hispanic/Latino high school rising seniors from the Perth Amboy school district and to motivate them to attend college.

STUDENTS PARTNERING WITH FACULTY (SpF) SUMMER RESEARCH PROGRAM - The Students Partnering with Faculty program (SpF) are an intensive summer research experience that continues into the next academic year and provides research opportunities for students working under the direction of a faculty mentor. This program, established by Kean University in 2004, has been very successful in that 140 students have participated to date, resulting in 26 LSAMP student presentations at major regional and national conferences, six student publications in peer-reviewed journals, and ten student publications in review. It is open to all students.

FAIRLEIGH DICKINSON UNIVERSITY (FDU)



**FAIRLEIGH
DICKINSON
UNIVERSITY**

FDU has a mission to be "a center of academic excellence dedicated to the preparation of world citizens through global education. The University strives to provide students with the multidisciplinary, intercultural, and ethical understandings necessary to participate, lead, and prosper in the global marketplace of ideas, commerce and culture." One of the ways that the School of Natural Sciences of FDU strives to "provide students with the intercultural and ethical understandings necessary to participate, lead and prosper in the global marketplace of ideas, commerce and culture" is to provide scientific research opportunities for our students around the world. We accomplish this through our relationship with Operation Wallacea, www.opwall.com.

Operation Wallacea is an organization funded by tuition fees that runs a series of biological and conservation management research programs that operate in remote locations across the world. These expeditions are designed with specific wildlife conservation aims in mind – from identifying areas needing protection, through to implementing and assessing conservation management programs. What is different about Operation Wallacea is that large teams of university academics (professors) who are specialists in various aspects of biodiversity or social and economic studies are concentrated at the target study site giving volunteers (students) the opportunity of working on a range of projects. The surveys result in a large number of publications in peer-reviewed journals each year, have resulted in 30 vertebrate species new to science being discovered, 4 "extinct" species being re-discovered and \$2 million levered from funding agencies to set up best practice management examples at the study sites. These large survey teams of academics (professors) and volunteers (students) that are funded independently of normal academic sources have enabled large temporal and spatial



biodiversity and socio-economic data sets to be produced, and provide information to help with organizing effective conservation management programs.



The LSAMP program has made impact on FDU by allowing FDU to live up to its mission of being “a center of academic excellence dedicated to the preparation of world citizens through global education” and allowing FDU to live up to its mission to “provide students with the intercultural and ethical understandings necessary to participate, lead and prosper in the global marketplace of ideas, commerce and culture.” The LSAMP program has done this by funding FDU students to participate in research abroad with researchers from around the world and take classes abroad with professors from around the world during the summer of 2011. Students went to Egypt and Honduras. This study abroad program has an impact on FDU because it is one of only a few externally funded study abroad programs at FDU.

The Impact of the LSAMP Program on FDU Students

During the 2009-2010 academic year Gerardo Nunez, a Biology Major and LSAMP student, was the recipient of the Metropolitan Campus Student Pinnacle Award. Students who receive this award have the privilege of addressing the graduating class, students, family members, parents, faculty, staff and administrators at commencement. The LSAMP program has made impact on FDU students by allowing FDU to live up to its mission to “provide students with the intercultural and ethical understandings necessary to participate, lead and prosper in the global marketplace of ideas, commerce and culture.

The Impact of the LSAMP Program on FDU STEM Majors

The learning outcomes of the Biology major of the School of Natural Sciences of FDU are for students to: “(1) have the ability to use the scientific method and understand its strengths and weaknesses; (2) have the ability to research a biological topic using traditional and computer technology; (3) have the ability to read and evaluate professional scientific literature; (4) have the ability to write and communicate science; (5) have the ability to utilize mathematical reasoning and quantitative skills in biology; (6) possess observational and technical skills; (7) possess major field knowledge; and (8) have the ability to successfully compete in biologically related fields.”



The School of Natural Sciences of FDU offers a course called Biology Seminar which is required for all undergraduate and graduate Biology majors. In this course students listen to speakers who are invited to FDU to give talks on a variety of topics of their choice and the students write a paper on the talk of their choice which is then graded by the course instructor. During the end of spring semester each year there are student presentations where FDU students present their research to their fellow students and faculty. During the academic 2009-2010 academic year, 3 of 22 or 13.6% of the students who presented their research in Biology Seminar were LSAMP students and 2 of the 3 or 66.7% were in the University Honors program. One of these students, Gerardo Nunez, a Biology major and LSAMP student, was accepted into the Ph.D. programs of several universities to study Horticulture. These universities

are the University of Florida, Cornell University, and Ohio State University where he was awarded a graduate research assistantship. He was 1 of 5 or 20% of FDU students who were accepted into Ph.D. programs.



During the academic year 2010-2011, 4 of 22 or 18.2% of the students who presented their research in Biology Seminar were LSAMP students. This represents an increase of 4.6% in only one year. It is possible that such visibility is responsible for the growth in the number of LSAMP students at FDU which grew from 23 in the first year to 54 in the second year. Also during that academic year Susan Auler, a Biology Major and LSAMP student, was the only science major at FDU to publish a paper with an FDU professor which makes her the first LSAMP student to do so at FDU. The paper was published in 2011 and is entitled "Beneficial regulation of matrix metalloproteinases for skin health." It was coauthored by FDU professor N. Philips, LSAMP student S. Auler, and collaborators R. Hugo and S. Gonzales. The paper appears in a journal called Enzyme Research.

The LSAMP program has made impact on FDU STEM majors by allowing the Biology major to meet learning outcomes 1-8 which are to: "(1) have the ability to use the scientific method and understand its strengths and weaknesses; (2) have the ability to research a biological topic using traditional and computer technology; (3) have the ability to read and evaluate professional scientific literature; (4) have the ability to write and communicate science; (5) have the ability to utilize mathematical reasoning and quantitative skills in biology; (6) possess observational and technical skills; (7) possess major field knowledge; and (8) have the ability to successfully compete in biologically related fields." The LSAMP program does this by providing the funds necessary for faculty members to purchase research supplies and reagents that they do not have from externally funded grants. The LSAMP program also does this by providing students with stipends for their participation in research with faculty members.



ESSEX COUNTY COLLEGE (ECC)

Mentoring Program

The GS-LSAMP Program paired honors students with other ECC LSAMP students needing additional help in STEM courses. This program provided benefits to both the mentors and the mentees. Tutors were given the opportunity for employment and the experience of teaching. Students being helped were given the opportunity to improve their grades and maintain the higher GPA's needed to transfer to four year colleges and universities.

The spring semester provided 10 tutors to 44 students in the subjects of Pre-calculus I and II, College Physics I, General Physics I and II 119, 121, General Chemistry I and II.

Research and teaching skills experiences

- LSAMP students who served as mentors obtained teaching experience.
- Mentors received training in teaching techniques from ECC faculty.



- Summer research program gave opportunity to ECC community college students to participate in on-going research, to learn to work with various equipment as well as meet faculty and students of universities and four year colleges.
- The GS-LSAMP program has established research program for ECC students during the academic year, which allows them to get research experience while still at the community college.
- The Mentoring Program not only helped students to improve their class performance but to develop a culture of success.



MONTCLAIR STATE UNIVERSITY (MSU)

MSU Garden State LSAMP

The National Science Foundation Louis Stokes Alliance for Minority Participation (LSAMP) program aims to foster success in science and mathematics by minority students in the STEM disciplines (Science, Technology, Engineering and Mathematics). The Garden State LSAMP program, led by Rutgers-Newark, has three clusters of participating colleges and universities in New Jersey. The College of Science and Mathematics maintains a leadership role in the Garden State-LSAMP program. Montclair State University is the “hub” of the program’s northern cluster.



The LSAMP program is aimed at students in the sciences, particularly those from populations underrepresented in science and math disciplines. In particular it seeks to help students successfully complete science, technology, engineering and mathematics (STEM) baccalaureate degree programs, and to increase the number of students interested in and academically qualified for graduate study. Students in the program take part in academic training sessions, have opportunities to carry out research with faculty and to meet with leaders in science, technology and mathematics. Selected students, as LSAMP Scholars, receive financial support (up to \$2000/year) for their LSAMP activities while many others gain the advantage of the program support structure as LSAMP Affiliates.

Impact on research and teaching skills

Peer mentors were trained by the Center for Academic Development and Assessment at Montclair State University. Over the course of the fall semester, students were provided with approximately 10 hours of instruction on how best to relate information to their peers.

MSU faculty members provided research opportunities for other GS-LSAMP students, specifically students from Essex County Community College. Students from Essex County CC were invited to work with MSU faculty members in the summer of 2010.

2011 MSU LSAMP Impact Statement

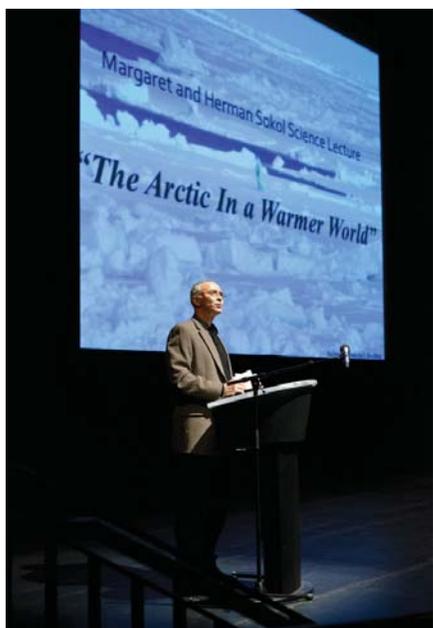
Montclair State University has prided itself in the opportunities it provides to underrepresented groups and the programs the university



has developed to support the success of its diverse population. The NJ-LSAMP grant has allowed MSU to expand its current programs and to reach out across the College of Science and Mathematics to support the success of its underrepresented students. These programs have included

- 1) Opportunities for students to build a Science Community
- 2) Inclusion of EOF science and mathematics students in summer training programs
- 3) A summer retreat to connect students from different LSAMP groups
- and 4) Summer research opportunities for students from the community college.

1. Building a community of scientists. Through the establishment of senior mentors, younger scholars and new freshmen and transfer student affiliates, students are given the opportunity to interact with a variety of students all of whom have a common goal of being successful in their academic careers. Each month, the LSAMP mentors, scholars and affiliates met to discuss opportunities in their chosen fields and some strategies for academic success. In October, students were introduced to faculty members from the various departments. These faculty members met with the students, described their career experiences and explained why they chose their particular profession. In November, students who had previously taken part in summer REU programs described how they identified the particular program, their experiences in the program and the benefits of taking part in summer research. In January, a previous math mentor, currently a masters student at Columbia University, discussed her experiences at MSU, her experiences in the masters program at Columbia and her long term career interests. In February, Larisa Poznahovska, the director of the Center for Academic Development and Assessment, spoke to the students about learning skills that could be beneficial in their courses and how to both recognize and overcome stress. Finally, in March, Ms. Maryam Alapa, currently a masters student in chemistry, spoke to the students regarding her undergraduate experiences at MSU and the differences between her undergraduate and graduate experiences.



In order to maintain cohesion among the students, weekly meetings were organized by the peer mentors with the scholars and affiliates of the program. Students were given the opportunity to meet with other students in their academic area, discuss academic concerns and learn more about their career opportunities. In order to strengthen the skills of the mentors taking part in this program and to provide additional academic support for the scholars and affiliates, the mentors also took part in a fall Supplemental Instruction program, organized by the Center for Academic Development and Assessment. Students received approximately 10 hours of instruction from the center and met with faculty teaching the courses identified as being the most difficult for new science and mathematics majors.

In addition to the monthly meetings will all of the LSAMP students and weekly meetings with the peer mentors, scholars and affiliates, the graduate assistant met weekly with the director of the program to evaluate student progress, programmatic structure and to organize future events. The director and the graduate assistant also met bi-weekly with the mentors to discuss the scholar circle program, share ideas in making the program more successful and address any concerns brought up during the scholar circles.



2. EOF Inclusion in the program. As part of the expansion of LSAMP program, we have strengthened our relationship with the university EOF program. Because of LSAMP, freshmen EOF students have been able to receive additional math tutoring and summer academic preparation. These students will also have the opportunity to take part in all of the programs available to LSAMP students.

3. Expanded LSAMP Summer Retreat. In association with the university's School of Conservation, in Northwest New Jersey, 38 students from numerous schools were able to spend 5 days together. During the week long program, students learned about career opportunities, were able to take hikes and enjoy the beauty of the area, met with faculty from various departments about their research interests and were given an opportunity to get to know each other.

4. Community College Summer Research Opportunities. Essex County Community College students were given the opportunity to work with faculty members at MSU over the summer. These students worked with faculty from the physics and mathematics department to gain valuable research experience.

Student Outcomes

A few examples of the students who have taken part in the LSAMP program at MSU:

Oscar Patterson began his undergraduate program at MSU in the fall of 2009 and graduated with a B.S. degree in Physics in January of 2011. While at MSU, Oscar served as a mentor for the program and provides important support for students within the program and throughout the program. Mr. Patterson completed a research project in the summer of 2010 at the University of Arizona. After completing his degree and this important research experience, he was admitted to the University of Arizona Doctoral program in physics in the spring of 2011.

Michelle Hernandez started as an undergraduate student at MSU in the fall of 2006 and graduated with a degree in Biology in the spring of 2009. In the fall of 2009, Ms. Hernandez was selected to serve as the university funded graduate assistant for the LSAMP program. During her two years in the masters program, Ms. Hernandez helped establish the program at the university while completing her course, research and writing requirement her master's thesis. Michelle Was admitted to the NYU graduate program in Environmental Science for the fall of 2011 and plans to continue on to complete her Ph.D.

After transferring from Saint Josephs University, **Jennifer Mari** enrolled in MSU's mathematics department. During the 1st year of the MSU-LSAMP program, she served as a mentor for mathematics students and provided critical support for the entire program. She graduated with high honors in the spring of 2010 at which point she was admitted to the Math Education Masters program at Columbia University. Ms. Mari's masters degree has been funded through a Math for America Fellowship.





NEW JERSEY CITY UNIVERSITY

NSF-GS-LSAMP Impact at NJCU

Research and Internships

A confluence of successful funding efforts from NSF and the US Dept of Agriculture (both spearheaded by NJCU's LSAMP Project Co-Directors) resulted in the facilitation and funding of almost 20 undergraduate STEM research projects and/or internships in the summer of 2010 and another 20 in the summer or 2011. Activities ranged from Computer Science and Mathematics modeling projects to organic chemistry synthesis to GIS/GPS mapping to community outreach, in a wide variety of settings ranging from the lab to the farm to local parks.

We have developed an extensive network of not-for-profit and governmental partners that have provided a wide variety of STEM internships. Our partners include:

- City of Jersey City
- Natural Resource Conservation Service – US Dept of Agriculture
- Gateway National Recreation Area – US National Park Service
- Jersey City Food Co-Op
- Future City, Inc.
- Hackensack Riverkeeper
- New York / New Jersey Baykeeper
- Conserve Wildlife Foundation of New Jersey
- Liberty State Park



This level of undergraduate STEM activity, let alone funded STEM activity, is unprecedented at NJCU.

Tutoring support

NSF-LSAMP has enabled us to leverage Dept of Education Title V funding to support Math and Science peer tutoring at NJCU. Over the last 2 years, more than 100 Science and Math students at NJCU have taken advantage of peer tutoring, and the number of students availing themselves of this support is growing. The recent introduction of an online tutoring signup system is expected to streamline delivery of peer tutoring services and improve efficiency.



NJCU Chemistry graduate Adolfo Pertuz was awarded a full scholarship to Rutgers University's new Master in Business & Science (M.B.S.) degree in Fall, 2010. Mr. Pertuz's experiences with LSAMP as a researcher and peer mentor were important components of his successful application.



WILLIAM PATERSON UNIVERSITY

Garden State – Louis Stokes Alliance for Minority Participation

The Garden State LSAMP began in the fall of 2009 and will continue for five years. The goal of the alliance is to double the number of under-represented minority STEM (Biology, Chemistry, Computer Science, Environmental/Earth Science & Mathematics) graduates in five years. WPU is one of the universities participating in this effort. The Garden State Alliance is divided into three clusters as follows:

Northern Cluster: MSU, WPU, FDU (Teaneck) & Bloomfield

Middle Cluster: Rutgers-Newark, KU, NJ City U. & Essex County College

Southern Cluster: Rutgers – New Brunswick, FAS, College of Engineering & Cook College

As part of this effort, WPU will be providing the following services and resources:

Academic Year

- A. Regular bi-weekly meetings with academic and support coordinator.
- B. Directed tutoring at SEC, EEC and ASC or with individual tutors.
- C. At least one field trip and one scientific conference.
- D. Research opportunities.



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Provost of WPU
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Professor of Biology



GARDEN STATE LSAMP WEBSITES

GS-LSAMP Alliance
[Http://gslsamp.rutgers.edu](http://gslsamp.rutgers.edu)

Essex County College
www.ecc-lsamp.blogspot.com

Bloomfield College
www.bloomfield.edu/bc-lsamp

Farleigh Dickinson University
<http://view.fdu.edu/default.aspx?id=8599#>

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New Jersey City University
<http://web.njcu.edu/programs/stem>

Rutgers-New Brunswick
<http://lsamp-nb.rutgers.edu/>

Rutgers Newark
www.afc.rutgers.edu

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