FaST
Expanding the Reach of Research Opportunities and Workforce Development

Faculty and Student Teams and National Laboratories

Expanding the Reach of Research Opportunities and Workforce Development
FaST At a Glance

Since the inception of the Faculty and Student Team (FaST) program in 2003 at BNL, the Office of Educational Programs (OEP) has hosted 76 teams from 34 colleges/universities. The following are some data on the program:

- 18 professors are multiple repeaters in the program
- From the participating schools 24 were Minority Serving Institutions (MSI)
- To date a total of 82 proposals were submitted and 37 grants were awarded with 19 pending.
- A total value of $58,892,400 in proposals were submitted and $34,753,900 were awarded in grants.

In 2009 BNL hosted a total of 25 professors in the FaST program, 14 new professors and 11 returning professors from 12 HBCUs, 6 other MSIs and 7 other institutions.

Since 2003 the FaST program has grown from 1 team (3 participants) in 2003 to 25 teams (76 participants) in 2009.

The following is a Growth Curve showing the progress during this period:

Participation:
The program has hosted 203 participants to date. The following is a breakdown of the minority and gender participation:

Diversity Graph:
- Minority 70%
- Non-Minority 30%

Gender Graph:
- Female 34%
- Male 66%
FaST and National Laboratories
Expanding the Reach of Research Opportunities and Workforce Development

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A Message From The Director

The Department of Energy’s (DOE) national laboratory system provides a unique set of research tools for use by researchers from across the globe. Access to the advanced capabilities of these tools provides scientists from our universities and colleges an opportunity to conduct research and to make discoveries that they simply otherwise could not achieve. The machines, equipment, and detectors housed at Brookhaven National Laboratory – including the National Synchrotron Light Source, the Relativistic Heavy Ion Collider, and the Center for Functional Nanomaterials – are examples of world-class resources DOE provides to researchers. Training our nation’s researchers to use these tools and building scientific user communities for them are important parts of our mission. It is also important to the Lab, DOE, and me that our user communities and our facility staff be diverse. The DOE Faculty and Student Teams (FaST) Program is one that I particularly value because it advances these priorities for the Lab.

The DOE FaST Program, run in partnership with the National Science Foundation, has proven to be an effective vehicle to work with communities underrepresented in the sciences, such as faculty and students from Historically Black Colleges and Universities and other Minority Serving Institutions. The FaST Program has enabled Brookhaven to build relationships with talented faculty researchers from these institutions, to familiarize them with and to train them in the use of DOE research tools, and to build collaborations with our scientific staff. This introduction to our research resources has helped us to build and diversify our user base, which is particularly important as we begin construction of our newest machine, the National Synchrotron Light Source II. The faculty members also bring undergraduate students, provide mentoring, and work as collaborators with our scientists, contributing to the Laboratory’s research goals. It is also rewarding to see that the faculty members have been able to leverage their relationships with our research staff and their use of DOE research capabilities to increase the competitiveness of their grant submissions.

I appreciate the foresight of the DOE Office of Science’s Office of Workforce Development for Teachers and Scientists to develop and continue to support this program, as it has provided substantial benefits for DOE as well as the participating faculty, students, and their home institutions. The outcomes outlined in this report are Brookhaven’s, but they exemplify the results of the program across the DOE complex.

Sincerely,

Samuel Aronson
Director, Brookhaven National Laboratory
Welcome

Faculty and Student Teams: Building National Research Capacity at National Laboratories

No matter what business you are in, successful and productive partnerships demand time, energy, enthusiasm and mutual benefit for those involved. If partnerships are to become durable, they must bring consistent and long-standing value to each party. The U.S. Department of Energy’s (DOE) Faculty and Student Team (FaST) program funded by their Office of Workforce Development for Teachers and Scientists, has allowed Brookhaven National Laboratory to establish a foundation from which to launch valuable, sustained partnerships between academic institutions and its research staff. An important factor in this program has been the partnership of the National Science Foundation (NSF) through a Memorandum of Agreement with DOE – NSF support to participating universities has enabled Brookhaven to host many additional teams, particularly those from Historically Black Colleges and Universities and Minority Serving Institutions.

Understanding the importance of programs such as the FaST program is really quite simple. Our national security, economic prosperity, environmental conditions, health and well-being are deeply rooted in our scientific and technological capacity. DOE national laboratories, operating many of the world’s best research facilities, provide the setting where some of the most progressive basic and applied research takes place. Changing demographics, a need for domestic scientists and the advancement of other nations in science and technology mean that we need to tap into resources that are available, yet underutilized in the sciences - our underrepresented minority population and our rural communities. The FaST program establishes the conditions necessary to make advances in connecting national laboratory resources with these communities to our common advantage. The partnerships that have developed involve BNL researchers and university faculty in a way that:

- aligns their research interests to create productive, mutually beneficial collaborations
- focuses on problems of national concern
- introduces faculty researchers to national research tools
- increases faculty competitiveness for grant submissions
- influences academic programming
- introduces students to national research tools and settings through cutting-edge research

This report documents the outcomes of the DOE FaST program at BNL which serves as an example for the DOE complex-wide FaST program. The contents provide evidence that it is truly a foundational program that facilitates durable and sustainable impacts of value to the academic institutions whose faculty participate, the Laboratory researchers who build a research team to tackle challenging problems for DOE, builds capacity at participating institutions, and encourages U.S. students to pursue careers in science, technology, engineering and mathematics.

Kenneth White
Manager, Office of Educational Programs
Brookhaven National Laboratory
A Note From The Program Manager

The Faculty and Student Teams (FaST) Program is a win-win program. You may ask what I mean by that.

The program attracts talented professors who may not be recognized for their work or may not be exposed to national laboratories and their major research tools. Conversely, the scientific community at national laboratories may not have the opportunity to interact with these talented professors since their schools may not be in the top 300 tertiary institutions that the Department of Energy (DOE) normally works with.

What happens when talented professors and the scientific community at national laboratories meet each other?

This report highlights how the FaST experiences at Brookhaven National Laboratory (BNL) successfully fulfill the outcomes expected of this program.

For example, the Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE), formed as a result of the FaST program, encourages and facilitates professors from Minority Serving Institutions to become users at BNL’s National Synchrotron Light Source (NSLS). This new community at the NSLS will increase the user population and create further collaborative possibilities for all. What is very exciting about this consortium is the potential for it to expand its scope at BNL with the use of the Laboratory’s other major facilities and, also, scale up to the entire DOE complex.

Gaining access to research tools and expanding research opportunities is becoming the trend for talented faculty at teaching institutions throughout the nation. These institutions are changing their way of business to keep up with their faculty’s desire for growth, and the FaST program is one way to start capitalizing on the momentum that is already building within their institutions.

In the following pages, you will read articles that demonstrate how the FaST program successfully advances the national interest in sustaining our leadership in scientific research.

I am very excited and passionate about the FaST program. I welcome the scientific community at BNL and the DOE complex at large to take advantage of this endeavor to explore the program’s possibilities. No one knows where the next Nobel Laureate will come from or who he or she might be.

Noel Blackburn
Educational Programs Administrator
Brookhaven National Laboratory
Introduction
Introduction

Introducing the Department of Energy Faculty and Student Teams Program

The Faculty and Student Teams (FaST) Program, a cooperative effort between the US Department of Energy (DOE) Office of Science and the National Science Foundation (NSF), brings together collaborative research teams composed of a researcher at Brookhaven National Laboratory, and a faculty member with two or three undergraduate students from a college or university. Begun by the Department of Energy in 2000 with the primary goal of building research capacity at a faculty member’s home institution, the FaST Program focuses its recruiting efforts on faculty from colleges and universities with limited research facilities and those institutions that serve populations under-represented in the fields of science, engineering and technology, particularly women and minorities. Once assembled, a FaST team spends a summer engaged in hands-on research working alongside a laboratory scientist. This intensely collaborative environment fosters sustainable relationships between the faulty members and BNL that allow faculty members and their BNL colleagues to submit joint proposals to federal agencies, publish papers in peer-reviewed journals, reform local curriculum, and develop new or expand existing research labs at their home institutions.

Distinguishing Characteristics of FaST

The DOE Office of Science (SC) currently supports research at 300 universities, most of which are above the 50th percentile in receipt of Federal funding. The FaST Program is designed to reach out to faculty and students from universities, colleges, and community colleges that have not done business with SC and provide them with the tools, knowledge, and resources needed to compete for future research funding. Introducing these faculty members to DOE research and facilities assists in building capacity at schools that are often minority serving institutions such as rural colleges, Historically Black Colleges and Universities, Hispanic Serving Institutions, and Tribal Colleges. With its emphasis on the science, technology, engineering, and mathematics (STEM) disciplines, the FaST Program not only serves as a platform for the recruitment of future scientists and technicians, it also brings under-represented populations into the DOE research system. Introducing these populations to the DOE national assets for research and sustaining their participation is a primary goal of the program.

Because FaST students may attend two or four-year institutions, this program is integrated with both the Community College Institute of Science and Technology (CCI) and Science Undergraduate Laboratory Internships (SULI) undergraduate research programs. In addition, by developing new and trusted partnerships with non-traditional institutions and participants, FaST supports the outreach efforts of the DOE Workforce Development for Teachers and Scientists (WDTS). Finally, FaST, through its strong relationship with the National Science Foundation (NSF), opens the door to partnership opportunities with other Federal agencies and expanded NSF collaboration.

At the participant level, faculty and students become familiar with SC research and business operations and have the opportunity to expand their participation in WDTS and SC programs through access to the major scientific research tools available only at a national laboratory. At the national laboratory level, research scientists have been able to leverage the experience and expertise of a faculty member with undergraduate research interns and establish reciprocally beneficial durable relationships for expanding their own research and competing for research funding. At the program level, under-represented institutions are working toward increasing their capacity to compete for WDTS and SC resources. Finally, at the enterprise level, DOE and other federal funding agencies will be able to draw employees from a larger and more diversified pool of highly skilled workers. Tapping into this talent pool for both employees and facility users is already happening at BNL.

The Brookhaven National Laboratory Environment

Brookhaven National Laboratory (BNL), home to the work of six Nobel Prize winners and one of ten national laboratories overseen
and primarily funded by the Office of Science of the U.S. Department of Energy (DOE), conducts multi-disciplinary research in the physical, biomedical, and environmental sciences, as well as in energy technologies and national security. Brookhaven Lab also builds and operates major scientific facilities available to university, industry, and government researchers. Examples include the National Synchrotron Light Source (NSLS), the Relativistic Heavy Ion Collider (RHIC), the Alternating Gradient Synchrotron (AGS), the Center for Functional Nanomaterials (CFN), a facility for Positron Emission Tomography (PET) and Magnetic Resonance Imaging (MRI), the Laser-Electron Accelerator Facility (LEAF), and a Scanning Transmission Electron Microscope. These facilities and the supporting laboratories are staffed by world-class researchers, both as BNL and DOE employees and as visiting scientists, who are all highly supportive of the BNL science education and workforce development mission.

In addition to its facilities and staff resources, BNL is located on a 5,300-acre site with great biodiversity and a natural resource management group that is intimately involved in research activities and educational initiatives. The other supporting infrastructure at BNL includes dormitories, housing, a cafeteria and after-hours restaurant, a credit union, post office, gymnasium, rental car facility, and many other quality-of-life facilities and functions for visiting FaST participants.

The rich research environment and an experienced staff within the BNL Office of Educational Programs (OEP), the organization that manages the DOE FaST program, complements physical resources at BNL. The OEP staff includes experienced science educators who manage and operate science education programs at every level from kindergarten through graduate school. Over 40,000 students, teachers, and university faculty participated in BNL science education programs this past year. Many of the science education programs have been in place for several decades and have served as models for some of the current DOE Office of Workforce Development for Teachers and Scientists programs. The OEP staff continues to work collaboratively with BNL scientists and researchers to implement the FaST program by creating opportunities for FaST teams to meet with other BNL researchers, faculty teams, and other summer interns including students in the Community College Institute (CCI), Science Undergraduate Laboratory Internship (SULI), and Pre-Service Teachers (PST) programs. During their stay, these experiences are further enhanced by weekly lectures by resident scientists on their own current research projects as well as a weekly lunchtime meeting for all of the FaST team faculty members where they each report on their research and how the BNL experience is furthering it.

The Brookhaven National Laboratory Research Environment

Once a FaST team arrives at BNL, it quickly finds itself immersed in the highly interactive and stimulating experiences of the day-to-
day activities of a research laboratory. FaST program participants work at the National Synchrotron Light Source (NSLS) as one of the more than two thousand researchers who conduct research at the NSLS each year or at the Laser-Electron Accelerator Facility (LEAF), the preeminent pulse radiolysis facility in the country, and other BNL facilities such as RHIC, PET, and CFN. While at BNL, FaST faculty members use these tools, not normally available to them at their home institutions, to start, restart or kick-start their own research, or to develop new avenues of inquiry to explore at BNL and, subsequently, at their own schools. The student members of a FaST team also benefit since they too become immersed in the research culture of a national laboratory and further develop their own research skills in a richly supportive environment that underscores the benefits of collaboration. The tutelage of a faculty member also adds value to mentoring activities during the academic year. Participating in active research and having good mentorship relations are known to promote student persistence in the sciences. [1]–[8]

The BNL researcher also benefits from the collaboration of FaST teams with a dedicated team of scientists who are working to advance their own research and development objectives. Further, the expertise, insights, and experiences of a faculty colleague also contribute to a supportive environment that reinforces student learning through research participation. The researcher can turn over aspects of the research to the faculty member and students confident that the faculty member, because of his or her awareness of the students’ talents and expertise, will more effectively and efficiently train and supervise the work of the student interns. This close collaboration also provides the faculty member with student researchers who have had the benefit of working in a national laboratory setting and can thus contribute these skills to the faculty member’s own research when they return to their own institution.

In addition to collaborative research and the chance for publications that might grow out of this work, faculty members, energized by their time at BNL, often use this experience as a catalyst for curriculum reform by revising current coursework or developing new courses. In particular, faculty return to their home institutions inspired to enlarge or, more importantly, establish their own research facilities and programs.

The faculty profiles that follow amply demonstrate that pulling together research teams from around the country offers an avenue for improving the research capacity at institutions with limited facilities, providing faculty with the opportunity to further their own research talents, and developing the next generation of scientists, engineers, and technicians.

The profiles also demonstrate the positive impact of FaST on grant writing success, the development of curriculum reform, and the professional growth of FaST faculty and students.

With research facilities such as the National Synchrotron Light Source, the Relativistic Heavy Ion Collider, the Alternating Gradient Synchrotron, the Center for Functional Nanomaterials, the Laser-Electron Accelerator Facility as well as a facility for Positron Emission Tomography and Magnetic Resonance Imaging, BNL offers FaST teams unique opportunities unavailable to them elsewhere with support from researchers who value the chance to collaborate with colleagues and assist in mentoring their students. The BNL FaST Program provides a rich and exciting environment for research, learning, workforce development and long-term collaboration, all focused on some of the most important scientific and technical challenges facing our nation and the world.

List of Works Consulted


Outcome Highlights
FaST Goals

**Department of Energy**
- Advance the DOE scientific mission.
- Seek new users for national laboratory facilities.
- Build research capacity at HBCUs and MSIs.
- Expand faculty and student participation in WDTS and Office of Science.
- Provide opportunities for faculty and students to become familiar with Office of Science research and business operations.
- Introduce students to the various employment opportunities within the DOE workforce family.

**National Science Foundation**
- Develop research and education capacity.
- Develop a scientifically literate public.
- Facilitate partnerships, both nationally and internationally.
- Seek and accommodate contributions from all sources.
- Provide opportunities for faculty and students to participate in interagency research.

**College or University**
- Create opportunities for continuing research.
- Provide for professional development of faculty.
- Foster collaborations with world-class scientists in other institutions.
- Enable faculty to access the world-class research machines of national laboratories.
- Develop research opportunities for undergraduate students.
- Increase competitiveness in grant writing through collaborations with national laboratories.
- Leverage a collaborative association with a national laboratory to develop a science program that attracts talented students.
- Transform teaching.

**Shared Goals**
- Cultivate the world-class science and engineering workforce needed in a global knowledge economy.
- Integrate research with education by developing unique networks and innovative partnerships.
- Motivate students to pursue advanced and terminal degrees.
- Ensure that STEM education and workforce preparation are broadly available.
- Expand participation in STEM fields from underrepresented groups and diverse institutions.
FaST Outcomes

Research
Engaged in research using some of the world’s best tools for advanced scientific inquiry. The FaST research experience has driven curriculum changes.

The FaST experience has lead to increased institutional administrative support for research endeavors.

Collaboration
Established ongoing, collaborative relationships between faculty member and staff scientists at National Laboratory facilities.

Brought in a new population of researchers.

Established new and trusted partnerships with underrepresented groups and diverse institutions from HBCUs and MSIs.

At BNL FaST is integrated with both the Community College Institute of Science and Technology (CCI) and Science Undergraduate Laboratory Internships (SULI) undergraduate research programs.

Mentoring
Established mentoring relationships based on a research participation environment.

Senior research scientists provided mentoring during the grant application process for faculty members.

The student members of a FaST team became immersed in a richly supportive mentoring environment.

Professional and Workforce Development
FaST faculty members used the tools not normally available to them at their home institutions to start, restart, or kick-start their own research or develop new avenues of inquiry to explore further at their own schools.

The student members of a FaST team also developed their own research skills that may motivate them to pursue advanced and terminal degrees in science.

Faculty members have been encouraged by their FaST experience to enlarge or, more importantly, to establish their own research facilities and programs.

Grants
The FaST Program provided faculty members with the tools, knowledge, and resources needed to compete for future research funding.

Publications
Many of the FaST Program’s faculty members have published their work.

Diversity
The FaST Program has brought under-represented populations into the DOE Office of Science research system.
Outcome Highlights

From Incubation to Maturity via the Department of Energy’s Faculty and Student Teams Program
By Dr. Reggie Blake

In the summer of 2004, a year after I became a full-time, tenure-tracked member of the Physics Department of the New York City College of Technology (City Tech) of the City University of New York, I was afforded the opportunity of becoming a member of the Department of Energy’s Faculty and Student Teams Program (FaST) hosted by the Office of Educational Programs at the Brookhaven National Laboratory (BNL). Little did I know just how much of a career building stepping stone this opportunity would become.

As members of the FaST team in 2004, two of my City Tech students and I conducted research on “Mercury Deposition from Coal-Fired Power Plants” with BNL scientist Dr. Terry Sullivan. Not only were we able to conduct plume dispersion modeling experiments at BNL, we also traveled to Springfield, Illinois to collect soil and vegetation samples from regions in close proximity to two major coal-fired power plants. The research trip was novel and very exciting for both my students and me. We were afforded real, hands-on training and research experience. This research project culminated in one of my first peer-reviewed journal publications as a junior faculty. [1]

I returned to the FaST program in the summer of 2005. This time I brought along three other City Tech students with me, and we conducted research on “Temperature Measurements and Temperature Sensors” with BNL scientist Dr. Michael Reynolds. At that time, Dr. Reynolds was a lead scientist with the Urban Dispersion Program (UDP), a program administered by the Department of Homeland Security, the National Oceanic and Atmospheric Administration (NOAA), BNL, and New York City’s Office of Emergency Management. The UDP had just designed a project to examine the dispersion of airborne materials within the deep street canyons, into modern office buildings, and through the subway system of New York City. The project was executed by controlling the release of non-toxic “tracer” gases into the environment around mid-Manhattan and then monitoring their dispersion using a total of 158 integrating tracer samplers and 9 fast-response tracer analyzers deployed at street-level. The UDP conducted two field campaigns that involved more than 25 organizations and over 250 people. Approximately 30% of the participants were students from universities and colleges around NYC. I participated in both
field campaigns as the key research person in charge of student tracer deployments and measurements. One practical extension of the UDP research effort in NYC was the decision to establish a permanent meteorological network in NYC (NYC MetNet) based on the equipment used in these two field studies and the addition of a radar wind profiler to provide a routine profile of winds up to 2.5 km/h. The NYC MetNet has now been expanded and is under the control of NOAA-CREST, NOAA’s premier satellite and ground-based, remote sensing center headquartered at the City College of New York. I have been an active member of NOAA – CREST from its very inception in 2001, and I am an active member of its NYC MetNet group.

As a direct result of the BNL Urban Dispersion Program I was part of during the Summer 2005 FaST program, I have introduced elements of plume dispersion modeling in an urban setting in one of my physics courses.
–Reginald Blake, New York – New York City College of Technology

My career both as a professor of physics and as a research scientist has benefited from my involvement in the FaST program. The professional contacts I have established, along with the many collaborative efforts, the continued support of the Office of Educational Programs at BNL, the exposure and the experiences I have encountered have all converged to mold and to shape my career positively. My involvement with the FaST program and the exposure gained from the two summer activities with my City Tech students were instrumental in my becoming a tenured professor in September 2008. Further, I am now being considered for promotion to associate professor.

The FaST program gave me the confidence and the poise to embrace all aspects of the professoriate and all types of research endeavors. It was through the FaST program that I was first introduced to grant writing, particularly the writing of grants to the National Science Foundation (NSF). The NSF video conference sessions that I attended as a member of the FaST program gave me the assurance and the skills necessary to write strong proposals. Today, thanks in part to the FaST program, I have developed into a prolific grant writer. In the last four years, as Principal Investigator, Senior Personnel, or Advisor, I have been involved with grants that have garnered over $14,725,412, and I am currently involved with pending grants (as PI, co-PI, Senior Personnel, or Advisor) that amount to $26,066,616.

Not only have I been successful with grant writing, but the FaST program has also helped me to become a leader in academia and research. I currently lead City Tech’s Project Kaleidoscope’s Inter-Disciplinary project, and I am the project director of my institution’s Black Male Initiative program, a project that has been nationally recognized as a Model Replication Institution program for the STEM disciplines. Additionally, in the summer of 2008, I was selected by Mayor Michael Bloomberg to join New York City’s expert panel on Climate Change.

This panel of scientific experts has been charged with the responsibility of providing the climate change science that will underpin New York City’s climate change policy for decades to come. It is, therefore, in no small part that I express my gratitude to the FaST program for planting the seeds of success for my academic career. I am also deeply indebted to the BNL Office of Educational Programs and, particularly, Mr. Noel Blackburn for recruiting and nurturing me. Mr. Blackburn has played a critical role in my development as a scholar, and I must offer my sincere and profound thanks to him. My collaboration with the FaST Program is by no means over. I expect to continue and to strengthen my ties to it. While there is much work still to be done and greater heights to attain, whatever further success I may achieve in my academic pursuits can all be traced back to my involvement with the Department of Energy’s FaST program sponsored by the Office of Educational Programs at Brookhaven National Laboratory.

New Orleans FaST team joins with BNL and Dowling College professor to profile the Long Island Pine Barrens

By Kristen Dorans (2008 BNL SULI science writing intern)

When Murty Kambhampati of Southern University of New Orleans (SUNO) arrived at BNL along with two SUNO undergraduate students, Jeffrey Ambrose and Nyesha Smith, as the 2008 FaST team from SUNO, they joined up with Vishal Shah, a Dowling College professor, to map the community-level physiological microbial profile of the Long Island Pine Barrens. The research, the first-ever project of this type in the world, is supported by DOE's Office of Workforce Development for Teachers and Scientists through its Faculty and Student Teams Program (FaST), the National Science Foundation's Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), and the U.S. Department of Education's Minority Science & Engineering Improvement Program (MSEIP). Tim Green, who manages BNL's natural and cultural resources, and Noel Blackburn, an educational programs administrator at BNL's Office of Educational Programs (OEP), facilitated this collaboration at BNL.

In addition to contributing new findings to the field of microbiology, the research brought together BNL scientists, faculty from Dowling College, a small liberal arts school in New York, and students and faculty from SUNO, an HBCU school.

"The collaboration provides research opportunities not only for the professors, but for the students as well," Green said. "It is important that we develop researchers from schools where they otherwise might not have had a chance to do research."

Dowling’s Vishal Shah has been collaborating with Green on the project for the past two years. This past year Kambhampati’s FaST team joined Green and Shah to collaborate on this Pine Barrens mapping project.

"My goal as a faculty member is to motivate under-represented students by exposing them to state-of-the-art science and technology in the field of environmental science," Kambhampati said. "That’s why we formed this collaboration. Our team has had a great experience working with Dr. Shah. He is an enthusiastic mentor and an excellent team player."

While at BNL, the FaST team went out in the field to take soil samples throughout the Pine Barrens from strategically mapped, permanent, forest health spots established by the Foundation for Ecological Research in the Northeast (FERN). They took soil layers
from three different levels and brought them back to Dowling for analysis. This project, which will provide more information about the health of the Pine Barrens, might also lead to the discovery of new microbes with potential medicinal properties, Kambhampati explained.

“We took the challenge and so far the research has been successful,” he said. “We look forward to making it a more meaningful project both scientifically and educationally.”

Shah noted that this collaboration gives students confidence. “Even if you are in high school or an undergrad, if you believe in yourself, you can do wonders,” he said.

Ambrose and Smith, both of whom plan on pursuing combined M.D./Ph.D. degrees after completing their undergraduate degrees in biology, have benefited from their first research experience.

“Jeff and Nyesha have great potential and talent,” Shah said. “By getting this research exposure and working with professors like Dr. Kambhampati, I am sure that they will succeed in their future careers.”

“It has been a fulfilling experience,” Ambrose said. “It’s a lot of hard work, but we’re up to the challenge.”

Smith added that this summer helped solidify her future. “It has made me love research even more,” she said. “Now I know what to expect in this field.”

As a result of his mentoring activities at SUNO, Kambhampati received the 2008 Minority Access, Inc., National Faculty Role Model Award. Additionally, Carmen Maldonado, one of his students and a BNL 2008 SULI Intern, also received a Minority Access, Inc., National Student Role Model Award for her excellence in academics and research. This was a first in the history of SUNO. Dr. Kambhampati has also assisted his students in publishing papers in peer-reviewed, refereed journals and research abstracts in local, regional, national and international conference proceedings. These students have presented in more than twenty conferences across the United States over the past three years, and some have won awards for their excellence in poster and oral presentations.

The first annual Science and Energy Research Challenge (SERCh), sponsored by the Department of Energy’s (DOE) Office of Science, was held on November 9-10, 2008, at Oak Ridge National Laboratory. Eighty-five undergraduate students, twelve of whom completed a 2008 summer internship at BNL, were selected to participate in this prestigious and highly competitive National poster competition. Of those selected from BNL, five were Kambhampati’s SULI students. They included Jeffrey Ambrose and Nyesha Smith from the 2008 FaST Pine Barrens project as well as Ha’Wanna St. Cyr, Carmen Maldonado and Tyra Bunch.

As a result of their BNL FaST experience, the students who were on my team are more focused, self-confident, and motivated to attend graduate and/or professional schools as they pursue their career choices.

— Murty Kambhampati, Louisiana – Southern University at New Orleans

– Murty Kambhampati, Louisiana – Southern University at New Orleans
Many things have been said about the value of mentoring, and in some sense not much can be added. A mentor is someone who is interested in the first steps of developing a student into a professional. There are many lessons that must be taught. For example, “Don’t listen to orthodox explanations.” Well, maybe listening is okay, but believing all you hear isn’t okay. “Find the courage to stick to your conclusions.” “Don’t get discouraged when mistakes are made.” “Understand what you are doing, and if things don’t work you must evaluate what you did and make sure it’s correct.” The list goes on and on, and in some sense a mentor must get the student through these obstacles.

In fact they are not obstacles, but really become a mindset for a scientist. Even though I could probably find more things to enumerate, I must emphasize that the most important thing to leave with a student is the sense of adventure in science, to try something no one has ever tried, and ultimately if your experiment or calculation goes well, to realize that you know more about something than anyone else in the world.

There was a very amazing surprise that happened a couple of summers ago. Noel Blackburn in our Office of Educational Programs indicated that he had a candidate in the Faculty and Student Team (FaST) program that might be a match for me, and I was interested. After looking at the credentials of Abebe Kebede of North Carolina A&T, he seemed to have experience in my area and I had a good project for him and his students. What’s interesting is that in looking at his credentials he had reasonable publications, and better yet he got his Ph.D. with Jack Crow at Temple University. Jack Crow was a remarkable scientist with the vision to create the National High Magnetic Field Laboratory in Tallahassee Florida. Tragically, Jack died in September of 2004 from pancreatic cancer. The memorial service information says that “The National High Magnetic Field Laboratory is truly the house that Jack built.” It couldn’t be put better.

So in the summer of 2004, Abebe Kebede, his students, and I agonized over Jack, as well as measuring the conductivity of percolating gold clusters. Interestingly, I had hired Jack when he left graduate school; we worked together for many years before he went to Temple. So, in some sense, Abebe, Jack’s student, is really...
my scientific “grandson,” which of course makes me a great-grandfather to Chris Jes-samy and Tanina Bradley, the students who accompanied Abebe from North Carolina. Having a part in this as a mentor has been a great source of satisfaction for me as I see the excitement of science passed on to new generations.

There is another interesting aspect to this story, and that is the value of the FaST program where minority students can take part in some of the things that go on at a great laboratory. They can see ideas flying around, some good and some bad, and they get the feeling of how science is done and whether this is what they want as a career. It’s important to them, and it’s important to America. In looking through the Web, I noticed that Chris and Tanina expanded some of the work they did here and presented it in the University of North Carolina Student Research Program. I gather that Tanina is finishing up at the University of North Carolina at Charlotte and Chris is about to graduate from North Carolina A&T. I like to think that somehow we all came together through Jack.

The students were able to participate in the doing of science. This is important for any future scientist or science teacher. The students realized that in science you do not always know the “right” answer and that it requires long hours, hard work, and persistence.

– Rita Hagevik, Knoxville, Tennessee – The University of Tennessee

71% of the FaST professors plan to increase their research opportunities for others
It Goes by FaST!
by Onarae Rice, Furman University

Some people are born knowing what they will become. Others succumb to parental influence and pursue medicine or law. Then there are those that like a flowing stream do not know where the next bend will take them, but they flow, purposefully, nonetheless. I am the latter. I didn’t always know what I wanted to do with me life. I had so many interests and surely science was one of them. Fortunately, educational programs were, and still are, available to shape the direction of the youth in this country.

As a junior at Wofford College in Spartanburg South Carolina, I really enjoyed science. I worked as a research assistant in the Dr. Scott’s lab and from the moment I created my first graph, I was hooked. I still did not know which area of research I wanted to focus my efforts, but it was clear to me that I loved it and that I needed further direction. Dr. Scott encouraged me to apply to the Science and Engineering Research Semester (SERS) program at Brookhaven National Laboratory (BNL). SERS proved to be the singular, career-defining moment in my life. It cemented my love for science and made the career more tangible and, ultimately, more attainable. Not only did it do this for my career, it shaped my personally – I saw the world differently.

I arrived at BNL for the first time in 1995 during the second semester of my junior year. I’d never been north of the Mason-Dixon Line and I’d certainly never worked at a place with such esteem. My first project was in the Medical Department with Dr. Seichii Yasumura where we worked in conjunction with St. Luke’s–Roosevelt Hospital in Manhattan to measure total body elemental composition in order to track the deterioration of muscle and other features in HIV-positive and obese patients. Although this project involved medical physics, something I then knew nothing about, it allowed me to learn a great deal and reaffirmed to me why people dedicate their lives to science: to help others.

After completing the semester internship, I reapplied for the summer version of SERS and was accepted to work further on the same project. I felt compelled to finish, or at least, to continue what I had started. By then, I was tremendously invested in the science and the lives we were helping. My knowledge of medical physics grew. I became more confident, and I was introduced to many other research projects at BNL. The summer proved to be another great experience since I was entrusted with more responsibility. I was even invited to
After graduation from Wofford College, I had not planned to enter graduate school immediately because my mother was undergoing treatment for breast cancer. Nonetheless, I was asked to join the medical physics group at BNL as a Research Associate, and I accepted. There I was encouraged to look into a graduate program that fit my interest in case it was not medical physics. Within the ten years I spent at BNL (1996 – 2006), I worked as a Research Associate, obtained both a Master’s Degree and PhD in Biopsychology at Stony Brook University, completed a Post-Doc on a NASA funded project, and made life-long friends at BNL.

Now, as a faculty member at Furman University in South Carolina, I’m participating in yet another Department of Energy (DOE) program, the Faculty and Student Team (FaST) Program, one that affords university professors, along with a team of students, the opportunity to collaborate on research projects with scientists at a national laboratory like BNL. As a young faculty member like me, the FaST research experience is extremely valuable. Conducting top-notch research and obtaining funding are essential to my professional growth and development. BNL provides instant validation for both and makes these objectives more likely.

Through FaST, my students have the opportunity to discover their own passion. I have seen them fall more in love with science each day that they spend working in BNL’s collaborative research environment. Filled with pride, I’ve have watched them grow before my eyes.

I’m sure there are many stories like mine. FaST and programs like it are essential to the growth and stability of America’s firm place in science and engineering. They help to steer bright and diverse minds while instilling a sense of purpose. I’m forever indebted to DOE and BNL for its commitment to educational programs as they directed my path. As I write this, it is my hope that my students will have similar stories as their lives, like a stream, flow down their respective paths. I will remind them that like any good scientist they should take notes along the way because it goes by fast!
FaST collaboration opens career development path for students at BNL
By Kristen Dorans (2008 BNL SULI science writing intern)


Mentors Subramanyam Swaminathan, a BNL biologist whose recent research has resulted in finding an inhibitor for the deadly botulinum neurotoxin type A, and Ann Brown, a biology professor from Medgar Evers College in Brooklyn, are particularly interested in providing opportunities for the students they mentor to continue with research once they finish school. For example, Arshad Mahmood, a Medgar Evers graduate mentored by Swaminathan and Brown last summer, returned to work with Swaminathan as a biology associate for a year before attending medical school.

"We like to ensure that once students leave college, they still want to continue in science," Swaminathan said.

This Swaminathan/Brown program gives students from Medgar Evers, a teaching institution, a chance to join in high-level research. Then, they recruit their fellows. "The students go back and talk about their experience," Brown said. "That can influence others to want to go to a place like Brookhaven to pursue research."

The National Institute of Health Protein Structure Initiative II, New York Structural Genomix Consortium, supports Brown and Swaminathan’s team. Since Brown started working with Swaminathan last year, the team has used BNL’s National Synchrotron Light Source to determine three protein structures and is on its way to solving more.
CONVERSATION: Sharon Lall-Ramnarine and James Wishart

Sharon Lall-Ramnarine currently teaches in the Chemistry Department of Queensborough Community College. Bayside, NY, where she is an assistant professor who recently received tenure, in part as a result of her relationship with BNL. Additionally, she serves as the Director at Large for the New York section of the American Chemical Society and the Assistant Director for the New York Regional Alliance for Ionic Liquids. Her students have made numerous presentations at local and national scientific conferences, often winning prizes for best poster presentations. James Wishart has held the position of Chemist at BNL since 1987 and is the facility supervisor for BNL’s Laser-Electron Accelerator Facility (LEAF). He also hosted the first FaST team when BNL initiated the FaST program in 2003 and has continued to host FaST teams each summer since then.

How did you and Jim begin your collaboration?
Sharon Lall-Ramnarine: In 2000, while a doctoral student at Queens College my advisor, Robert Engel, and I published a paper on our work on ionic liquids that attracted the attention of BNL scientist James Wishart, who contacted us, interested in a collaboration. Beginning in January 2001, I began working in Jim’s lab at Brookhaven National Laboratory (BNL) intermittently. From the start, this collaboration was very beneficial to me. I was able to learn new techniques from Jim that really helped me in my thesis work. At BNL, I was also able to conduct some of the characterization of the compounds I synthesized. The compounds Jim was interested in studying helped to shape the direction of my thesis project. My collaboration with Jim has been continuous since then.

How did you first introduce your community college students to BNL?
Sharon Lall-Ramnarine: Even when I was a graduate student, I brought a couple of Queens College undergraduates I was co-mentoring to BNL every time I visited. They were always excited about working at BNL, and Jim was always a great mentor to them. After graduating in 2003, I joined the faculty at Queensborough Community College (QCC) in the spring of 2004. I continued to send Jim students to continue our collaboration even when I could not visit BNL myself.

Have there been any additional ways that you and Jim have developed your collaboration to include other researchers?
Sharon Lall-Ramnarine: In 2003, Jim and I were among the founding members of the New York Regional Alliance for Ionic Liquid Studies (NYRAILS). In 2004, we co-organized the first sympo-
The symposium attracted about 75 attendees from academia and industry including my chair and colleagues at QCC. It was very good exposure for me during my first semester as a new faculty member at QCC. In 2006 and 2007, we co-organized similar NYRAILS symposia at Queens College and Rutgers University, and in 2008 we co-organized the technical sessions on ionic liquids at the Middle Atlantic Regional Meeting of the American Chemical Society which was held at Queensborough Community College.

James Wishart: I would add that the NYRAILS group nucleated around the group of people Sharon contacted during her thesis work to accomplish her needed experiments. In that capacity, she blazed the trail for the links that became NYRAILS.

What benefits have you and your students derived from your involvement with the FaST program at BNL?

Sharon Lall-Ramnarine: From the summer of 2005, I began taking QCC students to BNL through the FaST program as well as the CCI program. In 2005 Jim and I published a paper of our work (Wishart, J. F., S. I. Lall-Ramnarine, R. Raju, A. Scumpia, S. Bellevue, and R. Ragbir. Spectra and solvation dynamics of the electron in ionic liquids. Radiat. Phys. Chem. 2005 72:99-104). The relatively close proximity of BNL to QCC allows the students to continue their work on a reduced schedule throughout the year.

How has FaST impacted your students and their pursuit of their own education or a career in science?

Sharon Lall-Ramnarine: I continued to take students to BNL through the OEP programs in 2006, 2007, and 2008, mentoring an average of five students per summer and a total of twenty over the four years. Most of the students become motivated to pursue scientific careers after their BNL experience. They all went on to pursue bachelor’s degrees and some are now applying to graduate school in chemistry.

This has allowed me to greatly expand and leverage my research capabilities because we can create and characterize any ionic liquid we need to further our research goals. Having a real research group full of students who work not only in the summer but also all year round has made it possible for me to compete and collaborate with academic scientists who have much greater resources at their disposal. This has opened many professional opportunities for me and allowed me to be considered a peer by top researchers in the field of ionic liquids.

And Sharon, how has your participation in the FaST program at BNL influenced your own professional career?

Sharon Lall-Ramnarine: Participating in the FaST program allowed me to take my research to a level that I could not duplicate on my home campus. It allowed Jim and me to train undergraduates to continue working on projects during the year when my teaching loads are heavy and I have very little time for research. With experienced undergraduates returning to work with us for a second and third year, we were able to spend more time applying for grants and writing up our results for publication. We currently have a paper submitted for publication (Sharon I. Lall-Ramnarine, Alejandra Castano, Marie Thomas, Gopal Subramaniam, and James F. Wishart. Synthesis, characterization and radiolytic properties of bis(oxalato) borate containing ionic liquids. Radiat. Phys. Chem. 2008), and in

“Being involved in the BNL FaST program has allowed me to stay current in my research field and to be involved in the most exciting and current research. I am able to bring this new knowledge to my classroom discussions and my research students. I am also able to take my research with my students to a level that I could not duplicate on my home campus. After the FaST experience many of my students decided to pursue science degrees and now consider graduate school as a career option. My BNL FaST mentor is a very valued collaborator who looks out for opportunities for me on a continuous basis.”

–Sharon Lall-Ramnarine, New York – Queensborough Community College
the summer of 2007, we submitted an Laboratory Directed Research and Development proposal with other scientists at BNL to convert lignocellulosic material to biofuels. Each summer at BNL I have accepted the invitation of the OEP program coordinators to give a lecture to students in the various OEP programs. Working at BNL for so many summers has also allowed me to form collaborations with other BNL scientists. I currently have another collaborative project with A. J. Francis in the BNL Environmental Science Department.

The students presented the research they conducted with us at several local, regional and national scientific meetings.

In 2006, the QCC Chemistry Department submitted an NSF STEP proposal utilizing the successful collaborative model Jim and I had involving undergraduate researchers at a national lab, a 2-year and 4-year institution. The proposal was funded for $2 million late in 2007. The first QCC students were funded to participate in BNL educational programs in the summer of 2008.

What outcome from FaST has affected your own professional growth?

Sharon Lall-Ramnarine: Overall this has been a mutually beneficial collaboration that has allowed me to grow professionally. It has allowed me to stay current in my research field, to work on exciting projects and to train my students on the most up to date equipment. Jim has been a fantastic mentor to both the students and me throughout the years. Recently, when I came up for tenure, the QCC Chemistry Department and the Office of Educational Programs at BNL were very supportive. I believe that my collaboration with Jim and participation in the FaST program played a major role in the decision of the college to award me tenure.

Jim and I have many other projects in the works and plan to submit additional papers for publication.

James Wishart: It has also been a pleasure to mentor Sharon and so many of her bright and engaging students. Through them I have been able to hone my skills as an educator, which I had not been able to use very much before in the national laboratory setting. It has also given me a perspective on science education, policy, and workforce issues that I would not have had if my nose had remained buried in just my research.
Growing Diversity through Synergy: The BNL Office of Educational Programs, FaST, and the Interdisciplinary Consortium for Research and Educational Access in Science and Engineering


Mentors Subramanyam Swaminathan, a BNL biologist whose recent research has resulted in finding an inhibitor for the deadly botulinum neurotoxin type A, and Ann Brown, a biology professor from Medgar Evers College in Brooklyn, are particularly interested in providing opportunities for the students they mentor to continue with research once they finish school. For example, Arshad Mahmood, a Medgar Evers graduate mentored by Swaminathan and Brown last summer, returned to work with Swaminathan as a biology associate for a year before attending medical school.

“We like to ensure that once students leave college, they still want to continue in science,” Swaminathan said.

This Swaminathan/Brown program gives students from Medgar Evers, a teaching institution, a chance to join in high-level research. Then, they recruit their fellows. “The students go back and talk about their experience,” Brown said. “That can influence others to want to go to a place like Brookhaven to pursue research.”


The formation and growth of the Interdisciplinary Consortium for Research and Educational Access in Science and Engineering (INCREASE) at BNL since the summer of 2007 exhibit the hallmarks of a program that brings together and establishes durable relations with new users for the state-of-the-art scientific instruments available at BNL. The consortium began as a vehicle for introducing the research opportunities available BNL’s National Synchrotron Light Source (NSLS) to faculty members from FaST teams, Historically Black College and Universities (HBCU), and Minority Serving Institutions (MSI). Through its annual workshops hosted at BNL, INCREASE has already developed a cooperative, team-based approach to developing new avenues of research that build a community of HSBFU and MSI researchers who collaborate on research projects of mutual interest at BNL, the common location for aspects of their research. The relationships between the consortiums members from HCBUs and MSIs incorporate a partnership opportunity with BNL researchers. The synergy generated by this community and its relationship to BNL offer the INCREASE members the tools to explore new avenues
of collaborative research by making the grants needed to support this research more competitive. The success of INCREASE's model for developing a new user base for advanced scientific instruments not only encourages its members at different institutions to engage each other, but also to consider BNL as well as other national laboratories as a collaborator in solving research problems together.

The INCREASE program continues to highlight BNL's own commitment to scientific productivity, diversity, and its local communities. In 2007, BNL's Office of Educational Programs (OEP) conceived and initiated a program that reached out to faculty members from BNL's FaST teams as well as faculty from Historically Black College and Universities (HBCU). The program, a collaboration composed of three BNL groups (NSLS, OEP, and the BNL Diversity Office) as well as three HBCUs, sought to develop a consortium of HBCU and MSI professors, including FaST faculty, to provide access to the NSLS for all tenured and tenure-track HBCU and MSI faculty. The annual workshops that have grown out of this initial collaboration have sought to achieve four primary objectives:

To expose HBCU and MSI research faculty to NSLS science,

To enhance the research capabilities of HBCU and MSI faculty,

To create a diverse pool of well-qualified candidates in synchrotron science, and

To assist in the development of competitive proposals for these HBCU and MSI faculty to allow them to become independent beamline users at the NSLS.

A product of the first annual workshop, INCREASE, strengthens existing research ties between BNL, HBCUs, and MSIs, including Hispanic Serving Institutions and Tribal Colleges, by establishing new, long-term relationships among these constituencies and BNL.

With its members acting as ambassadors, INCREASE has already begun to develop the number of professors and students introduced to synchrotron science. The consortium is designing a synchrotron curriculum that provides HBCU students with general knowledge about synchrotron science as well as hands-on experience. Eric Sheppard, Dean of the School of Engineering and Technology at Hampton University and Chairman of INCREASE, emphasized the consortium’s goal to “develop the scientists of the next generation when they’re undergraduates and give HBCU students exposure and an opportunity to have hands-on experience with cutting-edge research instrumentation and facilities that are not available at many of our institutions.” In this way, students will gain a competitive advantage early on and be prepared to become professionals and future users and/or employees at top research facilities like BNL.

Through this INCREASE collaboration, BNL endeavors to stress the importance of tapping into communities that are not adequately represented within DOE organizations. “If we are not committed to having them [HBCUs and MSIs] as part of our community, then
we at BNL cannot be certain that we have
the best talent, and in turn, are probably
not offering the world the best science," said BNL Diversity Office Manager Shirley
Kendall about INCREASE. While HBCUs are
often the target for outreach collaborations,
the NSLS-HBCU collaboration is about much
more than mere outreach. INCREASE pres-
ents its members with the opportunity to
form a community of researchers and share
ideas for further collaborations and national
laboratories. INCREASE also models how
HBCUs and MSIs can find a common ground
with other national laboratories to create partnerships that foster
collaborative research.

Four professors have already submitted successful NSLS beam
time proposals and have become full beamline users at the NSLS
facility. A short-term goal of INCREASE is to enroll at least one
beamline user at the NSLS from each school in the consortium. The
OEP, INCREASE’s HBCU and MSI faculty members, the NSLS chair-
man, staff and researchers have all committed themselves to make
this collaborative research opportunity work. INCREASE is now
developing sufficient relationships and structure to begin seeking
additional sources of funding to advance the research possibili-
ties offered by BNL’s NSLS. BNL itself plans
to continue to utilize existing educational
programs to bring in HBCU undergraduate
students for short term visits to the site and
is vigorously encouraging graduate students
to take advantage of the opportunity to
complete an internship at the NSLS facility
through the fully-funded Master of Science
in Instrumentation Fellowship program at
Stony Brook University, another partnership
outgrowth of the INCREASE consortium.

The NSLS-INCREASE collaboration is
successfully increasing awareness about
synchrotron research as well as training and enabling professors
to acquire the research skills and capabilities that will enable them
to expand their own scientific research at their home institutions.
By capturing the brightest talent and creating a diverse user com-
community for Light Source science at Brookhaven, we are building a
pipeline of future talent at BNL as well as creating professionals
and networks for the US scientific community as a whole. BNL is
excited to welcome back, annually, the familiar faces of INCREASE
and to meet new faculty and students from this community who
are eager to experience the cutting edge research facilities and
resources that BNL has to offer them.
Professor Profiles
Chronology of FaST at Brookhaven National Laboratory

2000
Department of Energy (DOE) initiates Faculty and Student Teams Program (FaST) at six DOE national laboratories.

2003
Brookhaven National Laboratory (BNL) sponsors its first FaST team from one school in New York.

Faculty Member | BNL Mentor | BNL Department | College/University
--- | --- | --- | ---
Kobrak, Mark | James Wishart | Chemistry | New York – Brooklyn College of CUNY

2004
BNL sponsors 5 FaST teams (5 faculty, 10 students) from five schools in four states.

Faculty Member | BNL Mentor | BNL Department | College/University
--- | --- | --- | ---
Reginald Blake | Terry Sullivan | Environmental Sciences | New York – New York City College of Technology
Abebe Kebede | Myron Strongin | Physics | NC – North Carolina A&T State University
Mark Kobrak | James Wishart | Chemistry | New York – Brooklyn College
Jyhcheng Liu | Carmen Benkovitz | Environmental Sciences | New Jersey – New Jersey City University
Elhang Shaban | D. Peter Siddons | NSLS | Louisiana – Southern U. College at Baton Rouge
BNL sponsors 10 FaST teams (10 faculty, 21 students) from ten schools in seven states.

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<tr>
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<th>BNL Mentor</th>
<th>BNL Department</th>
<th>College/University</th>
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<tbody>
<tr>
<td>Reginald Blake</td>
<td>Michael Reynolds</td>
<td>Environmental Sciences</td>
<td>NY – New York City College of Technology</td>
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<td>Rita Hagevik</td>
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<td>NC – North Carolina A&amp;T State University</td>
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<td>Maureen Krause</td>
<td>John Dunn</td>
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<td>Sharon Lall-Ramnarine</td>
<td>James Wishart</td>
<td>Chemistry</td>
<td>New York – Queensborough Community College</td>
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<td>Jyhcheng Liu</td>
<td>Douglas Wright</td>
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<td>Sanjay Malhotra</td>
<td>A. J. Francis</td>
<td>Environmental Sciences</td>
<td>New Jersey – New Jersey Institute of Technology</td>
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<td>Ray O’Neal</td>
<td>Helio Takai</td>
<td>Physics</td>
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<td>Seydou Samake</td>
<td>Louis Pena</td>
<td>Medical</td>
<td>Georgia – Fort Valley State University</td>
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<td>D. Petere Siddons</td>
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<td>Sam Subramanian</td>
<td>Terry Sullivan</td>
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BNL sponsors 14 teams (14 faculty, 28 students) from thirteen schools in seven states.

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<td>Hirendra Banerjee</td>
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<td>Wenyi Bi</td>
<td>Sean McCorkle</td>
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<td>Hazem Tawfik</td>
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<td>Jiufeng Tu</td>
<td>Myron Strongin</td>
<td>Physics</td>
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<td>Lori Zaikowski</td>
<td>John Miller</td>
<td>Chemistry</td>
<td>New York – Dowling College</td>
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BNL sponsors 10 teams (10 faculty, 18 students) from nine schools in five states.

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<td>Joanna Fowler</td>
<td>Medical</td>
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<td>S. Swaminathan</td>
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<td>Suzanne Seleem</td>
<td>Richard Hahn</td>
<td>Chemistry</td>
<td>Ohio – Central State University</td>
</tr>
<tr>
<td>Elhang Shaban</td>
<td>D. Petere Siddons</td>
<td>NSLS</td>
<td>Louisiana – Southern University at Baton Rouge</td>
</tr>
<tr>
<td>Hazem Tawfik</td>
<td>Devinder Mahajan</td>
<td>Energy Sciences &amp; Technology</td>
<td>New York – Farmingdale State College</td>
</tr>
<tr>
<td>Lori Zaikowski</td>
<td>John Miller</td>
<td>Chemistry</td>
<td>New York – Dowling College</td>
</tr>
</tbody>
</table>
BNL sponsors 11 teams (11 faculty, 22 students) from 11 schools in seven states.

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>BNL Mentor</th>
<th>BNL Department</th>
<th>College/University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thomas Abe</td>
<td>John Heiser</td>
<td>Environmental Sciences</td>
<td>North Dakota — Fort Berthold Community College</td>
</tr>
<tr>
<td>Shawn Abernathy</td>
<td>James Wishart</td>
<td>Chemistry</td>
<td>District of Columbia — Howard University</td>
</tr>
<tr>
<td>George Armstrong</td>
<td>Devinder Mahajan</td>
<td>Energy Sciences &amp; Technology</td>
<td>Mississippi — Tougaloo College</td>
</tr>
<tr>
<td>Ann Brown</td>
<td>S. Swaminathan</td>
<td>Biology</td>
<td>New York — Medgar Evers College</td>
</tr>
<tr>
<td>Murty Kambhampati</td>
<td>Tim Green</td>
<td>Environmental Protection</td>
<td>Louisiana — Southern University at New Orleans</td>
</tr>
<tr>
<td>Sharon Lall-Ramnarine</td>
<td>James Wishart</td>
<td>Chemistry</td>
<td>New York — Queensborough Community College</td>
</tr>
<tr>
<td>Ray O’Neal</td>
<td>Paul O’Connor</td>
<td>Instrumentation Division</td>
<td>Florida — Florida A&amp;M University</td>
</tr>
<tr>
<td>Varattur Reddy</td>
<td>David C. Grills</td>
<td>Chemistry</td>
<td>New York — Kingsborough Community College</td>
</tr>
<tr>
<td>Elhang Shaban</td>
<td>D. Petere Siddons</td>
<td>NSLS</td>
<td>Louisiana — Southern University at Baton Rouge</td>
</tr>
<tr>
<td>Hazem Tawfik</td>
<td>Devinder Mahajan</td>
<td>Energy Sciences &amp; Technology</td>
<td>New York — Farmingdale State College</td>
</tr>
<tr>
<td>Ju Xin</td>
<td>Trevor Sears</td>
<td>Chemistry</td>
<td>Pennsylvania — Bloomsburg U. of Pennsylvania</td>
</tr>
</tbody>
</table>
### 2009

BNL sponsors 25 teams (25 faculty, 52 students) from 22 schools in 13 states

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>BNL Mentor</th>
<th>BNL Department</th>
<th>College/University</th>
</tr>
</thead>
<tbody>
<tr>
<td>George Armstrong</td>
<td>Devinder Mahajan</td>
<td>Energy Sciences &amp; Technology</td>
<td>Mississippi – Tougaloo College</td>
</tr>
<tr>
<td>Jin Bakalis</td>
<td>John Miller</td>
<td>Chemistry</td>
<td>New York – Queensborough Community College</td>
</tr>
<tr>
<td>Ann Brown</td>
<td>S. Swaminathan</td>
<td>Biology</td>
<td>New York – Medgar Evers College</td>
</tr>
<tr>
<td>Florence Etop</td>
<td>Thomas Butcher</td>
<td>Energy Sciences &amp; Technology</td>
<td>Virginia – Virginia State University</td>
</tr>
<tr>
<td>Gabriel Gwanmesia</td>
<td>Lisa Miller</td>
<td>NSLS</td>
<td>Delaware – Delaware State University</td>
</tr>
<tr>
<td>Tequila Harris</td>
<td>Devinder Mahajan</td>
<td>Energy Sciences &amp; Technology</td>
<td>Georgia – Georgia Institute of Technology</td>
</tr>
<tr>
<td>Seojo Jang</td>
<td>John Miller</td>
<td>Chemistry</td>
<td>New York – Queensborough Community College</td>
</tr>
<tr>
<td>Gilbert John</td>
<td>Dev Chidambaram</td>
<td>Environmental Sciences</td>
<td>Oklahoma – Oklahoma State University</td>
</tr>
<tr>
<td>Widera Justyna</td>
<td>Charles Black</td>
<td>CFN</td>
<td>New York – Adelphi University</td>
</tr>
<tr>
<td>Murty Kambhampati</td>
<td>Tim Green</td>
<td>Environmental Protection</td>
<td>Louisiana – Southern University at New Orleans</td>
</tr>
<tr>
<td>Abebe Kebede</td>
<td>David Grills</td>
<td>Physics</td>
<td>NC – North Carolina A&amp;T State University</td>
</tr>
<tr>
<td>Hakeem Olusseyi</td>
<td>Andrew Becker</td>
<td>U. of Washington Astronomy</td>
<td>Florida – Florida Institute of Technology</td>
</tr>
<tr>
<td>Ray Oneal</td>
<td>Paul O’Connor</td>
<td>Instrumentation</td>
<td>Florida – Florida A&amp;M University</td>
</tr>
<tr>
<td>William Powell</td>
<td>Mickey Chiu</td>
<td>Physics</td>
<td>Maryland – Morgan State University</td>
</tr>
<tr>
<td>Varattur Reddy</td>
<td>David Grills</td>
<td>Chemistry</td>
<td>New York – Kingsborough Community College</td>
</tr>
<tr>
<td>Onarae Rice</td>
<td>Peter Thanos</td>
<td>Medical</td>
<td>South Carolina – Furman University</td>
</tr>
<tr>
<td>Carol Scarlett</td>
<td>Yannis Semertzidis</td>
<td>Physics</td>
<td>Florida – Florida A&amp;M University</td>
</tr>
<tr>
<td>Dereje Seifu</td>
<td>Dario Arena</td>
<td>NSLS</td>
<td>Maryland – Morgan State University</td>
</tr>
<tr>
<td>Elhag Shaban</td>
<td>David Siddons</td>
<td>NSLS</td>
<td>Louisiana – Southern University at Baton Rouge</td>
</tr>
<tr>
<td>Peter Spellane</td>
<td>S. Swaminathan</td>
<td>Chemistry</td>
<td>New York – New York City College of Technology</td>
</tr>
<tr>
<td>Mangala Tawde</td>
<td>Paul Freimuth</td>
<td>Biology</td>
<td>New York – Queensborough Community College</td>
</tr>
<tr>
<td>Hazem Tawfik</td>
<td>Devinder Mahajan</td>
<td>Energy Sciences &amp; Technology</td>
<td>New York – Farmingdale State University</td>
</tr>
<tr>
<td>Jiufeng Tu</td>
<td>Qiang Li</td>
<td>Physics</td>
<td>New York – City College of New York</td>
</tr>
<tr>
<td>Barbara Wilson</td>
<td>Lisa Miller</td>
<td>NSLS</td>
<td>Mississippi – Jackson State University</td>
</tr>
<tr>
<td>Zhigang Xiao</td>
<td>Elaine DiMasi</td>
<td>NSLS</td>
<td>Alabama – Alabama A&amp;M University</td>
</tr>
<tr>
<td>Ju Xin</td>
<td>Trevor Sears</td>
<td>Chemistry</td>
<td>Pennsylvania – Bloomsburg U. of Pennsylvania</td>
</tr>
</tbody>
</table>
**Thomas A. Abe**  
Instructor  
Science Department  
Fort Berthold Community College  
New Town, ND  
Total Years Teaching 4

**Education**  
Minot State College  
BA 1968 Chemistry  
University of North Dakota  
BS 1976 Medicine

**Positions and Employment**  
1998 - 2001  
Columbia University: NASA/GISS  
Post - Doctoral Fellow  
1999 - 2001  
Research Assistant Professor – CCNY  
2001 - 2004  
City Research Scientist –  
NYC Department of  
Environmental Protection  
2001 - present  
Research Scientist – NOAA  
Cooperative Remote Sensing Science and Technology Center  
2003 - present  
Assistant Professor of Physics –  
New York City College of Technology  
2004 - present  
Visiting Research Scientist –  
Brookhaven National Laboratory

**Pedagogy and Research**

**Classes Taught (Both Lecture and Laboratory)**
Recent Fort Berthold Community College classes: chemistry, anatomy, environmental science, ecology, physics

**New Courses Developed**
Field Research II (Bio 232) Tribal College University Program

**Research Interests**
Environmental Science, Air Quality Research, Energy and Environmental Development

**Existing Institution Research Laboratory or Research Center**
Name of Research Laboratory/Center  
Pending possible NSF MRI competitive grant

**BNL Experiences**
2008  
**Mentor**  
John Hieser  
**Project Name**  
Atmospheric Trace Gas Analysis (using PFTs)  
**Students Participating**  
2

**Recent Publications**

**Recent Grants**
Submitted  
Abe, Thomas, PI. Major Research Implementation. NSF. 2009.

**Professional Enrichment**

**Collaborators**
Bob Pieri, Mechanical Engineer, North Dakota State University and David Gemmill, Air Quality Consultant

**Synergistic Activities or Collaborations**
Collaboration on the currently reviewed NSF MRI Fort Berthold Community College Air Quality Research Monitoring Project
George Armstrong
Professor
Chemistry Department
Tougaloo College
Tougaloo MS
Total Years Teaching 18

Education
Akron University, PhD
1973 Polymer Science
Atlanta University, MS
1965 Chemistry
Knoxville College, B.S
1960 Chemistry

Positions and Employment
2001–2008
Tougaloo College, Professor
1999–2001
Tevco, Inc., Research Scientist
1994–1999
Revlon Research Center, Research Manager
1982–1999
Alcoa Technical Center, Research Manager
1978–1982
LOF Technical Center, Group leader
1972–1978
Union Carbide Research Center, Research Scientist

Pedagogy and Research
Classes Taught (Both Lecture and Laboratory)
Organic Chemistry I & II, Organic Chemistry Lab I & II, Polymer Chemistry

New Courses Developed
Organic Chemistry I & II, Organic Chemistry Lab I & II, Polymer Chemistry

Research Interests

Existing Institution Research Laboratory or Research Center
Name of Research Laboratory/Center Department of Homeland Security, National Transportation Security, Center of Excellence
General Description Research on and train in transportation security
Number of Participants Three institutions
Funding Agency/Agencies DHS
Role Intern Director

BNL Experiences
2004
Mentor Devinder Mahajan
Project Name Catalyzed Conversion of Methanol into Higher Oxygenates; Effect of Direct Oxidation of Methanol, Ethanol, Propanol and Mixed Alcohol Feeds on the Proton Exchange Membrane (PEM) Fuel Cell Performance
Students Participating 2

Research Mentoring (Summation)
<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
<th>Outcomes of Special Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>15</td>
<td>Professor gave four presentation and student gave eight poster presentation</td>
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Recent Grants
Submitted Seven grants

Professional Enrichment
Institution/Departmental Committee Memberships
General Education Committee

Professional Memberships
ACS and NOBCChE

Collaborators
Dr. Devinder Mahajan (BNL/SBU Joint Appointment)
Reginald A. Blake
Assistant Professor, Physics
New York City College of Technology, CUNY
Brooklyn, NY
Total Years Teaching 21

Education
City College of New York, BS
1987 Meteorology
City College of New York, MA
1990 Meteorology and Physical Oceanography
City University of New York, PhD
1998 Hydro-Climatology and Water Resources

Positions and Employment
2004–present
Visiting Research Scientist
Brookhaven National Laboratory
2003–present
Assistant Professor of Physics
New York City College of Technology
2001–present
Research Scientist
NOAA Cooperative Remote Sensing Science and Technology Center
2001–2004
City Research Scientist
NYC Department of Environmental Protection
1999–2001
Research Assistant Professor
CCNY

Pedagogy and Research
Classes Taught (Both Lecture and Laboratory)
Introductory Physics Courses - both Lecture and Laboratory

New Courses Developed
1. An Introduction to the Physics of Natural Disasters
2. Natural Disasters and Construction

Research Interests
Meteorology, Climatology, Hydrology, Climate Change Impacts, Satellite and Ground-Based Remote Sensing of the Environment: hurricanes, soil moisture, vegetation, air pollution

Existing Institution Research Laboratory or Research Center
Name of Research Laboratory/Center
NOAA-CREST; NASA/Goddard Institute for Space Studies; Urban Climate Change Research Network

Funding Agency/Agencies
NOAA; NASA

Role
Research Scientist

BNL Experiences
2004
Mentor
Dr. Terry Sullivan
Project Name
Local Mercury Deposition from Coal-Fired Power Plants, Case Study: Kincaid, Illinois
Students Participating
2

2005
Mentor
Dr. Michael Reynolds
Project Name
An Inter-Comparison Study to Evaluate the Discrepancy in the Measurement of Air Temperature
Students Participating
3

2006
Mentor
Dr. Michael Reynolds
Project Name
Urban Dispersion Modeling Program
Students Participating
2

Research Mentoring (Summation)

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
<th>Outcomes of Special Interest</th>
</tr>
</thead>
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<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>33</td>
<td>Two students went on to pursue the Ph.D. degree</td>
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<tr>
<td>Masters</td>
<td>Advisor</td>
<td>5</td>
<td>Pursuing the Ph.D degree</td>
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<td></td>
<td>Committee Member</td>
<td>2</td>
<td>Currently working as a post-doc fellow at NOAA-CREST</td>
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<tr>
<td>Doctorate</td>
<td>Advisor</td>
<td>2</td>
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</tr>
<tr>
<td>Post-Doctorate</td>
<td>Committee Member</td>
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</table>
Reginald A. Blake

Recent Grants


———, Senior Internal Advisor. ADVANCE. NSF. $250,000 per year. September 2008–August 2011.


———, Co-PI. Environmental satellite remote sensing. NOAA. $12,500,000.00. October 1, 2006–September 30, 2011.


———, Co-PI and Program Director. Increasing the enrollment and success of African-American male students in science, technology, engineering, and mathematics (STEM). City University of New York. $130,000 for one year. September 2008–August 2009.

———, Co-PI and Program Director. Increasing the enrollment and success of African-American male students in science, technology, engineering, and mathematics (STEM). City University of New York. $130,000 for one year. September 2007–August 2008.


———, Co-PI and Program Director. Increasing the enrollment and success of African-American male students in science, technology, engineering, and mathematics (STEM). City University of New York. $65,000 for one year. January–December 2006.


———, Co-PI in Collaboration with CCNY. NOAA’s Environmental Entrepreneurship Program. $200,000 per year for four years. September 2004–August 2008.


———, Co-PI. Faculty Development Grant. City University of New York. $10,000. September 2008–August 2008


Professional Enrichment

Institution/Departmental Committee Memberships
Commitees: College Council, Budget, Grants, Pluralism and Diversity, Retention, Recruitment, Dean’s Search, Sustainability, Curriculum, Course Coordinator, Laboratory

Professional Memberships
American Physical Society; American Meteorological Society; American Water Resources Association; American Geophysical Union

Honors and Awards
2008 - Selected to New York City Panel of Experts on Climate Change by Mayor Bloomberg
2009 - Featured in Who’s Who in America

Collaborators
Drs. William Russel; Cynthia Rosenzweig, Reza Khanbilvardi, Charles Vorosmarty; Fred Moshary; Johnny Lou

Synergistic Activities or Collaborations
Climate Change Impacts Study on NYC with Dr. Rosenzweig and NASA/GISS
Climate Change Impacts Study on Global Cities with Dr. Rosenzweig and the Urban Climate Change Research Network
Satellite Remote Sensing Applications to Hydrology, Hurricanes, Climatology being conducted at NOAA–CREST.
Recent Publications


Rita Hagevik  
Assistant Professor of Science Education  
Department of Theory and Practice in Teacher Education  
The University of Tennessee  
Knoxville, TN  
Total Years Teaching 4

Education  
Meredith College, Raleigh, NC  
BS  
1989  Biology

North Carolina State University  
MS  
1999  Science Education

North Carolina State University  
PhD  
2003  Science Education

North Carolina State University  
PhD comajor  
2003  Forestry

Positions and Employment  
2006–present  
Univ. of TN, Asst. Prof. of Science Ed.

2004–2006  
NC A&T State University, Asst. Prof. Science Ed. in Biology Department

2003–2004  
NC Partnership for Mathematics and Science, UNC system

Pedagogy and Research  
Classes Taught (Both Lecture and Laboratory)  
NCA&T. Comparative Vertebrate Anatomy, Environmental Biology, Biology I (for majors), Methods in Science Education

Univ. of TN. Science in the Natural Environment, the Nature of Mathematics and Science, Theoretical Foundations in Environmental Education, Elementary Science Methods, Advanced Research in Science Education, Internship in the Middle Grade

New Courses Developed  
All of these course I developed from the beginning

Research Interests  
Outdoor and Environmental Education, Geographic Information Systems, Nature of Science

Existing Institution Research Laboratory or Research Center  
Name of Research Laboratory/Center  
Department of Homeland Security, National Transportation Security, Center of Excellence

Funding Agency/Agencies  
DHS

Role  
Interim Director

BNL Experiences  
2005

Mentor  
Timothy Green and Mark Furhmann

Project Name  
Comparative Analysis of Soil and Water Chemistry Associated with Selected Wetland Habitats in the Long Island Pine Barrens

Students Participating  
2

Research Mentoring (Summation)  

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>75</td>
</tr>
<tr>
<td>Masters</td>
<td>Advisor</td>
<td>6</td>
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<tr>
<td>Doctorate</td>
<td>Committee Member</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Advisor</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Committee Member</td>
<td>5</td>
</tr>
</tbody>
</table>
Rita Hagevik

**Recent Grants**

Boger, D., PI; R. Hagevik, P. Powers, and A. Bugbee, co-PI. Teacher Professional Continuum, Content mentoring and its impact on middle grades mathematics and science teacher effectiveness. NSF. $2,000,000. 2006–2010.


———, PI. Comparative analysis of soil and water chemistry associated with coastal plain goods. NSF/NC–LSAMP Supplemental Award, Brookhaven National Laboratory. $21,500. 2005.

———, PI. Faculty Development Award. NC A & T State University. $1,500. 2005.


Tang, G., PI; R. Hagevik, G. Gayle, D. Dunn, and P. Fersner, co-PI. Development of an integrated multidisciplinary GIS and remote sensing education and research training program. NASA. $100,000. 2005–2006.

**Recent Publications**


———, D. Hales, and J. Harrell. 2007. GIS Live and web problem solving. Meridian Middle Schools Technology Journal 10 (2).


**Professional Enrichment**

**Institution/Departmental Committee Memberships**

**Professional Memberships**

- American Educational Research Association
- American Geophysical Union
- Association of Science Teacher Educators
- International Organization for Science and Technology Education
- National Association for Research in Science Teaching
- National Association of Professors of Middle Level Education
- National Center for Teaching Thinking
- National Middle School Association
- National Science Education Leadership Association
- National Science Teachers Association
- North American Association of Environmental Education
- Phi Beta Kappa
- Tennessee Environmental Education Association
- The Society for Conservation Biology

**Honors and Awards**

Selected and appointed by the Governor of North Carolina, Michael Easley, to the NC Geographic Coordinating Council, 2005–2006.


Best Poster, selected by a peer panel, Interdisciplinary Teaching with Geospatial Technologies, NCA&T Teaching and Learning Conference, Greensboro, NC, April 2005.

National Award, Global ReLeaf Award for Engineering Green from American Forests, San Antonio, TX, 2003.

Phi Delta Kappa, Raleigh, NC, 2002.

Preparing for the Professorate, selected by a national panel, North Carolina State University, Raleigh, NC, 2001–2002.

**Collaborators**

- College of Agriculture and Natural Resources, College of Arts and Sciences, Geology

**Synergistic Activities or Collaborations**

- North Carolina Center for Geographic Information Analysis, GIS Live online conference with NCDPI and other state agencies, The NC Museum of Art,
- IUSFS contract to develop conservation curriculum, Environmental Education and Teacher Exchange in Brazil through the University of Parana in Curitiba, Brazil
Murty S. Kambhampati
Professor of Biology
Natural Sciences Department
Southern University at New Orleans
New Orleans, LA
Total Years Teaching 20

Education
Addis Ababa University, BS
1982  Physics/Mathematics
Temple University, MA
1986  Physics
Temple University, PhD
1990  Physics

Positions and Employment
1998–present
Associate Professor
NC A&T State University
Assistant Professor
NC A&T State University
1990–1992
Visiting Assistant Professor
Temple University

Pedagogy and Research
Classes Taught (Both Lecture and Laboratory)
Introduction to Biology, General Biology, Plant Diversity, Morphology of Vascular Plants,
Genetics, Plant Physiology, Principles of Ecology, Advances in Ecology, Environmental
Biotechnology, Senior Seminars

New Courses Developed
Advances in Ecology and Environmental Biotechnology

Research Interests
Environmental Toxicology, Phytoremediation, and Environmental Microbiology/Biotechnology

Existing Institution Research Laboratory or Research Center
Name of Research Laboratory/Center  Scholarships for Excellence in Natural Sciences (SENS)
Funding Agency/Agencies  National Science Foundation
Role  Principal Investigator (Dr. Joe Omojola and Dr. Carl P. Johnson, Co-PIs)

BNL Experiences
2006
Mentor  Timothy Green
Project Name  Environmental Health of Peconic River Headwaters: Water and Sediment Chemistry
Students Participating  2

2007
Mentor  Timothy Green
Project Name  Comparative Ecological Study: Pine Barren Ponds of Long Island, NY
Students Participating  2

2008
Mentor  Drs. Timothy Green and Vishal Shah
Project Name  Microbial Community Mapping of Long Island’s Pine Barren Forest Soil
Students Participating  2

Research Mentoring (Summation)

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
<th>Outcomes of Special Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>~50 over 10 year period</td>
<td>Received mentoring/mentee awards at local and national levels. Students enrolled in graduate and professional schools.</td>
</tr>
<tr>
<td></td>
<td>Committee Member</td>
<td>LAMP/PES MaCT/MSEIP/SENS</td>
<td></td>
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</tbody>
</table>
Murty S. Kambhampatii

Recent Grants
———, PI. Supplemental grant to PESMaCT for FaST 2007 stipends at BNL. NSF. ~$30,000. 2008.
———, PI. Supplemental grant to PESMaCT for FaST 2007 stipends at BNL. NSF. ~$31,000. 2007.
———, Co-PI. Supplemental grant to PESMaCT to replace equipment. NSF. $100,000. 2006.
———, PI. Supplemental grant to PESMaCT for FaST 2006 stipends at BNL. NSF. $21,000. 2006.
———, Co-PI. Program for excellence in science, mathematics, and computer technology (PESMaCT). NSF. $2,600,000. 2001–2008.


Recent Publications

Professional Enrichment

Institution/Departmental Committee Memberships
Southern University at New Orleans/College of Arts and Sciences/Department of Natural Sciences

Professional Memberships
American Chemical Society (ACS)
World Wildlife Fund (WWF)
Nature Conservancy
Beta Beta Beta Biological Honor Society
Beta Kappa Chi National Scientific Honor Society
National Institute of Science.

Honors and Awards
2004 and 2005. Who’s Who Among America’s Teachers®
2005–2006. Chancellor’s Scholarship Cash Award ($500.00)
2007–2008. Chancellor’s Faculty Grantsmanship Cash Award ($500.00)
2006–2007. The National Society of Toxicology Undergraduate Student Advisor Award 2006–07
2007–2008. Southern University System Faculty Grantsmanship Excellence Award

Collaborators
Brookhaven National Laboratory: OEP, BNL-NSLS; Dowling College, Oakdale, NY; Louisiana Universities Marine Consortium (LUMCON); Tulane University LAMP

Synergistic Activities or Collaborations
Pine Barren Forest and Wetland
Environmental and Microbial research between SUNO, BNL, and Dowling College
**Abebe Kebede**  
Associate Professor  
Physics Department  
NC A&T State University  
Greensboro, NC 27411  
Total Years Teaching 20

**Education**  
Addis Ababa University  BS  
1982  Physics/Mathematics  
Temple University  MA  
1986  Physics  
Temple University  PhD  
1990  Physics

**Positions and Employment**  
1998–present  
Associate Professor, NC A&T State University  
Assistant Professor, NC A&T State University  
1990–1992  
Visiting Assistant Professor, Temple University

**Pedagogy and Research**

**Classes Taught (Both Lecture and Laboratory)**  
Modern Physics, Quantum Mechanics, Astrophysics, Astronomy, General Physics, Electromagnetism, Classical Mechanics, Solid State Physics, Statistical Physics

**New Courses Developed**  
Several Space Science Courses: Introduction to Space Science, Introduction to Space and Atmospheric Physics

**Research Interests**  
Physics of Materials and Space Science Education

**Existing Institution Research Laboratory or Research Center**

Name of Research Laboratory/Center: Physics of Materials Research  
General Description: Material synthesis and Characterization  
Number of Participants: Three students (variable)  
Funding Agency/Agencies: No funding  
Role: Principal Investigator

**BNL Experiences**

**2004**

Mentor: Myron Strongin  
Project Name: Electrical characterization of ultra-thin films of gold evaporated on amorphous germanium substrates

**Students Participating**: 2

**Research Mentoring (Summation)**

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
<th>Outcomes of Special Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Committee Member</td>
<td>5</td>
<td>Several MS and PhD students locally and at other institutions</td>
</tr>
<tr>
<td>Masters</td>
<td>Advisor</td>
<td>4</td>
<td>Two students went on to pursue the Ph.D. degree</td>
</tr>
<tr>
<td></td>
<td>Committee Member</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
Recent Grants
NIRT: Science and technology of self-assembled magnetic and superconducting nano-arrays. National Science Foundation. $1,400,000. 07/15/04–07/14/08.
Capacity Building Partnership for Research and Education in Space Science. NASA. $795,000. 01/01/04–2/15/08.
SCINDA2007 Workshop Addis Ababa Ethiopia, November 11–17. US Air Force. $45,000. 09/07–09/08

Recent Publications

Professional Enrichment

Professional Memberships
American Physics Society. (Life Member)
Ethiopian Physical Society (Founder and Member)
African Physical Society (Founder and Member)
African Scientific and Academic Network (Moderator)

Synergistic Activities or Collaborations
Reviewer of Physical Review Letters and Physical Review B (on going)
Proposal Reviewer, National Science Foundation (on going)
Proposal Reviewer, United States Civilian Research and Development Foundation (on going)
UNC System-wide Undergraduate Research Consortium liaison (on going).
American Physical Society Committee on Minorities in Physics: Minority Speakers List. (on going)
Developed the African Scientific Network (http://hoth.ncat.edu/~michael/asn)
Developed the African Biotechnology Forum (the only forum in the World) (http://hoth.ncat.edu/~michael/biotech)
Developed the African Journal of Physics
Physics in Africa and International Affairs: Session organizer at National Society of Black Physicists and National Conference of Black Physics Student Joint Conference, March 13–17, 2002 Alabama A&M University, Huntsville AL
Physics for Development, Africa Focus session chair, American Physical Society, March 2003 Meeting, Austin Texas
Physics for Development, Africa Focus session chair, American Physical Society, March 2009 Meeting, Pittsburgh, Pennsylvania
**Mark Kobrak**  
Associate Professor  
Chemistry Department  
Brooklyn College  
Brooklyn, NY  
Total Years Teaching 7

**Education**  
Northwestern University  
Evanston, IL, BA  
1992 Chemistry and Integrated Science  
University of Chicago, MA  
1994 Chemistry  
University of Chicago, PhD  
1997 Chemistry

**Positions and Employment**  
2006–present  
Associate Professor  
Brooklyn College, CUNY  
2001–2006  
Assistant Professor  
Brooklyn College, CUNY  
1999–2001  
Post-doctoral fellow  
Notre Dame University and Pennsylvania State University  
1998–1999  
Post-doctoral fellow  
University of Houston

**Pedagogy and Research**  
**Classes Taught (Both Lecture and Laboratory)**  
General (first-year) Chemistry, Physical Chemistry, Quantum Chemistry (PhD level)

**Research Interests**  
Physical chemical theory of quantum and classical processes in condensed phase. Current interest is in room-temperature ionic liquids.

**BNL Experiences**

<table>
<thead>
<tr>
<th>Year</th>
<th>Mentor</th>
<th>Project Name</th>
<th>Students Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>James Wishart</td>
<td>Physical Studies of Room-Temperature Ionic</td>
<td>2</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Mentor</th>
<th>Project Name</th>
<th>Students Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>James Wishart</td>
<td>Radiation Chemistry of Room-Temperature Ionic Liquids</td>
<td>2</td>
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</table>

**Research Mentoring (Summation)**

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>9</td>
</tr>
<tr>
<td>Masters</td>
<td>Committee Member</td>
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<tr>
<td>Doctorate</td>
<td>Advisor</td>
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<tr>
<td></td>
<td>Committee Member</td>
<td>1</td>
</tr>
<tr>
<td>Post-Doctorate</td>
<td>Advisor</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Committee Member</td>
<td>1</td>
</tr>
</tbody>
</table>
Mark Kobrak

Recent Grants
Submitted Kobrat, Mark. A simulation study of charge transport in dye-sensitized solar cells. NSF. $461,000. Resubmission is in preparation.


Recent Publications


Professional Enrichment
Institution/Departmental Committee Memberships
Deputy Chair, Chemistry, Brooklyn College
Deputy Executive Officer, Graduate Center
Undergraduate Advisor, Chemistry
Curriculum Committee
Safety Committee
Outcomes Assessment Committee
Green Chemistry Committee

Professional Memberships
American Chemical Society
Electrochemical Society

Collaborators
James Wishart, BNL
Sharon Lall-Ramnarine, Queensborough CC
Edward Castner, Rutgers University
Mark Maroncelli, Penn State Univ.
Sharon Lall-Ramnarine
Assistant Professor, Chemistry
Queensborough Community College, CUNY
Bayside, NY
Total Years Teaching 7

Education
University of Guyana
BS Chemistry
1995  Chemistry (major)
Biology (minor)
Queens College, CUNY
MA Chemistry
1998  Chemistry
The Graduate Center, City University of NY, M. Phil
2003  Chemistry
The Graduate Center, City University of NY, PhD
2003  Analytical Chemistry

Positions and Employment
2007 Research Collaborator / Mentor in the Faculty and Student Team (FaST) Program, Brookhaven National Lab

2004-Present
Assistant Professor of Chemistry, Queensborough Community College, CUNY

2003 - 2003
Adjunct Lecturer in Chemistry, Queens College, CUNY

2001 – Present
Research Collaborator / Guest in Chemistry, Brookhaven Nat. Lab

2001 - 2002
Graduate Assistant in Chemistry, Queens College, CUNY

1997 – 2001
Activity Coordinator for the NSF New York City Alliance for minority Participation (AMP) program
Queens College, CUNY

1996 - 1997
Graduate Assistant in Chemistry, Queens College, CUNY

Pedagogy and Research

Classes Taught (Both Lecture and Laboratory)
General Chemistry I and II lecture and laboratory (CH 151 and CH152)
Introductory College Chemistry lecture and laboratory (CH 127)
Introductory Organic Chemistry lecture and laboratory (CH 128)
Fundamentals of Chemistry lecture and laboratory (CH 120 and CH 121)
Chemistry and the Environment lecture (CH 110)
Chemistry and the Environment laboratory (CH 111)
Living in a Chemical World lecture (CH 101)
Living in a Chemical World laboratory (CH 102)

New Courses Developed
Developed Chemistry and the Environment as writing intensive.

Research Interests
Ionic Liquids: Synthesis, properties and applications; Green/sustainable chemistry

Existing Institution Research Laboratory or Research Center

<table>
<thead>
<tr>
<th>Name of Research Laboratory/Center</th>
<th>General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Faculty Research Laboratory</td>
<td>400 square feet of research space equipped with standard facilities including 3 fume hoods, rotary evaporators, hotplates, balances; High Vacuum Oven; High Vacuum pumps; UV-visible spectrometer; 60 MHz NMR; FT-IR; HPLC; GC-MS; Karl Fischer Titrator</td>
</tr>
</tbody>
</table>

Number of Participants 8-10 faculty members and 12-14 students
Role Mentor to 2-4 students per semester on individual research projects

BNL Experiences

<table>
<thead>
<tr>
<th>Year</th>
<th>Mentor</th>
<th>Project Name</th>
<th>Students Participating</th>
</tr>
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<tbody>
<tr>
<td>2005</td>
<td>James Wishart</td>
<td>Investigating the synthesis and physical characterization of ionic liquids</td>
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2006

<table>
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<th>Mentor</th>
<th>James Wishart</th>
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<td>Project Name</td>
<td>Ionic Liquids: Synthesis and characterization</td>
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<tr>
<td>Students Participating</td>
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2007

<table>
<thead>
<tr>
<th>Mentor</th>
<th>James Wishart</th>
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</thead>
<tbody>
<tr>
<td>Project Name</td>
<td>Ionic Liquids: Synthesis, characterization and application</td>
</tr>
<tr>
<td>Students Participating</td>
<td>2</td>
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Research Mentoring (Summation)

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
<th>Outcomes of Special Interest</th>
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<tbody>
<tr>
<td>Masters</td>
<td>Committee Member</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Doctorate</td>
<td>Committee Member</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Sharon Lall-Ramnarine

Recent Grants
Submitted
Lall-Ramnarine, Sharon, Co-PI. Energy Frontier Research Center (EFRC); DOE. $5,000,000 for 5 years. 10/1/08.
———, Co-PI. Science and Technology Center (STC). NSF. 10/15/08, Pre-proposal submitted.
———, PI. Integrated research strategies. NSF/LS–AMP. $3,000. 9/08 to 8/09.
———, PI. Designing and evaluating biodegradable ionic liquids. PSC CUNY. $3,700. 7/08 to 7/09.
———, Co-PI. Bioconversion of lignocellulose to ethanol and butanol facilitated by ionic liquid preprocessing. DOE. $1,676,850. 6/2008 to 10/2012.
———, PI. Dissecting the mechanism of ionic liquid antimicrobial activity: A structure/function and genetic analysis. QCC CUNY Collaboration. $30,000. 06/07 to 8/08.
———, PI. Applying microwave assisted organic synthetic techniques to the preparation of ionic liquid precursors and chiral carbanions. CUNY–EQUIPMENT, 50% matching funds from QCC Chemistry Department. $6,725. 11/06.
———, PI. Investigating the biological effects of common ionic liquids on Zebra Fish. PSC-CUNY. $3,940. 07/07–12/08.
———, PI. Investigating the biological effects of common ionic liquids; CUNY–Collaborative. $39,940. 04/06.
———, Liaison. STEP: The Queens Borough Bridge. NSF-DUE. $2,000,000. 09/2007–2012.
———, PI. Ionic liquids derived from biorenewable precursors: Synthesis and investigations of chiral and achiral materials; CUNY–Collaborative. $79,075. 03/05.
———, Co-PI. Research experience for undergraduates site: Multidisciplinary undergraduate research experience on ionic liquids. NSF–EMSI $241,767. 04/09/05–08/06.
———, PI. Syntheses of new ionic liquids. PSC–CUNY. $8,000. 03/04.
Awarded
———, PI. Designing and evaluating biodegradable ionic liquids. PSC CUNY. $3,700. 7/08–7/09.
———, Co-PI. Bioconversion of lignocellulose to ethanol and butanol facilitated by ionic liquid preprocessing. DOE. $1,676,850. 6/2008–10/2012.
———, PI. Dissecting the mechanism of ionic liquid antimicrobial activity: A structure/function and genetic analysis. QCC and CUNY Collaboration. $30,000. 06/07–8/08.
———, PI. Investigating the biological effects of common ionic liquids on zebra fish. PSC-CUNY. $3,940. 07/07–12/08.

Professional Enrichment
Institution/Departmental Committee Memberships
08/07-Present, College Admissions Committee
09/07-Present, Department Personnel and Budget (P&B) committee
08/06 – 07/07 College Designee of the Academic Senate Steering Committee on the Committee on Course and Standing
09/06 – 05/08 Organizing Committee of the 2008 Middle Atlantic Regional Meeting (MAR-M) of the American Chemical Society (ACS) as Co-chair of the Ionic Liquid Symposium
09/06 – 05/08 QCC Organizing Committee for the NY ACS 2008 Undergraduate Research Symposium, as symposium Co-chair
Spring 2005, Fall 2006, Spring 2008 Chemistry department search committee for new tenure track faculty members
09/05 – 08/06 College Designee of the Academic Senate Steering Committee to the Committee on Bylaws
9/04 – Present Chemistry Department’s Grade Grievance Committee

Professional Memberships
Member of the American Chemical Society
Member of Sigma Xi scientific research society

Honors and Awards
2007–2008. Director at Large for the NY section of the American Chemical Society
2006. Faculty Mentor award QCC Louis Stokes Alliance for Minority participation (LS–AMP) Program
2005–present. Co-Chair of the Student Affiliate Committee of the NY section American Chemical Society Annual Undergraduate Research Symposium.
2004–present. Assistant Director for the New York Regional Alliance for Ionic Liquids (NYRAILS)

2007–2008. Director at Large for the NY section of the American Chemical Society
2006. Faculty Mentor award QCC Louis Stokes Alliance for Minority participation (LS–AMP) Program
2005–present. Co-Chair of the Student Affiliate Committee of the NY section American Chemical Society Annual Undergraduate Research Symposium.
2004–present. Assistant Director for the New York Regional Alliance for Ionic Liquids (NYRAILS)
Sharon Lall-Ramnarine

Recent Publications


Collaborators

Collaborators within the last 48 months:

Prof. Edward Castner (Rutgers University), Prof. Robert Engel (Graduate Advisor, Queens College, City University of NY), Prof. Steven Greenbaum (Hunter College, City University of NY), Dr. A. J. Francis (Brookhaven National Laboratory), Prof. Mark Kobrak (Brooklyn College, City University of NY), Prof. Pokay Ma (Queens College, City University of NY), Prof. Catherine McIntee (Kingsborough Community College, City University of NY), Dr. Marie Thomas (Brookhaven National Laboratory), Dr. James Wishart (Brookhaven National Laboratory)

Synergistic Activities or Collaborations

2005–present. Co-Chair of the Student Affiliate Committee of the NY section American Chemical Society Annual Undergraduate Research Symposium.

2007–present. Director at Large for the NY section of the American Chemical Society.


2004–2007. Co-organizer of NYRAILS ionic liquid workshops at Brookhaven National Laboratory (April 2004); at Queens College (July 2007) and at Rutgers University, New Brunswick (October 2007)

2008. Co-organizer of ionic liquid sessions at the 40th Middle Atlantic Regional Meeting (MARM) of the ACS.

2007. Invited panel reviewer for the National Science Foundation’s (NSF) Course, Curriculum, and Laboratory Improvement (CCLI) Program.

2007. Reviewer for the National Science Foundation’s (NSF) Research in Undergraduate Institutions (RUI) program.
### Professor Profiles

**Varattur D. Reddy**  
Associate Professor  
Department of Physical Sciences  
Kingsborough Community College  
Brooklyn, NY  
Total Years Teaching 7

**Education**  
S.V. University, India, BS  
1974–1977 Chemistry, Physics, and Mathematics  
S.V. University, India, MS  
1977–1979 Chemistry/Organic  
Indian Institute of Technology, Bombay, India, PhD  
1986–1990, Organic/Organometallic

**Positions and Employment**  
2008–present  
Associate Professor  
Kingsborough Community College  
2001–2008  
Assistant Professor  
Kingsborough Community College  
2000–2001  
Research Associate and Adjunct Assistant Professor, St. Johns University  
1999–2000  
Visiting Assistant Professor  
Montclair State University, N.J.  
1998–1999  
Senior Scientist, Schering-Plough Research Institute, Kenilworth, NJ  
1996–1998  
Research Associate  
York College, CUNY  
1994–1996  
Research Associate  
Hunter College, CUNY  
1993–1994  
Research Scientist  
American Health Foundation  
Valhalla, NY  
1991–1993  
Research Associate  
Hunter College of CUNY  
1990–1991  
Post-doctoral Fellow  
Queens College of CUNY

### Pedagogy and Research

**Classes Taught (Both Lecture and Laboratory)**  
Organic Chemistry 1 and 2 Lecture and Labs

**New Courses Developed**  
Wrote two lab books and introduced new lab experiments. Introduced new teaching methods.

**Research Interests**  
Synthesis of Organic and organometallic compounds to study anticancer activity. Reduction of carbon dioxide to methanol using organometallic compounds as catalysts.

### Existing Institution Research Laboratory or Research Center

<table>
<thead>
<tr>
<th>Name of Research Laboratory/Center</th>
<th>General Description</th>
<th>Number of Participants</th>
<th>Funding Agency/Agencies</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Research Laboratory M158</td>
<td>Synthesis of novel Organic and organometallic compounds</td>
<td>3</td>
<td>PSC–CUNY Research Awards</td>
<td>Principal Investigator</td>
</tr>
</tbody>
</table>

### BNL Experiences

<table>
<thead>
<tr>
<th>Year</th>
<th>Mentor</th>
<th>Project Name</th>
<th>Students Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>D. C. Grills and D. Polansky</td>
<td>Towards Catalytic Carbon Dioxide Reduction: Photoinduced Hydrogen Atom Transfer From Novel Ruthenium Carbonyl Clusters</td>
<td>2</td>
</tr>
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### Research Mentoring (Summation)

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>7</td>
</tr>
</tbody>
</table>
Varattur D. Reddy

Recent Grants

Reddy, V. D., PI. Reactivity of ruthenium carbonyl clusters containing chiral carbohydrate ligands. PSC–CUNY–38. 7/1/07–6/30/08.

———, PI. Synthesis and catalytic activity of chiral ruthenium hydride clusters. PSC–CUNY–37. 7/1/06–6/30/07.

———, PI. Synthesis of ruthenium carbonyl clusters containing chiral carbohydrate ligands. PSC-CUNY-36. 7/1/04–6/30/05.

———, PI. Synthesis of modified nucleoside analogues as anti-HIV agents. PSC-CUNY-34. 7/1/03–6/30/04.


Recent Publications


Professional Enrichment

Institution/Departmental Committee Memberships

Deputy Chair, Chemistry, Brooklyn College
Deputy Executive Officer, Graduate Center
Undergraduate Advisor, Chemistry
Curriculum Committee
Safety Committee
Outcomes Assessment Committee
Green Chemistry Committee

Professional Memberships

American Chemical Society
Electrochemical Society

Collaborators

James Wishart, BNL
Sharon Lall-Ramnarine, Queensborough CC
Edward Castner, Rutgers University
Mark Maroncelli, Penn State Univ.
Elhag H. Shaban
Associate Professor
Electrical Engineering Department
Southern University
Baton Rouge, LA
Total Years Teaching 17

Education
University of Khartoum  BSEE
1968 Electrical Engineering
University of Khartoum  MSEE
1978 Electrical Engineering
University of Florida  PhD EE
1986 Electrical Engineering

Positions and Employment
1991–present
Associate professor
Southern University Baton Rouge
1988–1991
Consultant
Godak International
1987–1988
Visiting professor
University of Puerto Rico
1980–1986
Graduate student
University of Florida
1973–1979
National Council for Research
Khartoum, Sudan
1968–1972
Sudan Armed Forces
Khartoum, Sudan

Pedagogy and Research
Classes Taught (Both Lecture and Laboratory)
Electronics (Lec & Lab), Device Physics, Circuit Analysis (Lec & Lab), digital logic, layout and fabrication of integrated circuits

New Courses Developed
HBCU consortium–BNL: Introduction to Synchrotron Science Course

Research Interests
Fluorescence Gas detectors using Gas Electron Multiplier

Existing Institution Research Laboratory or Research Center
Name of Research Laboratory/Center
Micostructure Fluorescence Gas Detectors
General Description
Gas detector Laboratory
Number of Participants
2
Funding Agency/Agencies
LA Board of Regents
Role
Principal Investigator

BNL Experiences
2006
Mentor
D. P. Siddons
Project Name
Fluorescence Detector
Students Participating
2

2007
Mentor
D. P. Siddons
Project Name
Fluorescence Detector
Students Participating
2

Research Mentoring (Summation)
<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>2</td>
</tr>
</tbody>
</table>
Elhag H. Shaban

Recent Grants
Submitted Shaban, Elhag H., PI. Louisiana Board of Regent. $100,000. 2007.
Awarded Shaban, Elhag H., PI. EPSCoR. Louisiana Board of Regents. $12,000.

Recent Publications

Professional Enrichment
Institution/Departmental Committee Memberships
EE Department Council
Professional Memberships
ASEE
Collaborator
Dr. D. P. Siddons, BNL
Synergistic Activities or Collaborations
HBCU–NSLS–BNL consortium
**Swaminathan Subramaniam**  
Professor  
Chemistry Department  
Division of Natural Sciences and Mathematics  
Miles College  
Fairfield AL  
Total Years Teaching 13

**Education**  
B.I.T.S. Pilani, India  BS and MS  
1877 Chemistry  
Mississippi State University  
MS State, Mississippi PhD  
1989 Analytical Chemistry

**Positions and Employment**  
1997–present  
Professor, Associate Professor  
Assistant Professor, Miles College, Fairfield, AL  
1996–2002  
Visiting Faculty  
Part-time faculty  
Lawson State Community College, Birmingham, AL  
1989  
Jacksonville State University  
Dept. of Chemistry, Jacksonville, AL  
1977–1982  
Senior Chemist  
Sarabhai Research Center  
New Drugs Research Division, Vadodara, India  
1989  
Jacksonville State University  
Dept. of Chemistry, Jacksonville, AL  
1990–1994  
ENSOTECH, Sun Valley, CA, Quality Control Supervisor of Analytical Laboratories

**Pedagogy and Research**

**Classes Taught (Both Lecture and Laboratory)**  
Organic Chemistry I, II, General Chemistry I, II, Analytical Chemistry, Quantitative Analysis, Environmental Analysis, and Biochemistry

**New Courses Developed**  
Advanced Instrumentation Analysis

**Research Interests**  
Environmental analysis of Pharmaceuticals and priority pollutants in treated water, Nanotechnology using single walled and multi walled carbon nanotubes, Pharmaceuticals in domestic waste effluents by GC/MS and HPLC. Nucleotide synthesis using synthetic organic chemistry techniques.

**Existing Institution Research Laboratory or Research Center**

<table>
<thead>
<tr>
<th>Name of Research Laboratory/Center</th>
<th>Advanced instrumentation lab in the division of Natural Sciences and Mathematics, Miles College, Fairfield, Alabama</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Description</td>
<td>HBCU–UP funded research</td>
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<tr>
<td>Number of Participants</td>
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<tr>
<td>Funding Agency/Agencies</td>
<td>NSF</td>
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<tr>
<td>Role</td>
<td>Research Director</td>
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**BNL Experiences**

**2005**

<table>
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<tr>
<th>Mentor</th>
<th>Dr. Terry Sullivan</th>
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<tbody>
<tr>
<td>Project Name</td>
<td>Profiling of mercury near a coal burning power plant in Texas</td>
</tr>
<tr>
<td>Students Participating</td>
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</tbody>
</table>

**Recent Grants**

Subramaniam, Swaminathan, PI. DOD instrumentation award. $169,000.

———, PI. EPA award. $55,000.

———, PI. RSEC visiting faculty research awards (two different institutions). $50,000.

**Recent Publications**


Swaminathan Subramaniam

Professional Enrichment

Institution/Departmental Committee Memberships
Proposal committee, teacher education committee, Research director for HBCU–UP program

Professional Memberships
ACS, Alabama Academy of Sciences, Cahaba River Society

Collaborators
University of Alabama at Birmingham and Tuscaloosa, University of Minnesota, University of Tennessee

Synergistic Activities or Collaborations
2008. Worked as a Co-PI and Subcontractor for EPA grant EP-C-07-014 on Identification and Treatment of Emerging Contaminants in Wet Weather Flows, in collaboration with the Environmental Institute, Department of Civil, Construction, and Environmental Engineering, The University of Alabama, Tuscaloosa, AL. PI: Dr. Robert Pitt, Professor, The University of Alabama, Tuscaloosa, AL.
2007. Recipient of Department of Defense Research grant to purchase FT–NMR equipment in the Division of Natural Sciences and Mathematics at Miles College. Grant amount $ 169,000.
2007. Participated in the NSF sponsored CWCS workshop on Material and Nanotechnology for Chemists, conducted by the department of chemistry at Beloit College, Beloit, Wis. Advanced training in the nanotechnology and material science laboratory for undergraduate curriculum.
2006. Recipient of University of Minnesota–RSEC research fellowship in the department of chemistry. Research work was carried out on the analysis of pharmaceuticals in wastewater effluents using SPE/GC/MS and monitored the effect of chlorination on specific pharmaceuticals. Research Mentor: Dr. Kris McNeil.
2005. Participated in FaST (Faculty and Student Team) research at the Brookhaven National Laboratory, Upton, NY. Research work was carried out in the Environmental Technology Division with Dr. Terry Sullivan, on mercury profiling near a coal burning utility plant at Monticello, Texas.
2003 and 2004. Recipient of UT–RSEC research fellowship (An NSF sponsored program at the Department of Chemistry, University of Tennessee, Knoxville, TN). Research work was done at the Oak Ridge National Laboratory, Organic and Biological Mass Spectrometry department. Carried out research on separation and quantification of PAHs and porphyrins by HPLC/APPI/MS and HPLC/APCI/MS.
2003–present. Chemistry faculty coordinator for the Health Careers Opportunity Program (HCOP), at Miles College. Conducted chemistry workshops and relevant laboratories for both college and high school students during summer.
Research on "Cahaba River" of Birmingham for pollutants using standard analytical methods.
1999–present. Faculty advisor for Science Club at Miles College and Science News Letter publication
2002. Oak Ridge Institute of Science Education, (ORISE), Oak Ridge National Laboratory (ORNL); summer research at High Flux Isotope Reactor (HFIR). Research on neutron scattering studies on clathrate hydrates, and vibrational analysis of clathrate hydrates.
2001. Research training award in Materials Science and Engineering, Summer program, Department of Materials Engineering, University of Alabama, Tuscaloosa, Alabama
1999–2004. Miles College: Summer Science Faculty Grant, HBCU–UP program-support for summer research students and faculty stipend.
**Hazem Tawfik**  
Distinguished Professor and Director  
Mechanical Engineering Technology Department, Institute for Research and Technology Transfer (IRTT), School of Engineering Technologies  
State University of New York College of Technology at Farmingdale  
Farmingdale, NY  
Total Years Teaching 25

### Education
Alexandria University  BS  
1968 Mechanical Engineering  
Alexandria University  MS  
1974 Mechanical Engineering  
University of Waterloo  PhD  
1980 Mechanical Engineering  
University of Waterloo  Post Doctor  
1980 Chemical Engineering

### Positions and Employment
1996–present  
Distinguished Professor and Director of the Institute for Research and Technology Transfer (IRTT), SUNY Farmingdale.  
1990–1996  
Professor of Mech. Eng. Tech. Department, SUNY Farmingdale.  
1986–1990  
1983–1986  
Associate Professor of Mech. Eng. Tech., SUNY Farmingdale.  
1982–1983  
Atomic Energy of Canada, Mississaga, Ontario, Canada  
1980–1982  
Research Scientist, Ontario Hydro Research, Toronto, Canada

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### Pedagogy and Research

#### Classes Taught (Both Lecture and Laboratory)
- Robotics and Automation, CAD/CAM/CAE, Statistical Quality Control, Thermal Sciences

#### New Courses Developed
- Hydrogen Fuel Cells, Hydrogen Electrolyzers, Bio-fuels

#### Research Interests
- Bipolar plates development for Hydrogen and Methanol fuel cells

#### Existing Institution Research Laboratory or Research Center

<table>
<thead>
<tr>
<th>Name of Research Laboratory/Center</th>
<th>General Description</th>
<th>Number of Participants</th>
<th>Funding Agency/Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institute for Research and Technology Transfer (IRTT)</td>
<td>Its main mission is to support the regional economic growth through the development and transfer of new technologies to industry and enriches the educational experience of students.</td>
<td>10 Faculty, Visiting Professors, Engineers and Technologists, 12 undergraduate and graduate students</td>
<td>Farmingdale Foundation, Advanced Energy Research and Technology Center (AERTC), SBU–Empire State Development</td>
</tr>
</tbody>
</table>

#### BNL Experiences

<table>
<thead>
<tr>
<th>Year</th>
<th>Mentor</th>
<th>Project Name</th>
<th>Students Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Dr. Devinder Mahajan</td>
<td>Thermal and Humidity Management in Hydrogen and Methanol Fuel Cells</td>
<td>2</td>
</tr>
<tr>
<td>2007</td>
<td>Dr. Devinder Mahajan</td>
<td>Investigation of the effects of flow patterns, temperature and humidity inside the fuel cell</td>
<td>2</td>
</tr>
<tr>
<td>2008</td>
<td>Dr. Devinder Mahajan</td>
<td>Investigation of nonprecious catalyst, heat generation and humidity requirement for hydrogen and methanol fuel cells</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Research Mentoring (Summation)

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>60</td>
<td>Bachelor Engineering Technology Degree Senior Students</td>
</tr>
<tr>
<td>Masters</td>
<td>Advisor</td>
<td>2</td>
<td>Engineering Master Degree Project</td>
</tr>
<tr>
<td>Doctorate</td>
<td>Advisor</td>
<td>1</td>
<td>Bipolar Plates Research and Development for Hydrogen and Methanol Fuel Cells</td>
</tr>
<tr>
<td></td>
<td>Committee Member</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Post-Doctorate</td>
<td>Advisor</td>
<td>2</td>
<td>Bipolar Plates Research and Development for Hydrogen and Methanol Fuel Cells</td>
</tr>
</tbody>
</table>
Recent Grants

Submitted Tawfik, Hazem, PI. Advanced Energy Research and Technology Center. Stony Brook University. $25,000. Awarded.

———, PI, and Ralph James, Associate Laboratory Director. BNL Research Project. $15,000.

———, PI. Empire State Development. $150,000. Awarded.

———, PI. Environmental Protection Agency. $180,000. 2006. No award.

———, PI. Environmental Protection Agency. $1,500,000 Pending.

———, PI. Farmingdale Foundation. $30,000. Awarded.


———, PI. New York State Energy Research Development Agency. $200,000.

———, PI. Route 110 Redevelopment Incorporation. $85,000. Completed.


———, PI. Department of Energy. The development of two PEM Fuel Cells (30 kW each) for Farmingdale’s campus peak load shaving utilizing the hydrogen by-product of the 300 kW Molten Carbonate fuel cell manufactured by Fuel Cell Energy Inc. $6,000,000. Pending.

Awarded ———, PI. Advanced Energy Research and Technology Center. Stony Brook University. $25,000.

———, PI, and Ralph James, Associate Laboratory Director. BNL Research Project. $15,000.

———, PI. Empire State Development. $150,000

———, PI. Farmingdale Foundation. $30,000.

Tawfik, Hazem, PI. Route 110 Redevelopment Incorporation. $85,000.

Professional Enrichment

Institution/Departmental Committee Memberships

Institution/Departmental Committee Memberships

Chair of the Continued Appointment Committee in the Mechanical Engineering Technology Department, Farmingdale State College

Adjunct Professor in the Materials Science and Engineering Department, Stony Brook University

Applied Research Committee Member, Advanced Energy Research and Technology Center (AERTC), Stony Brook University

Honors and Awards

ASME Education Award

SUNY Research Foundation, Research Award

University of Waterloo Graduate Students Award

Professional Memberships

American Society of Mechanical Engineers (ASME)

American Society of Quality Control (ASQC)

Society of Manufacturing Engineers (SME)

Professional Engineer (P.E.) of the State of New York

Professional Engineer (P. Eng.) of the Province of Ontario, Canada

Certified Manufacturing Engineer (C.Mfg.E.)

Collaborators

Devinder Mahajan (Biofuels, Brookhaven National Laboratory & Stony Brook University), Yoguslav Adzic (Catalyst, Chemistry, Brookhaven National Laboratory),

Fred Janckle (Senior Manager, Fuel Cell Energy Inc.)

Synergistic Activities or Collaborations

Hydrogen and Methanol Fuel Cell and Hydrogen Generator Research and Development
Recent Publications


Jiufeng Tu
Associate Professor
Physics Department
The City College of New York
New York, NY
Total Years Teaching 5

Education
Harvard University, MA BA, MA
1993 Physics
Cornell University, NY MS
1995 Physics
Cornell University, NY PhD
2000 Physics

Positions and Employment
2008–present
Associate Professor
The City College of New York
2003–2007
Assistant Professor
The City College of New York
2000–2003
Research Associate
Brookhaven National Laboratory

Pedagogy and Research
Classes Taught (Both Lecture and Laboratory)
PHYS 353 & 354 (Electromagnetism), PHY S207 & 208 (Introduction Physics)

Research Interests
Optical Spectroscopy

Existing Institution Research Laboratory or Research Center

<table>
<thead>
<tr>
<th>Name of Research Laboratory/Center</th>
<th>CREST</th>
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</thead>
<tbody>
<tr>
<td>General Description</td>
<td>CREST: CENTER FOR EXPLOITATION OF NANOSTRUCTURES IN SENSORS AND ENERGY SYSTEMS (CENSES)</td>
</tr>
<tr>
<td>Number of Participants</td>
<td>~ 20 faculty</td>
</tr>
<tr>
<td>Funding Agency/Agencies</td>
<td>NSF</td>
</tr>
<tr>
<td>Role</td>
<td>Project leader</td>
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</table>

BNL Experiences

2006

<table>
<thead>
<tr>
<th>Mentor</th>
<th>Myron Strongin</th>
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</thead>
<tbody>
<tr>
<td>Project Name</td>
<td>Nucleation properties of materials deposited onto carbon nanotubes at low temperatures</td>
</tr>
<tr>
<td>Students Participating</td>
<td>2</td>
</tr>
</tbody>
</table>

Research Mentoring (Summation)

<table>
<thead>
<tr>
<th>Level</th>
<th>Role</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>4</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>Advisor</td>
<td>3</td>
</tr>
<tr>
<td>Doctorate</td>
<td>Committee Member</td>
<td>8</td>
</tr>
</tbody>
</table>
Recent Grants

Tu, Jiufeng J., PI. Crystal growth and spectroscopic studies of low dimensional electron systems. DOE/BNL. $168,889. 02/01/2007–02/01/2012.


———, PI, and M. C. Tamargo, co-PI. Infrared studies of CdMgTe as the material of choice for room temperature gamma-ray detectors. NSF/DNDO. $401,821, 09/01/2007–08/31/2010.

Recent Publications


Professional Enrichment

Professional Memberships
American Physical Society

Collaborators
Philips B. Allen (Stony Brook University), Jules P. Carbotte (McMaster), G. Larry Carr (NSLS, BNL), Genda Gu (BNL), Christopher C. Homes (BNL), Peter D. Johnson (BNL), Laszlo Mihaly (Stony Brook University), Myriam P. Sarachik (City College), Thomas Timusk (McMaster), and X.X. Xi (Penn State).
Ju Xin
Associate Professor of Physics
Physics & Engineering Technology Department
Bloomsburg University of Pennsylvania
Bloomsburg, PA
Total Years Teaching 14

**Education**
- Shanxi University BS 1982 Laser Physics
- Marquette University MS 2001 Computer Science
- Stockholm University PhD 1995 Physics

**Positions and Employment**
- 2005–present
  - Associate Professor
  - Bloomsburg University
- 2001–2005
  - Assistant Professor
  - Bloomsburg University
- 1999–2001
  - Research Associate
  - Marquette University
- 1997–1999
  - Staff Scientist
  - University of Arizona
- 1995–1996
  - Post-doc Research Associate
  - Arizona State University
- 1990–1995
  - PhD candidate & T.A.
  - Stockholm University

**Pedagogy and Research**

**Classes Taught (Both Lecture and Laboratory)**

**New Courses Developed**
- Science of Light and Color

**Research Interests**
- Laser spectroscopy of transient species of astronomical, atmospheric, and combustion importance

**BNL Experiences**
- 2008
  - **Mentor**: Trevor Sears
  - **Project Name**: Frequency modulated laser absorption spectroscopy of singlet CH2 in the near infrared region
  - **Students Participating**: 2

**Recent Publications**


**Professional Enrichment**

**Professional Memberships**
- American Physical Society, Association of American Physics Teachers

**Collaborators**
- Trevor Sears, BNL, Scott Reid, Marquette University
**Lori Zaikowski**  
Professor of Chemistry, Chemistry/Physics  
Department Chair  
Chemistry and Physics  
Department  
Dowling College  
Oakdale NY  
Total Years Teaching 18

**Education**  
Stony Brook University BS  
1986 Biological Sciences  
Stony Brook University MS  
1991 Chemistry  
Stony Brook University PhD  
1996 Chemistry

**Positions and Employment**  
1992–present  
Instructor through Full Professor  
Dowling College  
1987–1991  
Grades 5–12 Science/Math Teacher, schools in Sachem S.D., Copiague, and Guatemala

**Pedagogy and Research**

**Classes Taught (Both Lecture and Laboratory)**  

**New Courses Developed**  

**Research Interests**

1. Electron Transfer Research at BNL: The two major areas are "Energetics of Electron Transfer" and "Molecular Wires"  
2. Chemistry in Action Research Program

**Existing Institution Research Laboratory or Research Center**

<table>
<thead>
<tr>
<th>Name of Research Laboratory/Center</th>
<th>Chemistry Research Laboratory</th>
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</thead>
<tbody>
<tr>
<td>General Description</td>
<td>Undergraduate research lab</td>
</tr>
<tr>
<td>Number of Participants</td>
<td>None yet; installation to begin in January 2009. Expected completion date of August 2009.</td>
</tr>
</tbody>
</table>

**BNL Experiences**

<table>
<thead>
<tr>
<th>Year</th>
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<th>Project Name</th>
<th>Students Participating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>John R. Miller</td>
<td>Energetics of Charge Separation</td>
<td>5</td>
</tr>
<tr>
<td>2007</td>
<td>John R. Miller</td>
<td>Electron Transfer in Oligofluorene Molecular Wires</td>
<td>3</td>
</tr>
<tr>
<td>2008</td>
<td>John R. Miller</td>
<td>Titrations of Reduced Oligofluorenes with strong electron acceptors</td>
<td>1</td>
</tr>
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**Research Mentoring (Summation)**

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<td>~30</td>
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</table>

Numerous presentations at national and local meetings and to governmental entities, peer-reviewed publications.
Submitted I don’t keep track of the ones that were not funded. I was PI on two submissions (and Co-PI on a third submission) to NSF a few years ago to establish an Undergraduate Research Center. The requested funding was about $2.7 million. There have been several others to private corporations (Honda, Toyota, etc.) and governmental entities (two requests for earmarks), mostly revolving around enhancing integration of research and teaching and acquiring instrumentation. I am PI on a pending grant proposal to NSF for Phase II of the Robert Noyce Program at Dowling ($500,000 over 4 years).

Awarded

Miller, J. PI, and L. Zaikowski (Faculty Advisor). Department of Energy funding for Dowling Noyce Scholar Juan Alicea in SULI Internship program at Brookhaven National Laboratory and Co-op Internship Program through Dowling College. $7,000. Fall 2005.

Zaikowski, L. (Primary Coordinator and Mentor), S. R. Seidel (Co-coordinator), and P. Lichtman (Mentor). American Chemical Society Project SEED. Dowling College approved as an ACS Project SEED Institution effective April 2007. $5,000. 2007.

———, PI. Idle Hour Flyfisher’s Association Fellowship. Secured annual donation to support one student per year on a Research Fellowship to work in the Chemistry in Action research program. $4,300. 1999–present.

———, et al. New AA and GC/MS instruments for teaching and research funded by Dowling College through science department budgets and LRPDC research and travel funds pooled over two years among science faculty. Coordinated pooling of funds and negotiated discounts from Varian. $125,000 MSRP; $105,000 actual cost to Dowling. 2001–2003.

———, PI. John Miller (BNL Chemistry Department, Thermal and Photoreactions Group), Juan Alicea and Kate Dorst (Dowling students), and Brian Albert, Steven Bohlman, and Alex Yang (HS students). NSF. $16,500. June 2006.

———, PI. John Miller (BNL Chemistry Department, Thermal and Photoreactions Group), Elicia Selvaggio (Dowling Noyce Scholar), Brian Albert (Columbia University student), and two HS students. Research on effects of polarity on charge separation in molecules and wires. NSF. $17,000. Summer 2007.


———, PI. NSF Supplemental funding for Dowling Noyce Scholars Juan Alicea and Paul Guzzardo to conduct research and develop educational modules in the Pre-Service Teacher Program and the SULI Program at Brookhaven National Laboratory. $9,000. Summer 2005.

———, PI. NSF Supplemental Funding for Dowling Noyce Scholar Paul Guzzardo to conduct research and develop educational modules in the Pre-Service Teacher Program at Brookhaven National Laboratory. NSF. $4,500. Summer 2004.

Recent Publications


Professional Enrichment

Institution/Departmental Committee Memberships

Current: Chair of the Chemistry and Physics Dept since 1995, Natural Sciences and Mathematics Faculty Development and Curriculum Committee since inception, Established/oversee Early College Program in Chemistry, Founder/Director of Chemistry in Action Research Program.

Honors and Awards

Elected to Board of Directors of American Chemical Society New York Section (2009 term)

Appointed to NSF Project Advisory Board (Chemistry representative) for development of NSF-funded website on “Understanding Science” at U.C. Berkeley. (2006–present)

Appointed Member of American Institute of Biological Sciences Education Committee (2004–present)

Research Hero Award for mentorship of minority research students at Uniondale H.S. (2004)


Professional Memberships

American Chemical Society, AAAS, NY Academy of Sciences, American Institute of Biological Sciences, National Science Teachers Association

Collaborators

John Miller (BNL), Jon Friedrich (Fordham Univ.), S.R. Seidel (Dowling College), Paul Lichtman (Uniondale H.S.)

Synergistic Activities or Collaborations


2008–present. Appointed Chair of the Governmental Affairs Committee, American Chemical Society New York Section.

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(631) 344-5832 fax

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DOE Internships: CCI and FaST

Educational Programs Administrator  
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Administrative Support  
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gurski@bnl.gov