



Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM)

2012 and 2013 Awardees

Bios reflect awardees at the time of nomination submission.



Dr. Luis A. Colón, Professor and Chair, Department of Chemistry, State University of New York at Buffalo

In 1991, Dr. Luis A. Colón completed his PhD. in the Department of Chemistry at the University of Massachusetts, Lowell. His research interests are in the field of micro/nano chemistry. Early in his career, Dr. Colón made contact with and traveled to the University of Puerto Rico-Cayey (UPR-Cayey) to recruit students for summer research in his laboratory, providing support with his own research funds. He then persuaded several of his colleagues to join him in recruiting for the program, and this has been important in creating continuity and validating the sense of commitment between the two institutions. The relationship continues today.

A total of 30 Hispanic undergraduate students from UPR-Cayey have come to the University at Buffalo, the State University of New York (SUNY Buffalo), for summer research experiences. Six of the students are completing their degrees at the home institution, and of the 24 who have earned the bachelor's degree, 17 (70%) have gone on to pursue advanced degrees or medical school. A number of these students have joined the graduate program at Buffalo, contributing to the success of recruiting Hispanic graduate students into the program.

For over a decade, Dr. Colón has personally mentored 25 undergraduate minority students—all having received their bachelor's degree. Nearly all undergraduates were mentored in Colón's research laboratory. He has mentored and/or directly supervised a total of 43 graduate students (36 already graduated – 11 masters, 25 doctorates), from groups traditionally underrepresented in STEM fields. His group has been very diverse through the years: His PhD graduates include 11 males and 14 females; the MA graduates include four males and seven females. His current group includes two males and four females. From both groups, 74% are women and/or members of underrepresented groups in chemistry.

Because of his leadership, recruiting efforts, ability to promote diversity, and unconditional support of different enabling programs at SUNY Buffalo, Colón is an essential contributor to university-wide activities and committees dedicated to increasing underrepresented groups in the fields of science. For example, he is an active member of the Advisory Committee to *The Arthur A. Schomburg Fellowship* Program which offers support for historically underrepresented students in graduate programs across the university. At SUNY Buffalo, he has worked as a mentor for both the Bridge to the Doctorate Program under the National Science Foundation's Louis Stokes Alliances for Minority Participation and Alliances for Graduate Education and the Professoriate programs.

In his one-on-one approach, Dr. Luis Colón guides his graduate students throughout their graduate career working together closely to ensure they write scientific manuscripts to publish their research work. In fact, students have been coauthors in all of Colón's peer-reviewed publications since he became an independent researcher.

Dr. Colón speaks and lectures around the country at numerous symposia and conferences. He is the 2012 Western New York recipient of the American Chemical Society's *Jacob F. Schoelkopf* award in recognition of outstanding research and mentoring—the oldest award of its kind in the nation—and he received the 2009 *American Association for the Advancement of Science Mentor Award*. The significance of his efforts has led to national recognition from *Excelencia in Education* of the University at Buffalo's chemistry department as one of America's top programs for increasing science degree completion among Latinos in higher education at the graduate level.

He holds eight U.S. patents and has more than 80 publications related to his research. His research work has led to over 380 presentations, including more than 175 invited lectures at national and international universities, conferences, and industrial and national laboratories.

Dr. Anne E. Donnelly, Director, Center for Undergraduate Research, University of Florida

Dr. Anne Donnelly earned her PhD in instruction and curriculum from the University of Florida (UF). Since 1996, Dr. Donnelly has been a mainstay for mentoring at the University of Florida through her leadership of the University's Center for Undergraduate Research, as well as her work in the Southeast Alliance for Graduate Education and the Professoriate (a National Science Foundation (NSF)-supported alliance known as SEAGEP).

Mentoring developed by Dr. Donnelly as part of the South East Alliance for Graduate Education and the Professoriate (SEAGEP) program has resulted in the placement of 18 PhDs in the private sector and 14 in government laboratories. Of perhaps greater significance are the 18 who are currently hold academic positions; these young researchers are in a position to act as role models to other younger students. The 54 PhDs and 17 MA degrees earned at the University of Florida by SEAGEP students reflect an 87% retention rate.

Over 500 undergraduate students, with 29% minority representation and 41% women, were provided with the opportunity to conduct research in a National Science Foundation Engineering Research Center as a result of her efforts. She continues to mentor undergraduate researchers at UF through the newly established Center for Undergraduate Research (CUR).

Dr. Donnelly's mentoring program is designed to maintain close and consistent contact with University of Florida students from groups underrepresented in STEM. The main elements of her program include:

- A one-stop location for tapping into resources across the campus to help students regardless of the obstacle encountered.
- Research experiences for all undergraduates.
- Coaching on degree persistence in the face of challenges. She believes that a focus on time-to-degree may not be a useful measure for women and minority students who often have significant family-related responsibilities outside of school. When life adds time to a degree program, she coaches the students to understand and finish.
- International experiences for graduate students and awareness of global issues. Donnelly ran four trips (averaging 14 days each) that took a total of 50 students to Brazil, Chile, China, and South Africa, providing them a research component and working visits to universities, industry, funding agencies, and field sites in those countries. Data indicates that a mentored approach (and a shorter-term trip) can be effective in developing multicultural skills.

Shortly after earning her PhD, Dr. Donnelly started her work to support diversity in STEM in her first position as the Education and Outreach Director for the NSF-funded Particle Engineering Research Center (PERC) at the University of Florida. In 1996, when she began her affiliation with PERC, minority students made up 11% of the undergraduate researchers, and there were approximately 20 students working in PERC labs. By 2004, Donnelly's recruitment efforts were successful: underrepresented minorities comprised 29% of the undergraduate research population, which grew to approximately 60 students working in PERC labs per semester. These students, representing over 11 STEM departments across 4 colleges, experienced the culture of interdisciplinary research. In 1998, only 9% of the PERC graduate student population came from underrepresented minorities; by 2002, this measure stood at 36%.

With NSF funds, she developed a Research Experiences for Undergraduates program in particle research in which 100 students (50% of whom were minorities and women) outside of the University of Florida, participated over a ten year period.

Additional notable accomplishments of Dr. Donnelly include:

- Development of an undergraduate level dual degree engineering program with an Historically Black Colleges and University (HBCU), the University of the Virgin Islands (UVI);
- Placement of over 200 undergraduate students in research-intensive activities across the campus;
- Leadership of the Florida Louis Stokes Alliance for Minority Participation; and
- Appointment to the President's Council on Diversity at the University of Florida.

Dr. Lorraine N. Fleming, Professor, Department of Civil & Environmental Engineering, College of Engineering, Architecture and Computer Sciences, Howard University

Dr. Lorraine Fleming's 27-year career as a scientist, department chair, and university mentor has been one of accomplishment, and her achievements are nowhere better illustrated than through her establishment of two signature programs:

- The Howard University Science, Engineering and Mathematics (HUSEM) Center for Education and Research that offers mentoring programs and conducts rigorous research in STEM education. Under her leadership, the center has attracted more than \$8 million of continuous funding from the National Science Foundation, Intel, Google, Semiconductor Research Corporation, and others.
- The Global Education, Awareness and Research Undergraduate Program (GEAR-UP) which prepares undergraduates for global scientific engagement and provides access to global research opportunities for her mentees.

The HUSEM mentoring experience begins prior to the freshman year with the summer precollege program, continues throughout the undergraduate years and, for some, into graduate school and career life. The emphasis is on creating a social and intellectual network, building students' confidence and skills in math and science, and training "peer mentors" as tutors and advisors.

During students' junior and senior years, the HUSEM program focuses the mentorship experience on research. To this end, students spend time conducting research within a faculty member's STEM research team and laboratory. To facilitate this process, Dr. Fleming identifies and trains, as needed, faculty colleagues to serve as research mentors.

The HUSEM program has mentored 186 science and engineering students in ten different majors. The 4-year graduation rate for HUSEM students is 46% and the five-year graduation rate is 71% for these students. Both rates far exceed the national four-and-five year graduation rates for African-Americans in STEM.

The objective of GEAR-UP is to provide Howard students with an academically rigorous international environment and interactions with a select group of STEM students from the best technical universities around the world, with close mentoring by Dr. Fleming. Dr. Fleming has established international partnerships with eight institutions, and is developing relationships with five other institutions to host Howard students.

GEAR-UP mentored students have fanned out across the globe to study a range of engineering and science topics, including human-computer interface in the Philippines, online denial-of-service attacks in Chile, transportation and flood control in Indonesia, wind power in rural Ethiopian villages, and water recycling in Kenya.

Dr. Fleming has mentored 36 African-American STEM students through her international program. This is a significant number given that African-American students are the group least likely to engage in international learning and research experiences.

In addition to this work, Dr. Fleming currently mentors 106 8th grade students from low and moderate income households in Montgomery County, Maryland. Her *Saturday STEM Academy* is an annual, five-week program where the students interact with Howard University undergraduates and local community college students.

The Howard University and community college students learn the value and benefit of giving back to the younger students—thus preparing them to be the next generation of mentors. This exposure to college students and an engineering professor who teaches them, gives the young students a first-hand look at the college experience and exposure to STEM career options.

Dr. Sheila M. Humphreys, Director of Diversity, College of Engineering, Department of Electrical Engineering and Computer Sciences, University of California at Berkeley

Dr. Sheila M. Humphreys is recognized as a Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring for her enduring programs to advance the education and careers of women and minorities who are underrepresented in engineering and computer science.

Dr. Humphreys' mentoring spans three decades. Her activities address critical issues in recruitment, retention and graduation of women and minorities in electrical engineering and computer sciences.

In 1982, after joining the Department of Electrical Engineering and Computer Sciences (EECS) at the University of California at Berkeley (UCB), Dr. Humphreys co-founded a ground-breaking program, the *Computer Science Reentry Program*, with two UCB alumnae. This program provides an alternative path to graduate school for talented post-baccalaureate reentry women and minorities. Of the students who participated, ten earned Ph.D. degrees and 39 earned M.S. degrees.

In 1985, Dr. Humphreys founded a graduate-level minority recruitment and retention program in EECS that is the root of UCB's success in graduating minority engineering Ph.D.s. She and the chair of EECS also established a collection of programs for both minority and non-minority students called *Excellence and Diversity Student Programs*.

Dr. Humphreys' program development at UCB includes the Virtual Development Center (funded by the Institute for Women and Technology) which focuses on the technological needs of disabled women. On a campus-wide level, she served with the *Berkeley Edge Program*, supported by the National Science Foundation's (NSF) *Alliance for Graduate Education and the Professoriate*, with the goal of tripling the number of minority doctorates in science and engineering.

Knowing that research opportunities are important features in successful mentoring, Dr. Humphreys organized the *Summer Under-graduate Program in Engineering Research (SUPERB)* in 1990, followed by a companion program for students in information technology. Seventy-six percent of the first cohort of *SUPERB* students reported that before the program they felt uncertain about their chances at graduate work; but after the *SUPERB* program they were certain that they would go on to graduate work. The "admit" rate of *SUPERB* students to Berkeley's graduate program in electrical engineering and computer science was three times that of non-*SUPERB* students. The *SUPERB* program has now been in existence in EECS at UCB for more than 20 years and has graduated 195 participants.

In 1999, Dr. Humphreys received the A. Nico Habermann Award from the Computing Research Association, "in recognition of outstanding contributions to the advancement of underrepresented groups in computing research." She is on the national leadership team for the NSF Empowering Leadership Alliance and an invited member of the Computing Research Association working group which produced the report "Recruitment and Retention of Underrepresented Minority Graduate Students in Computer Science" (August 2000). She is the UCB representative to the National Coalition for Women in Computing and is a member of the Berkeley Coalition for Excellence in Mathematics, Science and Engineering.

Dr. Raymond L. Johnson, Emeritus Professor of Mathematics, University of Maryland at College Park

Dr. Raymond L. Johnson is recognized as a Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring for his tireless and highly successful mentoring efforts with students from groups underrepresented in mathematics.

Dr. Raymond Johnson was the first African-American admitted to Rice University (1964) where he earned a doctorate in mathematics in 1969 (his dissertation was “*A Priori* Estimates and Unique Continuation Theorems for Second Order Parabolic Equations.”) Retiring after 40 years from the University of Maryland College Park (UMCP), Dr. Johnson has returned to Rice as a visiting professor.

He joined the UMCP faculty in 1980, becoming the first African-American to be promoted to Associate Professor and the first to serve as Chair of the Department of Mathematics. His research began with work on non-well posed problems which led him to the study of Besov spaces and harmonic analysis. His interest in harmonic analysis continues today.

At the University of Maryland, Dr. Johnson personally mentored numerous graduate students, with the largest number of students advised in the period between 1990-2009. During that time, 53 underrepresented minority students pursued their M.A. and/or Ph.D. degrees. All but one of these students was African-American, and 22 of the students were African-American women.

Many of his graduate students graduated from smaller, Historically Black Colleges and Universities. Dr. Johnson knew a successful mentoring plan must prepare these students for the challenges they would face in the transition to a majority institution the size of UMCP.

Substantive components of Dr. Johnson’s mentoring plan involved regular group meetings to develop a sense of community, as well as course selection and counseling. Keenly aware of the need to familiarize minority students with inter-disciplinary environments, Dr. Johnson encouraged his protégés to interact with minority graduate students across department lines.

Of Dr. Johnson’s 53 graduate students, 23 completed their Ph.Ds in mathematics. In 2000, history was made at UMCP when the first African-American woman earned a Ph.D. in mathematics; in fact, three African-American women graduated at the same time. Of the 23 Ph.D. recipients, 14 of them currently hold academic appointments at major U.S. institutions of higher education, and three of them are tenured professors.

Dr. Johnson’s honors and affiliations include:

- The AAAS Lifetime Mentor Award in 2007.
- Distinguished minority faculty award from the University of Maryland, 1986.
- Visiting Faculty Fellow, IBM Watson Research Center, 1977
- Research grant from the Swedish Institut Mittag-Leer, 1974-75.
- Graduate Research Fellowship, National Science Foundation

Dr. Murty S. Kambhampati, Professor of Biology, Southern University at New Orleans

Dr. Murty S. Kambhampati is recognized as a Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring for his success preparing underrepresented minority high school students for college and undergraduate students for graduate programs through intensive research mentoring (hands-on and minds-on experience) and scientific competition (presentations at research conferences).

After earning his doctoral degree in environmental sciences from Jackson State University, Dr. Kambhampati began his career at Southern University, a prominent Historically Black College and University (HBCU) in New Orleans. Knowing the importance of teaching and research for undergraduates at an HBCU, Dr. Kambhampati developed a mentoring formula that has produced remarkable results. He uses research opportunities for undergraduates in order to:

- Build student character and confidence in skill development;
- Create opportunity channels for career development and, most importantly;
- Utilize research as a teaching tool.

Dr. Kambhampati's mentoring methods are designed to expose students to research and the professional environment as early as possible. For students from disadvantaged backgrounds, traveling to state-of-the-art research facilities and conducting research enables them to appreciate science while providing opportunities to experience academic success, learn scientific research skills, and develop professional skills.

With the strength of his program, Southern University has received major resource support from the National Science Foundation, the National Institutes of Health, and the U.S. Department of Education, among others.

Over the past 12 years, Dr. Kambhampati has personally mentored 65 minority biology majors in addition to several high school students. All of the students mentored by Dr. Kambhampati in that period have graduated. Of 27 graduates tracked since 2002, 71% have gone on to graduate and professional schools.

These mentoring efforts have resulted in impressive student achievements, as well. Dr. Kambhampati's students have produced 60 research abstracts, more than 60 presentations at regional, national, and international conferences, nearly 20 student awards for excellence in poster and oral presentations, and several peer-reviewed publications as co-authors.

Dr. Kambhampati received Southern University's 2005 *Chancellor's Award for Excellence in Teaching, Research and Mentoring*. He currently serves as Biology Coordinator for the NSF Louis Stokes Alliance for Minority Participation project in Louisiana.

Two of Dr. Kambhampati's protégés have received the *National Student Role Model Award* from Minority Access, Inc. for excellence in academics and research. They were the first students in Southern University's history to receive this award.

Dr. John T. Matsui, Assistant Dean of Biology, College of Letters of Science, University of California, Berkeley

Dr. Matsui is the co-founder and director of the nationally renowned Biology Scholars Program (BSP) at the University of California, Berkeley. He has spent over two decades making science more accessible to all individuals. BSP is an undergraduate diversity program in Berkeley's Department of Integrative Biology. Funded by the Howard Hughes Medical Institute, the Gordon and Betty Moore Foundation, the California Wellness Foundation and, most recently, the National Institutes of Health, its goal has been to enlarge and diversify the pool of Berkeley students who succeed in biology majors and related careers.

There have been 2,080 BSP graduates over the past 20 years, and Dr. Matsui has personally mentored 1,183 of them. BSP students are diverse; 60% minority (African American, Hispanic, and American Indian) and 70% women. As well, 80% of BSP students come from low-income backgrounds and/or are the first in their family to attend college.

Dr. Matsui's mentoring model includes customary activities such as tutoring, advising, paid research, and community building. However, he and his staff go beyond the usual model by:

- Requiring his students to take ownership and responsibility for their activities and develop their own extra-curricular experiences;
- Assigning older students to mentor younger students about science, and university culture; and
- Creating customized plans to help them develop individualized plans for success.

Over the past 20 years, there has been notable success in Matsui's BSP program. For example:

- African-American and Hispanic students in Dr. Matsui's program graduated with a degree in the same percentage (60%) as Asian and white students. This rate is more than twice the graduation rate (24%) of minority students who did not participate in BSP.
- Between 2005 and 2010, 58% of the BSP students from disadvantaged backgrounds who earned biology degrees at Berkeley graduated with a 3.0 GPA or higher compared to 27% of non-BSP students from disadvantaged backgrounds.
- From 2004 to 2011, 85% of Dr. Matsui's students who applied to medical school were admitted as compared to a national admissions average of 50% and a UC Berkeley average of 55%.
- Between 2006 and 2009, 10% of all African-Americans enrolled in a California medical program came from Dr. Matsui's program.

John Matsui has expanding his influence across the Berkeley campus through his leadership as Chair of the Coalition for Excellence and Diversity in Mathematics, Science and Engineering. The coalition is developing a campus-wide effort involving five STEM fields (in four colleges) to recruit and retain low income, first generation, and underrepresented ethnic minority students. In addition, Dr. Matsui has disseminated his BSP model statewide and nationally, and has helped to establish similar mentoring programs at 11 colleges and universities in eight states, including three other University of California campuses.

Dr. Gary S. May, Dean, College of Engineering, Georgia Institute of Technology

Dr. Gary S. May is recognized as a Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring for his achievements in promoting the success of students from underrepresented groups in science and engineering through more than two decades of recruiting and mentoring at the Georgia Institute of Technology.

Since arriving at the Georgia Institute of Technology in 1991, Dr. May recognized that although Georgia Tech was graduating large numbers of African Americans, too few undergraduates participated in research or considered graduate school, and a very small number of those who received doctorates returned to academia. He set out to change that pattern.

In 1992 Dr. May initiated the *Summer Undergraduate Research in Engineering/Science (SURE)* program to provide underrepresented minority students with practical research experience and encourage them to pursue graduate education. The success of the program is evidenced by the fact that nearly 75% of past participants are either enrolled in graduate school, plan to attend graduate school within two years or have completed a graduate degree.

Key elements of the *SURE* program include:

- Ten weeks of challenging research projects
- Pairing each student with a faculty advisor and a graduate student mentor
- A weekly seminar on emerging research in STEM
- A stipend competitive with industrial internships
- Opportunities to visit industrial research sites

In 1998, Dr. May and colleagues received an *Alliances for Graduate Education and the Professoriate* grant from the National Science Foundation (NSF) for the *Facilitating Academic Careers in Engineering and Science (FACES)* program, a joint effort between the Georgia Institute of Technology, Emory University, Morehouse College, and Spelman College. Over the decade-long duration of the program, a total of 337 underrepresented students have received Ph.D. degrees in science or engineering, the greatest number in such fields in the nation.

On the national level, Dr. May has served for more than two decades on the governing board of the National Society of Black Engineers (NSBE), a non-profit organization dedicated to increasing the participation of African-Americans in engineering and the physical sciences.

During his tenure as NSBE National Chairperson (1987-89), he helped NSBE establish a permanent national headquarters, publish its first *Annual Report*, establish its Pre-College Initiative program, develop a Strategic Plan, and establish the NSBE Alumni Extension and Board of Corporate Affiliates. During his long association with the organization, Dr. May has mentored literally hundreds of NSBE members and leaders.

Dr. May has served on the NSF Committee on Equal Opportunities in Science and Engineering (which he chaired from 2000-2001) and the congressional Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology (CAWMSET, 2000). He received the American Association for the Advancement of Science's *Mentor Award* in 2007. More than 25 of his more than 200 research publications focus on the minority engineering educational effort.

**Dr. Beth A. Olivares, Associate Dean for Diversity Issues in Arts, Sciences, and Engineering,
University of Rochester**

Since 1994, Dr. Beth Olivares has developed three campus-wide mentoring programs at the University of Rochester—dedicating a major portion of her professional activities to the mentoring of undergraduate and graduate students. The results are impressive: Olivares has personally mentored over 500 students. Of those, 216 have gone on to graduate study in the sciences, engineering, mathematics, or technology fields, and 122 have pursued other disciplines. Her mentees have earned 36 PhDs, 29 MDs, and 97 MS degrees, with many students remaining in the pipeline. Her principal programs, and accomplishments, include:

Ronald E. McNair Post-baccalaureate Achievement Program: Funded by the U.S. Department of Education, McNair has provided research experiences and graduate school preparation for low-income, first-generation, and underrepresented minority college students since 1992. Olivares has mentored approximately 400 McNair students. To date, 366 McNair Scholars have earned their bachelor's degrees, and fully 70% of alumni have earned at least one graduate degree (58% of those degrees are in STEM fields).

David T. Kearns Science and Engineering Scholars: First started in 2002, the Kearns program supports minority and low-income students intending to pursue study in STEM. It provides scholarships, study groups, summer courses, research experiences, internships and more to approximately 80 students per year. To date, Dr. Olivares has mentored 100+ Kearns Scholars. Of those who have earned their bachelor's degrees, 49% have gone on to graduate study in STEM. She has garnered over \$6 million in federal and corporate support for the Kearns Center.

Xerox Engineering Fellows: Created in 2009 with a generous gift from the Xerox Foundation, this summer research program for engineering students duplicates the McNair program, without income or ethnicity eligibility criteria. A total of 55 students have participated; 13% are minority students and 31% are female. Ninety percent of the class of 2010 enrolled in graduate programs in engineering, and 77% of the class of 2011 have enrolled in graduate study.

As a pre-major advisor, Dr. Olivares has counseled hundreds of incoming minority and female undergraduates at the University of Rochester. Through the Kearns program, she has developed *The Merchants of Hope*--a pre-college outreach activity for low-income high school students in the Rochester area.

Her mentees have won Fulbright Scholarships, National Science Foundation Graduate Research Fellowships, Goldwater, Gilman, and NASA Graduate Fellowships, and many other prestigious awards. They are doctors, lawyers, surgeons, professors, researchers (in industry, higher education, and federal and state governments), dentists, veterinarians, and members of the US military.

Dr. Olivares serves on numerous boards and committees, including the Minority Graduate Education Committee of the Educational Testing Service, and the Council for Opportunity in Education.

Ms. Elizabeth A. Parry, Coordinator, STEM Partnership Development, College of Engineering, North Carolina State University

Ms. Elizabeth Parry is recognized as a Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring for her work that has included personal mentoring, tiered mentoring, and teacher professional development, and its impact on K-12, undergraduate, and graduate students who are underrepresented in science, technology, engineering, and mathematics (STEM).

Following graduation from the University of Missouri, Rolla in 1983, Ms. Parry went to work for IBM in Charlotte, North Carolina. After her children started school, she realized a need to bring hands-on science instruction to K-12 classrooms. Her passion for engineering led her to a simple fact: If students are never exposed to STEM in an engaging and integrated way, they are unlikely to pursue careers in those fields.

That vision led her and another engineer to start the *Science Surround* program and for the next eight years they brought science and engineering to thousands of children through classroom visits, assemblies and summer camps. In 1999, she joined the newly formed K-12 Outreach group of North Carolina State University's (NCSU) College of Engineering and since then she has focused her efforts on students from underrepresented groups, including those from high poverty homes.

In 2003, she and two colleagues received grants from both the General Electric Foundation and the National Science Foundation's (NSF) Graduate Fellows in K-12 Education program to begin the RAMP-UP (Recognizing Accelerated Math Potential in Underrepresented People) program. To date, 54 undergraduate and graduate students have been mentored through the program.

As Project Director/Co-PI she established an effective tiered mentoring system involving graduate students, undergraduates, K-12 students, parents and teachers. Several of the practices developed under RAMP-UP are sustained at NCSU today and are the model for similar programs elsewhere.

Ms. Parry's teacher professional development was designed to equip teachers in K-12, particularly K-5, to be more confident about their ability to use engineering design as a pedagogical approach and to integrate other core subjects using it.

Through the mentoring efforts over the past twenty years, Ms. Parry has reached 150 K-12 teachers, nearly 85 undergraduate and graduate students, and through their efforts has touched the learning lives of approximately 15,000 K-12 students over the last 15 years.

Her affiliations and activities include:

- founding member and current Chair of the American Society for Engineering Education (ASEE) K-12 and Precollege Division, an 800 member group of university researchers, industry engineers, and K-12 teachers;
- member of the Board of Directors of the Triangle Coalition for Science and Technology Education;
- co-author of over 35 papers on research and practice in K-12 engineering education, increasing presentation of minorities in STEM, and student retention issues; and
- co-author of the book *Teaching Engineering Made Easy*²

Dr. Sandra L. Petersen, Professor and Associate Graduate Dean, Veterinary and Animal Science, University of Massachusetts, Amherst

Dr. Petersen is a neuroendocrinologist at the University of Massachusetts, Amherst (UMA) whose work has been continuously funded by NIH for 24 years. She is a national science advisor through her appointment on the Environmental Protection Agency's Board for the Reassessment of Dioxin.

She is Director of the Northeast Alliance for Graduate Education and the Professoriate (NEAGEP), a consortium of ten large universities in the Northeast (Rutgers, The State University, Boston University, Massachusetts Institute of Technology, Pennsylvania State University, and all the New England state flagship campuses) paired with five minority-serving Historically Black Colleges and Universities (HBCUs): Jackson State University, Lincoln University, Medgar Evers College, Bennett College, and the University of Puerto Rico, Mayagüez. Faculty at NEAGEP institutions are paired with faculty at the HBCUs for a faculty residence program which builds research collaborations and networks among the HBCU faculty and students with the other NEAGEP partner institutions.

She has personally mentored more than 45 undergraduate and graduate students from groups underrepresented in STEM fields (of whom 20 have earned the PhD). Her mentoring strategy is simple and compelling:

- Build a supportive community;
- Create an atmosphere of confidence;
- Engage in multi-tiered mentoring beginning at undergraduate matriculation;
- Develop student professional networks;
- Re-adjust when circumstances call for it; and
- Integrate programs across departments, and from the undergraduate to graduate levels.

In her ten years as NEAGEP director, Petersen led the Amherst campus in tripling minority student enrollments in STEM graduate programs and retaining the students through degree completion. Enrollment of minority students in STEM programs increased from 22 before NEAGEP to a current enrollment of 63; and the retention rate rose from 45% to approximately 80%, higher than the persistence of majority students.

Across the entire UMA-led NEAGEP, students in the STEM PhD. pathway increased 63%, compared to the national average increase of 35% across all other projects under NSF's Alliances for Graduate Education and the Professoriate. Moreover, the total enrollment of minority students in NEAGEP STEM PhD programs increased from 540 before NEAGEP to 1100 in 2011-2012, and the annual number of degrees earned increased from approximately 75 before NEAGEP to 119.

Recently, Petersen created and now leads the University of Massachusetts Amherst's STEM Diversity Institute (SDI). This is a novel integration of new and existing programs to extend inclusion at every level: K-12 outreach, community colleges, undergraduates, graduates, post-doctoral fellows, and faculty. SDI encompasses efforts both at Amherst and at partner institutions. It provides the strategies for broadening participation such as multi-tiered mentoring across disciplines, coordination with national efforts focused on diversifying the science work force, and the integration of evaluations and action-research that are critical for improving best practices in the field.

As Director of NEAGEP, Dr. Petersen has added programs to enhance the ability of campuses in the NEAGEP group to recruit and retain historically underrepresented groups in STEM disciplines. Activities she has initiated include:

- The NIH Post-baccalaureate Research Education Program for candidates in biomedical fields;
- An award in cellular engineering with strong female and minority leadership participation under the NSF Integrative Graduate Education and Research Traineeship program;
- Building campus-wide buy-in for a project to increase the presence of minority women in leadership positions; and
- Preparing a proposal for a NIH Institutional Research and Academic Career Development Award, a Minority Males in STEM Institute grant, and a NIH Bridges to the Baccalaureate Program.

Dr. John Tilak Ratnanather, Assistant Research Professor, Center for Imaging Science, Department of Biomedical Engineering, Institute for Computational Medicine, The Johns Hopkins University

Dr. John Ratnanather is recognized as a Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring for his challenging and successful work in recruiting and mentoring an unprecedented number of deaf and hard-of-hearing (HOH) individuals into STEM fields.

Dr. Ratnanather was the first congenitally deaf person to earn an undergraduate degree in mathematics from University College, London in 1985 and in 1989 he became the first ever congenitally deaf individual in the world to be graduated with a doctorate in mathematics, which he earned from Oxford University. His interest in post-doctoral research in the auditory sciences brought him to Baltimore, Maryland and the Johns Hopkins University School of Medicine. Dr. Ratnanather's research interests include mathematical models for image analysis of brain structures implicated in a variety of neuropsychiatric and neurodevelopmental disorders.

There is a simple and powerful objective for Dr. Ratnanather's mentoring programs: to provide opportunities for education and research in science, technology, engineering, and mathematics (STEM) for deaf and HOH individuals who may not have otherwise been exposed to STEM, and to achieve this objective through extensive and involved networking so that his protégés can later serve as mentors themselves.

The lack of accommodations for the deaf and HOH at annual meetings of the Association for Research in Otolaryngology (ARO) led Dr. Ratnanather to begin his work to recruit deaf and HOH students and provide the accommodation that allows them to participate in professional meetings. His success is clearly documented: In 1991, there were only two deaf and HOH individuals pursuing studies in the auditory sciences: one graduate student and Dr. Ratnanather himself. In 2011, there were seven deaf and HOH faculty members in the auditory sciences, with more than 15 currently pursuing graduate degrees in that field.

Dr. Ratnanather has personally mentored 13 deaf or HOH students in both STEM and medical school programs (five of whom are pursuing careers in medicine). His mentoring work includes 20 hearing female students, all of whom have pursued doctoral degrees in STEM. The Johns Hopkins Office of Academic Advising regularly asks Dr. Ratnanather to be a mentor for incoming deaf or HOH undergraduate students.

Dr. Ratnanather's activities include:

- establishment of the Hearing Impaired- Association for Research in Otolaryngology
- group in 1992 (currently 30 members);
- service on the Alexander Graham Bell (AGBell) Financial Aid Committee since 1996
- (Chair from 2005 to the present);
- began online forums and social media networks to connect deaf
- and HOH students to AGBell resources;
- service in the Disabled Scientists and Engineers Section of the AAAS since 1986;
- service as co-chair of the Research Symposium at the biennial International
- Convention of AGBell since 2005; and
- collaboration on a database to connect scientists at the National Institute on
- Deafness and Other Communication Disorders (NIDCD) with deaf and HOH

Dr. Ratnanather has been awarded postdoctoral fellowships by the National Science Foundation and the Royal Society of London-Australian Academy of Sciences. He has participated in numerous colloquia and given invited presentations in major academic and medical centers around the world. His publications (books, chapters, editorials, and peer-reviewed papers) are extensive.

Dr. John B. Slaughter, Professor of Education and Engineering, University of Southern California

Dr. John B. Slaughter is recognized as a Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring for more than four decades of successful efforts to increase the representation and equitable inclusion of African-American, American Indian and Latino women and men in the scientific and engineering fields.

Dr. John Slaughter is a former director of the National Science Foundation, former President of the University of Maryland College Park, and former President of Occidental College. He has served for many years as a leader in the education, engineering and scientific communities.

Dr. Slaughter earned a Ph.D. in Engineering Science from the University of California, San Diego (UCSD), and his M.S. in Engineering from the University of California Los Angeles (UCLA) and a B.S. in Electrical Engineering from Kansas State University.

Dr. Slaughter began his career as a licensed professional electronics engineer at General Dynamics, and later served for 15 years at the U.S. Navy Electronics Laboratory in San Diego. During this time, he organized a group of his engineering colleagues to mentor inner-city high school youth to encourage them to study science and mathematics.

From 1975-1977, Dr. Slaughter served as the Chair of the Institute of Electrical and Electronics Engineers (IEEE) Minority Committee. As chair he created programs that continue to support generations of engineering students at Historically Black Colleges and Universities (HBCUs). During this same period of time, Dr. Slaughter also served as the Director of the Applied Physics Laboratory (APL) at the University of Washington where he advised and mentored numerous African-American engineering students, many of whom were experiencing a sense of isolation and alienation because of the absence of role models and support systems in the College of Engineering.

Dr. Slaughter has personally mentored many young scientists and engineers personally, but the true impact of his mentorship comes from his leadership and initiatives over his 40-year career. As President and CEO of the National Action Council for Minorities in Engineering, Inc. (NACME), Dr. Slaughter grew the association the organizations partnerships from 13 to 50 institutions and served as a founding member of a consortium with a goal to create 110 urban high school academies of engineering in locales with large underrepresented minority populations. Through his initiatives and vision, NACME has reached and mentored 10,000 students in the past five years.

Dr. Slaughter is a member of the National Academy of Engineering (NAE), elected for his excellence and contributions to the field of electrical engineering research. He served on its Committee on Minorities in Engineering, co-chaired its Action Forum on Engineering Workforce Diversity, and served two terms on the NAE Council.

Dr. Slaughter holds honorary degrees from 30 colleges and universities. He is the recipient of the first U.S. Black Engineer of the Year Award in 1987, and was awarded the Martin Luther King Jr. National Award in 1997. He also was appointed by President George W. Bush to membership on the President's Council of Advisors on Science and Technology (PCAST).

Dr. Julio G. Soto, Professor of Biology, San Jose State University

Dr. Julio Soto earned his PhD in molecular and cell biology from the University of California at Berkeley, and has over 13 years of mentoring work with students and faculty at San Jose State. His mentoring is characterized by a key lesson that drives his efforts and experiences: effective mentoring approaches are needed throughout one's academic training and professional life. Dr. Soto's guide to mentoring entails (1) tailoring the mentor activity to each group of students' academic and career aspirations and (2) maximizing the impact of mentoring by:

- Mentoring students who aspire to be K-12 public school teachers;
- Providing research and mentoring opportunities to students;
- Creating new academic programs and curriculum to expose students to research;
- Mentoring tenure-track professors to earn tenure and become great mentors; and
- Actively participating in national leadership positions.

Beginning in his early years as a graduate student at the University of California, Berkeley and up to the present, Dr. Soto has personally mentored 61 individuals from groups underrepresented in STEM (35 females and 26 males). He has also developed nationally funded programs that have mentored 96 additional students.

Three of his mentees are now tenured science teachers at the secondary school level. Fifteen of his students have completed, or are nearing completion of their baccalaureate programs. Seven of his mentees have earned or are nearing completion of their master's degree programs, and nine have received advanced degrees in health-related programs. Eleven individuals under Dr. Soto's mentorship have completed or are currently pursuing their PhD degrees. At the present time, twelve graduate and undergraduate students at San Jose State are working in, and being mentored in, Dr. Soto's research laboratory.

Dr. Soto uses different strategies to assist his mentees in understanding and exceeding expectations in order for them to attain their educational or professional goals. For example, for undergraduate students, the strategies include (1) providing academic advice that is tailored to their professional aspirations; (2) finding summer internships that are appropriate to each individual's strengths, weaknesses, and desired academic or professional paths; (3) writing effective letters of reference, and (4) assisting students with the academic or professional application process.

For future science teachers, Dr. Soto recommends (1) providing feedback for possible science lessons where appropriate inquiry or other teaching strategies are used; (2) performing formative on-site student teaching evaluations; and (3) when possible, providing information and feedback about potential funding sources.

For university colleagues, the strategies include (1) discussing effective strategies to manage time for course development; (2) setting up their research group, mentoring students, and service committee selection; (3) Including students as proposal co-Principal Investigators in order to provide mentoring in the process of grant writing and funding; and (4) reviewing tenure/promotion dossiers and providing timely and effective feedback.

Regardless of their future academic or professional goals, Dr. Soto encourages all of his mentees to experience scientific research first hand. He has personally involved 80% of his mentees in research. Furthermore, he advises students that publishing is an important achievement that increases their opportunities to be admitted into advanced academic degree programs or pursue careers in science-related professions.

The *GeoFORCE* Program, The Jackson School of Geosciences, The University of Texas at Austin

GeoFORCE is recognized as a Presidential Awardee for Excellence in Science, Mathematics and Engineering Mentoring for its remarkable success encouraging underrepresented minority students from rural South Texas and inner-city Houston to take on the challenges of a rigorous mathematics and science curriculum and pursue higher education in these fields.

Each summer *GeoFORCE* takes more than 600 high school students on geosciences field trips across the U.S., including spectacular locations such as the Grand Canyon, Zion National Park, and Mount St. Helens, to name just a few. The trips are led by university faculty and research scientists and students are mentored by professional geologists from *GeoFORCE* industry partners. The trips engage and empower the students by exposing them to spectacular field-based experiences and the program continues to motivate and monitor participating students each year of their high school career and into college. Beginning in 2010, *GeoFORCE* added a formal college mentoring and support program.

GeoFORCE currently works with 900 students from grades 9 to 15, adding 160 students annually. About 64% of the students are girls. To date, the high school graduation rate is 100% and the college matriculation rate is over 95%. Currently, 287 *GeoFORCE* participants have graduated from high school and 267 are enrolled in over 50 colleges and universities throughout the US.

The *GeoFORCE* model employs a targeted approach to reach areas of Southwest Texas and urban Houston (both areas have a high percentage of minority students).

GeoFORCE professional staff identifies students (beginning in the eighth grade) who have shown a proclivity to excel in school. Each of the four years of their participation students (grades 9-12) are engaged with science *outside* the classroom. The program continues its mentoring activities through college graduation with counseling and financial aid support. The *GeoFORCE* approach builds on seven key features:

- Recruit them young; keep them engaged
- Target high-needs areas
- Keep the focus on college
- Use geosciences to engage and inspire
- Surround students with good academic and career role models
- Provide support at critical transitions