

22nd Annual

Institute on Teaching and Mentoring

Exploring New Research Frontiers for Future Generations



THE
COMPACT *for*
FACULTY
DIVERSITY

October 2015



Institute Scholar Research

Robin Brewer, Online and Social Interaction for Older Adults, AGEP

David Buckman, High School Graduation Rates, SREB

Ann Charles, Predictive Food Microbiology, AGEP

Tina Cheuk, Science Education and English Language Learners, Stanford EDGE Scholar

David Cure, Tunable Antennas and Devices, SLOAN

April Torres Conkey, Wildlife Education and Outreach, SREB

Angela Cooke-Jackson, Intercultural Communications on Public Health, SREB

Denise Davis-Maye, Social Uplift and Community Development Models, SREB

Ramón Emilio Fernández, Mathematics Education and Policy, AGEP

Maurice Fluitt, Type 2 Diabetes in African Americans, AGEP

Elena Foulis, Oral History and Latino Studies, SREB

Marisa Franco, Psychological Impact of Racial Identity Invalidation, AGEP

Alexandria Graves, Environmental Soil Microbiology, SREB

Meseret Hailu, Gender Disparities in STEM Programs in Higher Education, GATES

Eric Hairston, African American Literature, SREB

Antentor Othrell Hinton, Neurogenic Hypertension, FASEB

Kimberly Hobbs, Role of Genetic Changes in Cardiovascular Disease, BRIDGES

Vicki-Lynn Holmes, Statistics and Mathematics Education, SREB

Cheryl Hopson, African American Literature and Feminism, SREB

Tiffany Katz, Breast Cancer Prevention, SREB

Laquanda Leaven, Scheduling and Supply Chain Management, SLOAN

Miguel Lugo, Transportation Planning and Operations, BRIDGES

Stephanie Lusk, Medical Marijuana Use, SREB

Abria Magee, Human Microbiome, SLOAN

Jeremy Magruder, Pavement Materials, AGEP

(continued on inside back cover)

Exploring New Research Frontiers for Future Generations

The Institute on Teaching and Mentoring (Institute) over the past 22 years has partnered with states, institutions and multiple organizations to achieve the goal of diversifying the nation's postsecondary faculty.

The organizations have included the Alfred P. Sloan Foundation, the Gates Millennium Scholars Program, the National Aeronautics and Space Administration (NASA), the National Institute of General Medical Sciences Bridges to the Professoriate (NIGMS/NIH), the National Science Foundation Alliances for Graduate Education and the Professoriate (AGEP/NSF), the Ronald E. McNair Postbaccalaureate Achievement Program, the Southern Regional Education Board and the Western Interstate Commission for Higher Education.

Highlighted in this publication are 16 graduates from programs sponsored by these organizations. After completing doctoral programs, these scholars have established academic careers and are contributing significant research in their respective disciplines. Their presence helps diversify their academic communities by bringing fresh perspectives to their disciplinary, local and global communities.

Every fall, underrepresented minority doctoral scholars — along with their mentors — representing more than forty states, the District of Columbia and Puerto Rico, and more than 100 academic disciplines, begin the journey these graduates have made. They convene at the Institute to learn from experts, network with peers and develop skills to prepare to teach and conduct research in postsecondary institutions. The Institute strives to motivate, inform and inspire these scholars to investigate their world fully so they can participate in a better community for those around them.

This publication recognizes the cutting edge research that the 16 former Institute scholars and doctoral program graduates from the partner organizations are conducting in their current faculty and research positions. From preventing the spread of infectious diseases to discovering ways to prevent concussions in student athletes, the scholars are exploring new research frontiers for future generations, and Institute scholars continue to be inspired by them.

The power of regeneration

Dr. Cristian Aguilar

Assistant Professor of Biology
Azusa Pacific University, Azusa
Ronald E. McNair Scholar

How would quality of life change if damaged cells could regenerate? Dr. Cristian Aguilar is seeking to answer that question. He works with the axoloti, a salamander, known for its tendency to regulate genes that stimulate limb regeneration and wound healing. Dr. Aguilar's projects are aimed at studying differences in the healing processes between regenerating and non-regenerating wounds. He hopes to gain key insights that could help the human body spur its own wound and disease healing. Dr. Aguilar feels that the Institute provided him with a valuable network and helpful teaching techniques that can be implemented in the classroom.



Addressing media's influence on gender bias and social justice

Dr. Angela Andrade

Assistant Professor of Psychology
University of Arkansas at Pine Bluff
Ronald E. McNair Scholar

Does the media play a role in sexism and racism? Dr. Angela Andrade's research carefully examines this question. Her focus is primarily on issues of social inequality based on race, class and gender. Specifically, she investigates the impact of novels such as *Twilight* and *Fifty Shades of Grey*, which she posits incorporate forms of sexism or the endorsement of negative gender attitudes. Dr. Andrade hopes her research will reveal how damaging gender and racial bias in media can be, and what influence it has on those who engage with it. Dr. Andrade's experience at the Institute gave her insight into effective mentoring relationships, teaching and diversity in higher education.

Using forecasts of the future to fight disease in the present

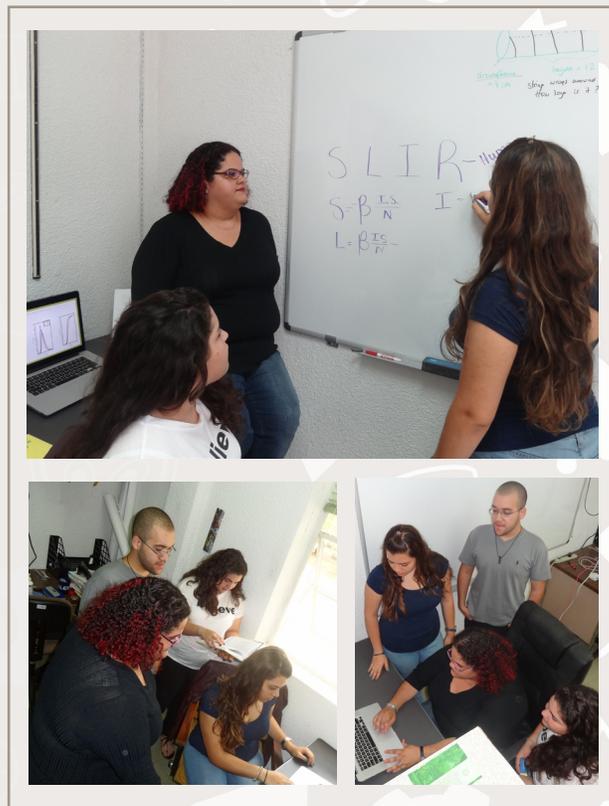
Dr. Mayté Cruz-Aponte

Assistant Professor of Mathematics and Physics

University of Puerto Rico at Cayey

Alfred P. Sloan Scholar

Dr. Mayté Cruz-Aponte hopes to develop meta-population models that permit agencies to preview the results of their decisions and strategies to fight the development of epidemic diseases. She has built models that realistically measure disease and population parameters that fit real case scenarios with the intent to prevent unforeseen negative consequences. Her research has been funded by The Institute for Interdisciplinary Research, the National Institute for Minority Health and Health Disparities and the Research Initiatives for Scientific Enhancement Program at the University of Puerto Rico at Cayey. Dr. Cruz acknowledges that the Institute gave her the strength to finish her degree and reassured her of her importance in the academic community.



The impact of discrimination in the workplace

Dr. Jessica DeCuir-Gunby

Assistant Professor of Educational Psychology and

Director of Graduate Programs

North Carolina State University, Raleigh

SREB Doctoral Scholar

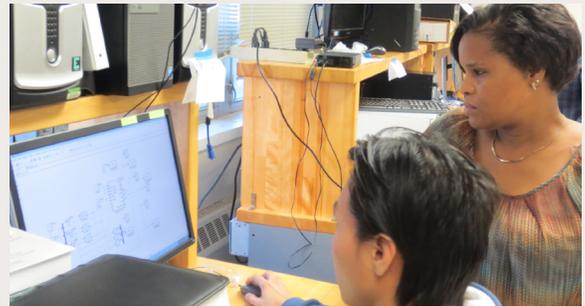
Dr. Jessica DeCuir-Gunby studies racial microaggressions as conscious or subconscious negative gestures that convey hurtful messages regarding racial minority group membership. Dr. DeCuir-Gunby studies the impact of racial microaggressions on African Americans' job satisfaction and understanding how microaggressions impact African Americans emotionally. She hopes her research will lead to strategies to confront and cope with these occurrences. Dr. DeCuir-Gunby credits the Institute with providing relevant information on the process of attaining tenure and a supportive place to ask difficult questions about her own experiences with racial microaggressions.

Harnessing electricity as a sustainable energy source

Dr. Shanelle Foster

Assistant Professor of Electrical and Computer Engineering
Michigan State University, East Lansing
Alfred P. Sloan Scholar

Driving to work, making breakfast, or spending an afternoon on the computer would be difficult without electrical machines. Dr. Shanelle Foster's research aims to improve upon the performance, reliability and manufacturability of electrical machines to make them more energy efficient. Success in creating more reliable electrical machines can lessen U.S. dependency on oil, reduce greenhouse gas emissions and produce low cost and highly efficient appliances. Dr. Foster described her experience at the Institute as, "extremely invigorating and informative; it provided me an opportunity to connect with professionals that introduced me to tools that have enhanced my writing skills."



Exploring the connection between freight data and our nation's air quality

Dr. Sarah Hernandez

Assistant Professor of Civil Engineering
University of Arkansas, Fayetteville
AGEP Scholar

How can transportation agencies help to monitor air quality standards? Dr. Sarah Hernandez discovered that commercial vehicle data, including operating characteristics and the body class of the trucks, are not readily available for transportation and air quality management agencies to use in travel or pollution forecasting. Dr. Hernandez has developed an approach to solving this problem by using weigh-in-motion systems and advanced inductive loop detectors to produce data on truck air quality. Dr. Hernandez hopes that this will assist agencies in developing policies to mitigate air pollution. The Institute showed her that despite feelings of isolation, she could be a successful minority Ph.D. student. She hopes to provide the same atmosphere for female and minority engineering students.

Enhancing opportunities for deaf and hard of hearing students

Dr. Serena Johnson

Assistant Professor of Communication Disorders and Deaf Studies
California State University, Fresno
Gates Millennium Scholar

Too often, research related to students with hearing loss is aimed at students in deaf-serving institutions only. However, many students with hearing loss attend non-deaf serving institutions. Through her research, Dr. Serena Johnson's goal is to examine a broader scope of the experiences of deaf and hard-of-hearing students as they navigate college. She hopes that by studying these students' experiences, she will help create strategies to facilitate improved access to resources for more students and eliminate barriers for students with hearing deficits at postsecondary education institutions. Dr. Johnson credits the Institute with providing her with valuable networking opportunities and attaining skills that assisted her in negotiating a faculty offer.



The power of communication in an evolving work landscape

Dr. Shawn D. Long

Professor of Communication Studies and Organizational Science
University of North Carolina at Charlotte
SREB Doctoral Scholar

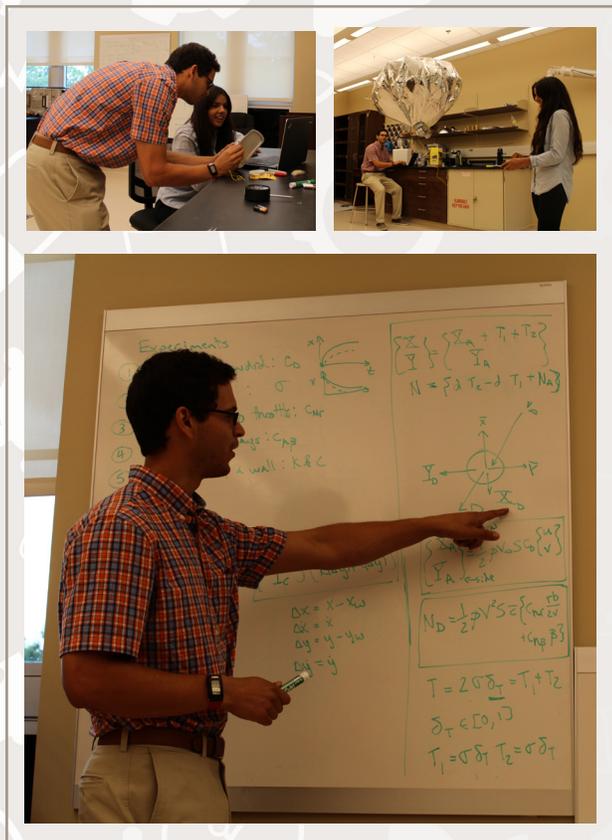
Now, more than ever, companies and their employees are communicating and working digitally. Dr. Shawn Long is studying these new dynamics, and his work has helped facilitate the emerging field of virtual work research among communication and organizational scholars. His recent research examines how American corporations socially construct their diversity values, goals and priorities on company websites. Dr. Long sees his research helping companies adopt more inclusive language and organizational practices for minority employees. He hopes they see the benefits of attracting a workforce that is not only talented but also diverse. The Institute helped Dr. Long understand the need for professors who looked like him at the front of the classroom.

Saving two billion people from tuberculosis

Dr. Albanus Moguche

Postdoctoral Scientist
Seattle Biomedical Institute
FASEB Scholar

The World Health Organization has estimated that around one third of the world population is currently infected with tuberculosis. Drug resistant strains and limited reaches of the current vaccine have contributed to continued fatalities from this disease. Dr. Albanus Moguche is developing a new vaccine that may overcome these problems. He is studying strategies to fight the infection by properly activating T cells within the lungs — which help enable protection from the virus. He has received funding from the National Institutes of Health and the Paul G. Allen Family Foundation. He credits the Institute on Teaching and Mentoring with motivating him to consider a career in academic research.



Using multiple autonomous aircraft to map wind patterns

Dr. Carlos Montalvo

Assistant Professor of Mechanical Engineering
University of South Alabama, Mobile
Alfred P. Sloan Foundation Scholar

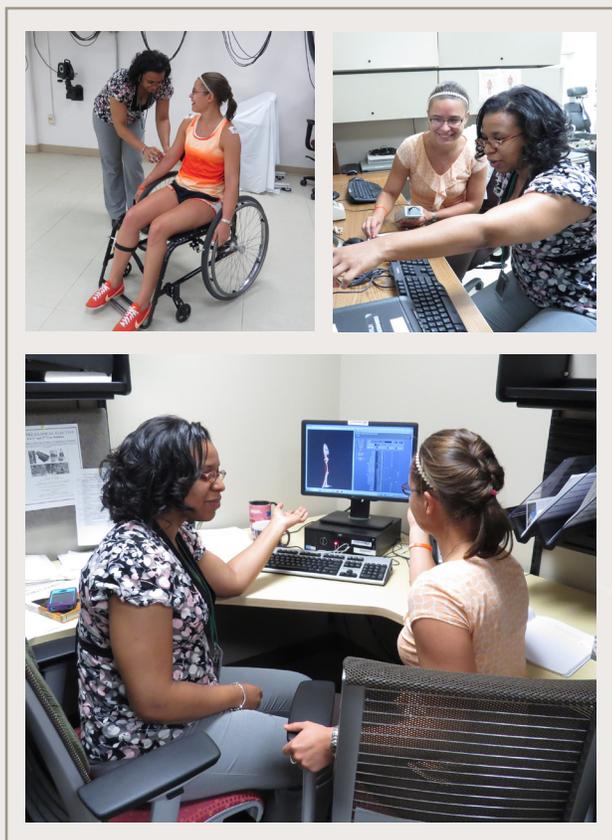
Changes in our environment have spurred a need to understand current weather patterns better. Dr. Carlos Montalvo aims to help others understand and prepare for these changes in our atmosphere. Dr. Montalvo has developed an atmospheric windmapper that can create an accurate representation of a three-dimensional wind field. Dr. Montalvo's hope is that this approach will provide data to effectively monitor weather patterns. The Institute gave Dr. Montalvo a stronger desire to be an active part of the Sloan community — and become a mentor to students. It also gave him a sense of pride in all that he's accomplished, given the hardships he has faced.

Preventing long-term effects of concussions among student athletes

Dr. Nicholas Murray

Assistant Professor, Health and Director of Concussion Research
Georgia Southern University, Statesboro
FASEB Scholar

Dr. Nicholas Murray is attempting to understand and model the concussion recovery process in student athletes. He discovered that many athletes suffering with concussions were returning to play without full recovery. His research aims toward understanding the long-term effects of concussions along with development of appropriate tools and legislative policies to prevent life-long impairments for all age ranges. The research group headed by Dr. Murray has been funded by the National Institutes of Health and the Department of Defense. His experience at the Institute exposed him to a large group of colleagues who share similar ideas and goals in biomedical research. Many of these individuals have become lifelong friends and research collaborators.



Enabling those with spinal cord injury to be more independent

Dr. Brooke Odle

Postdoctoral Scholar, Department of Biomedical Engineering
Case Western Reserve University, Cleveland
AGEP Scholar

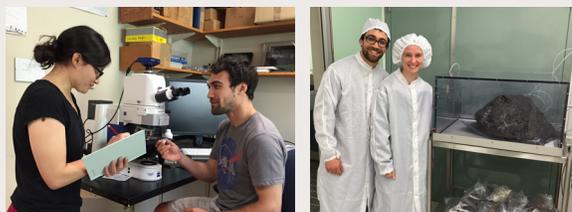
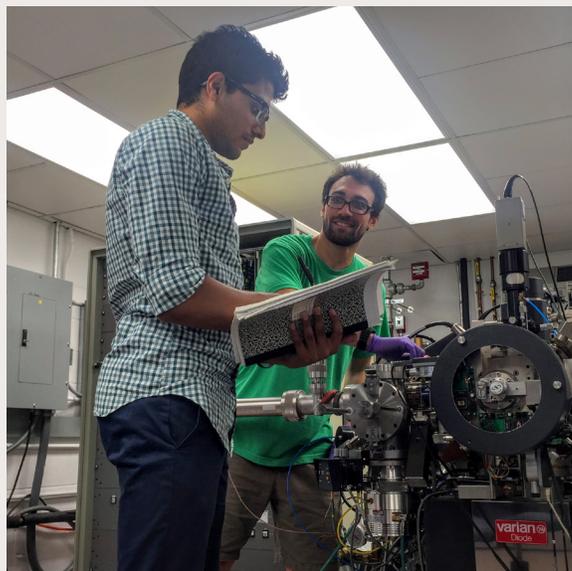
Dr. Brooke Odle is using her research to improve neuroprostheses for individuals with spinal cord injury. These neuroprostheses use stimulation to enable users to stand erect from a seated position in their wheelchair and perform certain tasks without additional support. Current devices limit the mobility of patients, making it difficult for them to perform needed tasks. Dr. Odle's research seeks to improve these devices by studying how to increase the distance the users can stand and move. Success of this research will mean increased independence and safety for users. This work is funded by the National Institute of Neurological Disorders and Stroke. Dr. Odle's Institute experience introduced her to Institute faculty and presenters who continue to encourage and mentor her.

The origins of water on earth

Adam Sarafian, Ph.D. Candidate

Woods Hole Oceanographic Institution and the Massachusetts Institute of Technology
NASA Harriett G. Jenkins Scholar

Many scientists feel that water could not have arrived during the formation of earth because of the extremely hot conditions. So, how else could water appear on our planet? Mr. Adam Sarafian, along with his advisors at WHOI and the NASA-Johnson Space Center, are using the analysis of the composition of meteorites to determine how water was added to the inner solar system. Mr. Sarafian's research will help scientists and the general public understand the solar system in which we live and other systems that could potentially house life. Mr. Sarafian acknowledges that the Institute allowed him to interact with peers across disciplines and better prepared him for a scientific career.



Enhancing safe and sustainable energy sources

Loraine Torres-Castro, Ph.D. Candidate

University of Puerto Rico, Rio Piedras
and Research Intern at the NASA Jet Propulsion Laboratory
NASA Harriett G. Jenkins Scholar

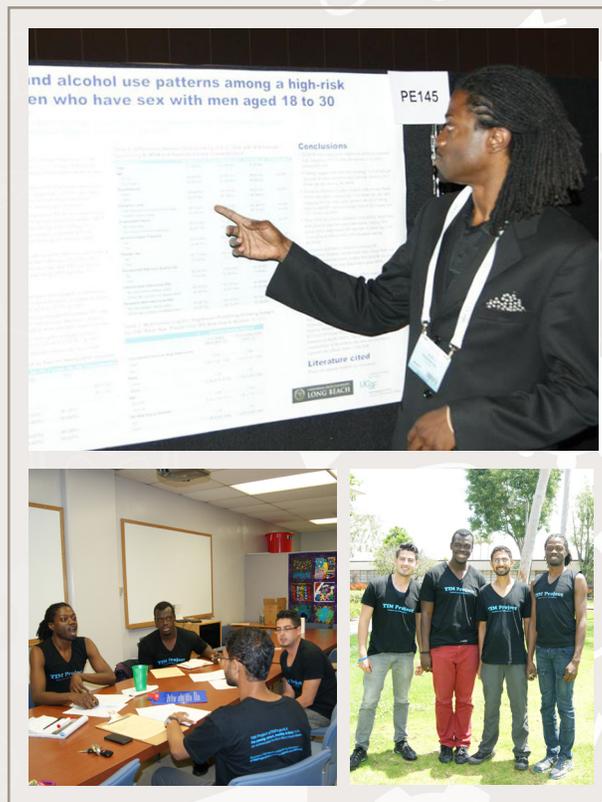
Commercial use of rechargeable Lithium-ion batteries (Li-ion) has changed the portable electronics industry. Ms. Torres is looking to improve the safety and performance of these batteries and to understand the electrochemical processes involved in their development. The results are important to the National Aeronautics and Space Administration (NASA), as any increase in sustainability of the battery will enable NASA to power its applications better. Ms. Torres also shares her research with middle grades and high school minority students to encourage them to seek careers in STEM. Ms. Torres credits the Institute with helping her realize that she was not alone in the Ph.D. journey, and that there were other students like her.

Presenting 21st century solutions to HIV testing

Dr. Thomas Alex Washington

Professor of Social Work
California State University, Long Beach
SREB Doctoral Scholar

Can social media encourage young adults to receive testing for HIV? Dr. Thomas Alex Washington created and headed the Testing Intervention Model (TIM) to develop and pilot-test an intervention to increase HIV testing among young black homosexual men. Black men ages 18 to 30 were invited to a Facebook group about HIV prevention and testing where they were encouraged to host discussions related to HIV prevention topics. These interactions will help medical agencies better convey HIV testing information, utilize social media in reaching more homosexual black men and increase access to knowledge about HIV. Dr. Washington credits the Institute with strengthening his ability to earn tenure through seminars, workshops and professional development resources.



Understanding the link between protein structure and disease

Dr. Sarah Junco Wong

Postdoctoral Fellow, Medicinal Chemistry, College of Pharmacy
University of Texas at Austin
Bridges Scholar

Dr. Sarah Junco Wong is researching the structure of an enzyme that is linked to the development of cancer and other diseases. Understanding the body's misregulation of Eukaryotic elongation factor 2 kinase (eEF-2K) may lead to therapeutics that can help treat and prevent several chronic illnesses, including cancer and Alzheimer's disease. Her research is currently funded by NIH's Institutional Research and Academic Career Development Awards (IRACDA) and was previously funded by the NIH-NIGMS F31-Diversity Fellowship. Dr. Wong credits the Institute with exposing her to the IRACDA and grant writing skills. The Institute also provided her mentor with skills to better guide minority students.

Institute attendance by year



* projected

2014 facts and figures

Institute Data

- 1,240 attendees
- 45 states represented by participants (includes District of Columbia and Puerto Rico)
- 77 graduates recognized
- 75 recruiting institutions represented
- 200 recruiter representatives
- 103 disciplines represented
- first time - 47%
- female - 60%, male - 40%
- African American - 59%
- Asian American - 3%
- Hispanic American - 20%
- American Indian/Native American - 2%
- Caucasian - 12%
- Other race - 4%

Attendance by Discipline

- Business & Management - 4%
- Education - 17 %
- Health Professions - 2 %
- Humanities - 10 %
- Mathematics 3%
- Science & Technology - 32%
- Engineering - 11 %
- Social & Behavioral Sciences - 21 %

Research is creating new knowledge.

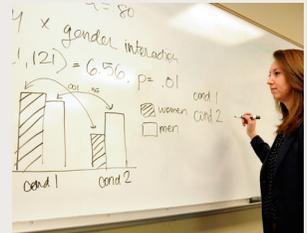
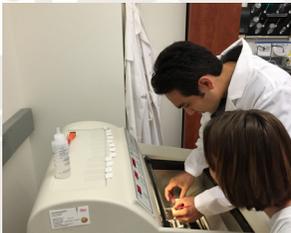
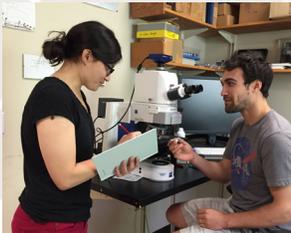
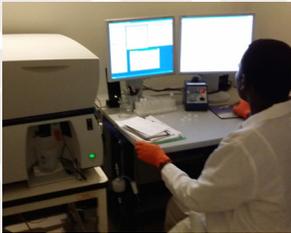
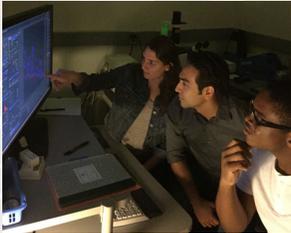
— Neil Armstrong



The Compact for Faculty Diversity is pleased to recognize these partner organizations:

- Alfred P. Sloan Foundation Minority Ph.D. Program
- Gates Millennium Scholars Program
- National Aeronautics and Space Administration Harriett G. Jenkins Predoctoral Fellowship Project
- National Institute of General Medical Sciences: Bridges to the Professoriate
- NIH Common Fund/National Research Mentoring
- National Science Foundation Alliances for Graduate Education and the Professoriate
- Ronald E. McNair Postbaccalaureate Achievement Program
- Southern Regional Education Board
- Western Interstate Commission for Higher Education

Research is to see what everybody else has seen . . .



and to think what nobody else thought.

— Albert Szent-Gyorgyi

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