

*The National Academies of  
Science, Engineering & Medicine*

**Developing SEM Identities - Supporting Black Students through their SEM  
Career Journeys**



**Broadening and Strengthening the Pipeline of Black College Students in SEM**

**Dr. Reggie Blake**

**Interim Provost and Dean of Curriculum and Research**

**New York City College of Technology**

**May 2, 2022**

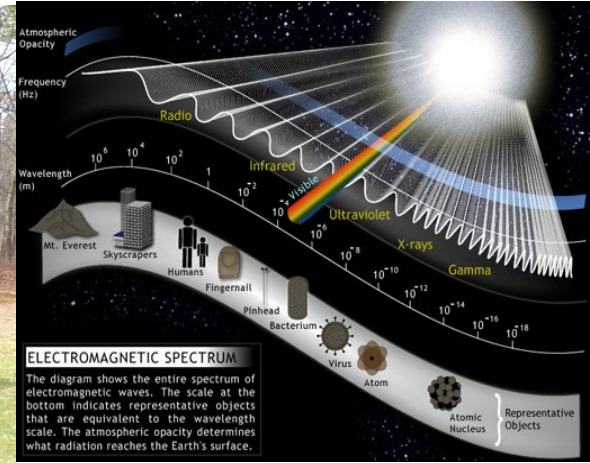
*The National Academies of  
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**Developing SEM Identities - Supporting Black Students through their SEM Career Journeys**

**Presentation Outline**

- **Black Male Initiative Program at the New York City College of Technology (City Tech)**
- **NSF Research Experiences for Undergraduates Program at City Tech**
- **NSF Improving Undergraduate STEM Education (GeoPaths Up) Program at City Tech**
- **Corner Stone, Guiding Strategies – What Works**





# New York City College of Technology

## CUNY BMI's STEM-Designated Black Male Initiative Program

**Broadening and Strengthening the Pipeline of Black College Students in SEM**



**Black Male Initiative**  
CITY TECH

# City Tech's BMI History

- GENESIS (2005 –15 Students)
- NOW SERVED OVER 8,100 STUDENTS
  - Females ( ~40%)
  - Males ( ~60%)







# BMI PROGRAM MISSION/VISION/GOAL

- › **OVERARCHING GOAL:** to increase the enrollment and success in Science, Technology, Engineering, and Mathematics (STEM) of African-American and Hispanic males at the New York City College of Technology
- › **MISSION:** to develop strong, sustainable interventions that promote access and success of African-American and Hispanic males in STEM.
- › **VISION:** to aid CITY TECH in becoming a model institution that values and fosters accessible, high quality student support programs for African-American and Hispanic males in STEM.
- › **GOAL:** to increase the quantity of African-American and Hispanic males who pursue degrees (undergraduate and graduate) in the STEM disciplines.
- › **STANDARD:** 90 % of **ALL** programmatic activities are “Acad-centric” - centered on Academics

# MAIN COMPONENTS OF THE BMI'S STRUCTURED MENTORING PROGRAM

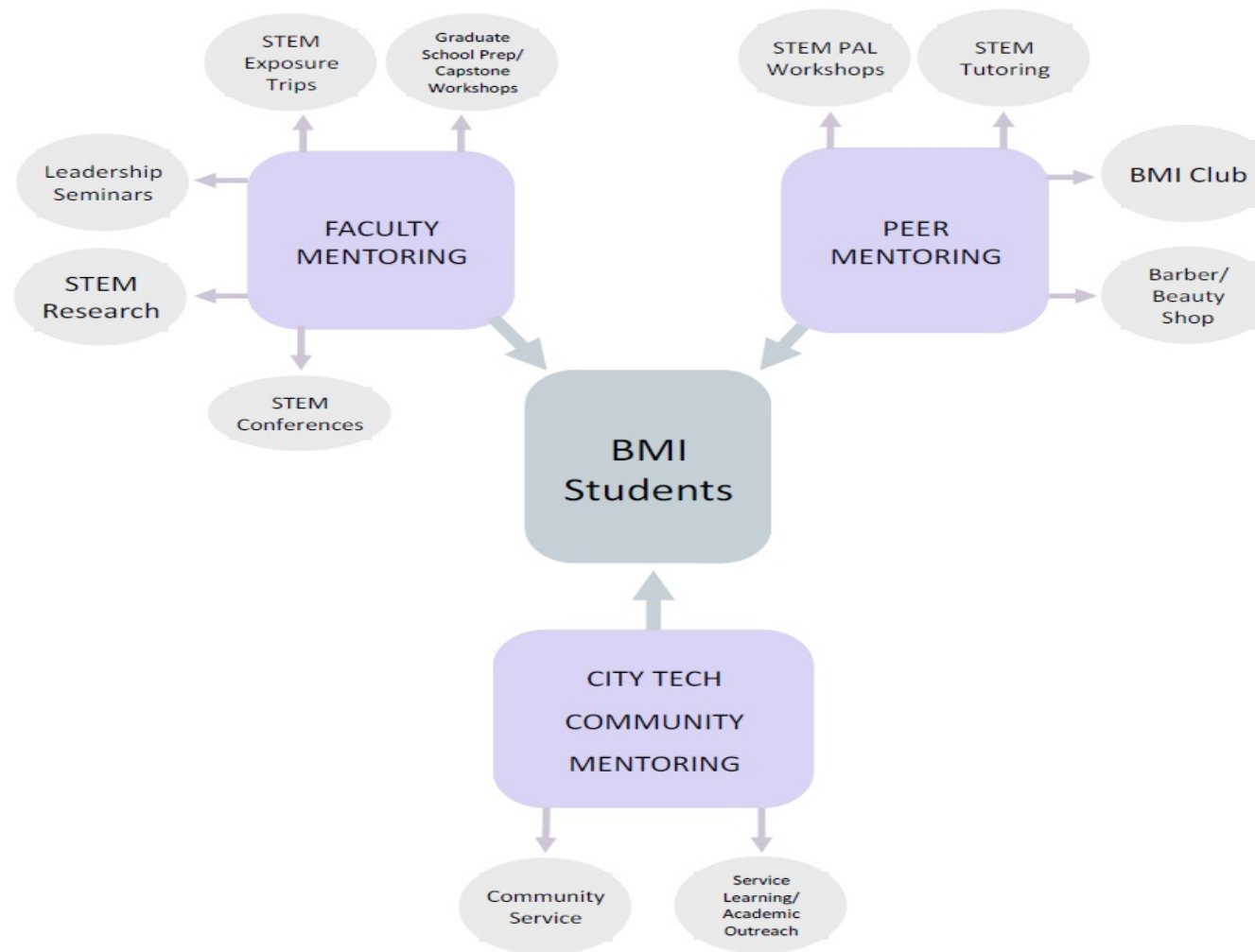


Figure 1: City Tech's STEM-Designated Black Male Initiative Structured Mentoring Model

# Some Noted Accomplishments of the City Tech BMI Program

- Over the past seventeen years, the program has produced 6 Valedictorians, 3 Salutatorians, 4 CUNY All-Stars, 1 Fulbright Scholar.
- Hosted the Thirteenth Annual CUNY Black Male Initiative Conference “Diversifying the STEM field: Exposing and Promoting Pathways”, Keynote Address by Dr. Sylvester James Gates; Friday, October 5, 2018
- BMI students conducted research at Stanford, Johns Hopkins, Rutgers, and Columbia Universities and at the Brookhaven National Laboratory
- BMI students conducted Earthwatch research in Mexico and in Canada
- In 2007, we were one of only nine national programs to be given a Model Replication Institution (MRI) designation by NASA, NSF, and IHEP



# Some Noted Accomplishments of the City Tech BMI Program

- Supports 50 BMI students annually with paid STEM research internships.
- Annually, BMI students make presentations at prestigious local and national conferences such as: MAA, AMS, AGU, ERN, LSAMP, EPP
- After working/studying at the NIH, 2 Former BMI Students are now were in Med School, and another student is now a medical doctor
- Two Former BMI students are now near the dissertation defense stage of the PhD Candidacies – one student at the University at Albany, and the other student is at Columbia University

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NSF Sponsored: Research Experience for Undergraduates in Satellite and Ground-Based Remote Sensing at NOAA-CREST: Expanded Opportunities\_2

June 10, 2021

# City Tech's NSF REU Program



Dr. Reginald Blake  
New York City College of Technology



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NATIONAL SCIENCE FOUNDATION  
**CESSRST REU SITE:**  
Research Experiences for  
Undergraduates in  
Satellite and Ground-  
Based Remote Sensing at  
NOAA-CREST: Expanded  
Opportunities\_2



- City University of New York (CUNY) undergraduate students conduct research in satellite and ground-based remote sensing

Research Areas: Multi-layered, multi-platformed applications of satellite and ground-based remote sensing to the cryosphere, biosphere, lithosphere, atmosphere, and hydrosphere.

- Faculty mentors are from the NOAA-CESSRST (CCNY) and from ReSESS (City Tech)





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REU 2011 SCHOLARS



REU 2012 SCHOLARS

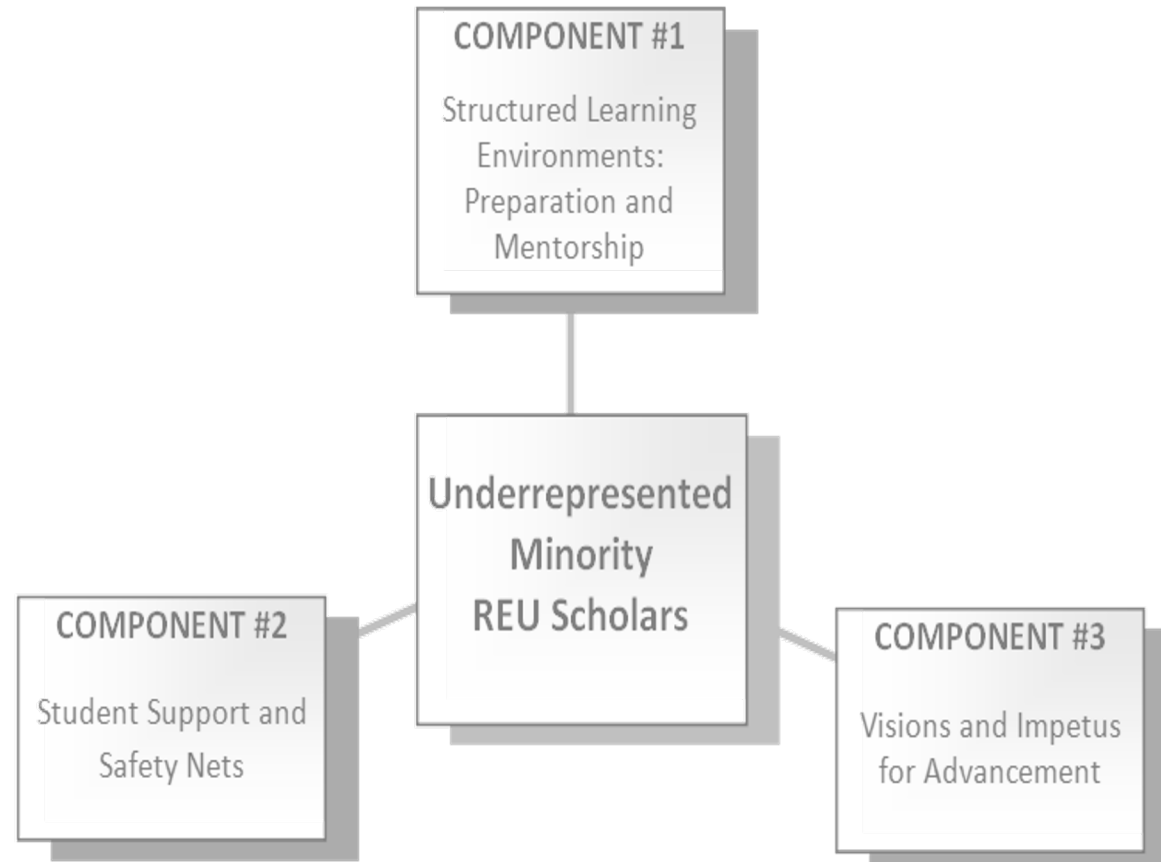


REU 2013 SCHOLARS

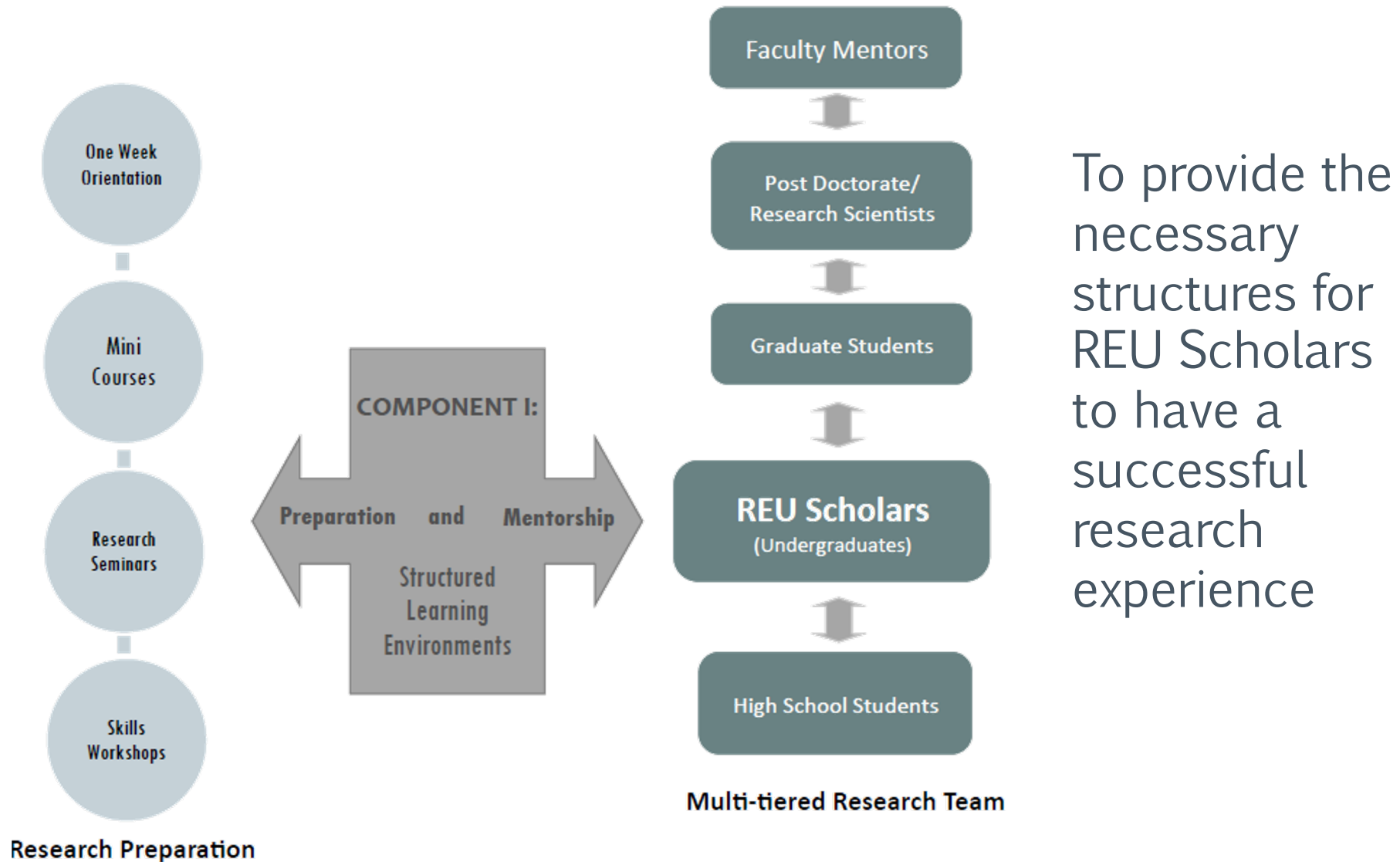
# CITY TECH'S NSF REU GOALS

- To create an enriched, transformative undergraduate research experience in satellite and ground-based remote sensing;
- To promote geoscience research among traditionally underrepresented minorities in STEM;
- To embolden and support undergraduates to pursue advanced degrees and careers in STEM;
- To stimulate interdisciplinary learning.

- **COMPONENT 1:**  
Structured Learning  
Environments:  
Preparation and  
Mentorship
- **COMPONENT 2:**  
Student Support  
and Safety Nets
- **COMPONENT 3:**  
Visions and Impetus  
for Advancement



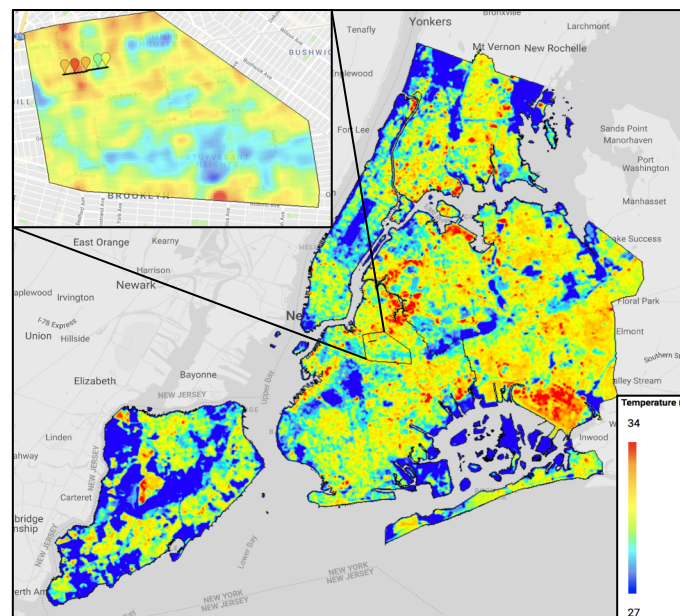
# Structured Learning Environments: Preparation and Mentorship







# Service-Learning Research Activities: Little Brothers Summer Camp in Brooklyn, NY



National Science Foundation  
Improving Undergraduate STEM Education

Dr. Reggie Blake  
Physics Department/Provost Office  
New York City College of Technology, CUNY



# City Tech STEM Majors

Applied Mathematics

Computer Science

Electrical Engineering Technology

Mechanical Engineering  
Technology

Computer Systems Technology

Construction Management and

Civil Engineering Technology

# GEOSCIENCE WORKFORCE PROGRAM GOALS

- (1) Create pathways for non-geoscience STEM majors to pursue geoscience degrees and careers
- (2) Provide hands-on geoscience training
- (3) Engage students in fundamental remote sensing/geoscience research experiences
- (4) Integrate authentic geoscience research experiences into the curriculum of an extant geoscience course





# Geoscience Workforce Skills Training and Enrichment

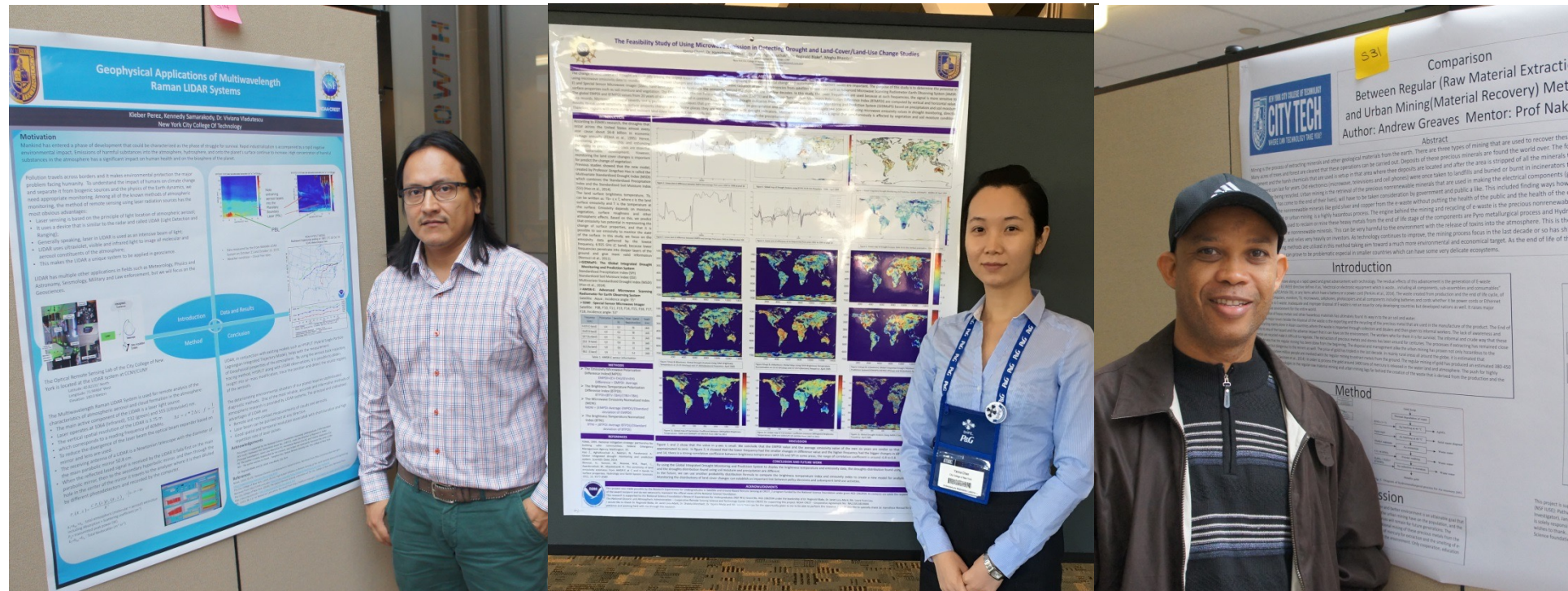
## WINTER SEMESTER



“I enjoy the additional training and skills”

# Internship I: Geoscience Research Projects

# SPRING SEMESTER



“I liked that I was able to have a better idea of how my major in Computer Information Systems can be used in the geoscience workforce.”



# Internship II: Federal Agencies and Private Industries

## SUMMER SEMESTER



# LOCAL PARTNERSHIPS

- Nine-week summer geoscience internship
- Geoscience workforce networking sessions
- Geoscience exposure trips
- Engagement with scientists from diversity of ethnic cultures





# Local Partnerships



US Environmental Protection Agency



NYC Department of Environmental Protection  
Newtown Creek Treatment Plant



US Environmental Protection Agency

# Corner-Stone, Guiding Strategies – What Works

- *Culturally Competent Peer-to-Peer Mentoring*
- *Socio-emotional Programing*
- *Diversity Recruitment*
- *Academic Enhancements*

# Corner-Stone, Guiding Strategies – What Works

- › At the department and university levels, more diversity fellowships, scholarships, and internships are needed to attract and to retain Black SEM students.
- › More Partnerships (and more equitable relationships) between minority-serving institutions and R1 universities are needed.
- › More MSI – Industry Partnerships are needed.
- › More MSI – Professional Organization Partnerships are needed
- › Paradigm shift – create and reward altruistic scholarly activities

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*Thank You!*