

# **SUNY-Industry Conference and Showcase: Science and Engineering for Social Good**



NATIONAL CENTER FOR  
SCIENCE & CIVIC ENGAGEMENT



**Stony Brook  
University**



The State University  
of New York

## **June 3-5, 2018**

# **Stony Brook University**



# Acknowledgements

The organizers of the SUNY-Industry Conference and Showcase: Science and Engineering for Social Good would like to acknowledge the following organizations and departments for their support of the conference and of NCSCE:

## **Stony Brook University**

Office of the President  
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## **The State University of New York**

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Office of Undergraduate and STEM Education  
Office of Applied Learning  
Office of Diversity, Equity & Inclusion

## **SUNY Research Foundation**

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## **Others**

Louis Stokes Alliance for Minority Participation Programs (LSAMP)  
SUNY LSAMP  
Soter Technologies

# SUNY-Industry Conference and Showcase Schedule at a Glance

## Sunday, June 3, 2018

<b>Time</b>	<b>Event</b>	<b>Location</b>
12:00 - 2:00 PM	<b>SUNY-Industry Conference and Showcase Check-in</b>	Wang Center Main Lobby
2:00 - 4:00 PM	<b>SUNY-Industry Opening and Plenary Session I</b>	Wang Center Lecture Hall 2
4:00 - 4:30 PM	<b>Networking Break</b>	Wang Center
4:30 - 6:00 PM	<b>Talk Block I</b>	Wang Center Classrooms
6:30 - 8:00 PM	<b>VIP Reception (by invitation only)</b>	Sunwood Events Center

## Monday, June 4, 2018

8:00 - 9:00 AM	<b>Breakfast</b>	Wang Center Theater Lobby
9:00 - 10:30 AM	<b>Plenary Session II</b>	Wang Center Lecture Hall 2
10:30 AM - 12:00 PM	<b>Talk Block II</b>	Wang Center Classrooms
12:00 - 1:30 PM	<b>Lunch</b>	Wang Center Theater Lobby
1:30 - 2:30 PM	<b>Plenary Session III</b>	Wang Center Lecture Hall 2
2:30 - 4:00 PM	<b>Poster Session</b>	Wang Center Theater Lobby
4:00 - 5:00 PM	<b>Plenary Session IV</b>	Wang Center Lecture Hall 2
5:00 - 7:00 PM	<b>Reception and Organizational Showcase</b>	Wang Center Zodiac Lobby

## Tuesday, June 5, 2018

8:00 - 9:00 AM	<b>Breakfast</b>	Wang Center Theater Lobby
9:00 - 10:00 AM	<b>Plenary Session V</b>	Wang Center Lecture Hall 2
10:00 - 11:30 AM	<b>Talk Block III</b>	Wang Center Classrooms
11:30 AM - 12:00 PM	<b>Networking Break</b>	Wang Center
12:00 - 1:30 PM	<b>Lunch</b>	Wang Center Theater Lobby
1:30 PM - 2:30 PM	<b>Plenary Session VI</b>	Wang Center Lecture Hall 2
2:30 PM - 3:30 PM	<b>Closing Session</b>	Wang Center Lecture Hall 2

# Science and Engineering for Social Good Talk Blocks at a Glance

## Sunday, June 3, 2018

### Talk Block I: 4:30 - 6:00 PM

Start Time	Lecture Hall 1	Lecture Hall 2	Chapel	Room 201
4:30 PM	Benevolent Computing	Barriers and Bridges to STEM Engagement among Underrepresented Students.	Is HIT a Hit? The Impact of Health Information Technology on Inpatient Hospital Outcomes	Interdisciplinary Capstone Courses in Stony Brook University's Sustainability Studies Program
5:00 PM	Will You Befriend Racially Different Strangers on Facebook?	Engineering Education in Context: Risk, Disaster, and the Conscientious Engineer	Addressing Unmet Demand for Community Based Services for New York State's Aging Population ...in other words "The Good, the Bad, the Ugly, and then there's California"	CELT: Creating a Community of Excellence in Learning & Teaching
5:30 PM	Make America Exceptional Again- Building Human Capacity to Transform the Science, Technological and Innovation Workforce	Inside and Outside Classroom Initiatives Fostering Student Engagement, Recruitment and Retention in STEM: Learning Communities and Research Opportunities Offered by the Department of Biological Sciences at Kingsborough Community College	Environmental Intelligence for a Safer World	Fun and Hands-on Innovative Technology for Instruction in Biomedical Engineering and other STEM courses

# Monday, June 4, 2018

## Talk Block II: 10:30 AM - 12:00 PM

Start Time	Lecture Hall 1	Lecture Hall 2	Chapel	Room 201
10:30 AM	Safe Nuclear Energy for 10 Billion	Western Alliance to Expand Student Opportunities - Mentoring Students in Social Entrepreneurship	ICT Utilization and Emergent Political Phenomena	Stony Brook University SPIR and VPED Partnerships with Industry
11:00 AM	Assessing the Technological and Economic Feasibility of Climate Mitigation Policies in Developing Regions	Engineering for All: Introducing Middle School Students to Engineering as a Potential Social Good	When Cell Phones Become Problematic: A Cross-Country and Cross-Institution Comparison of Technology Use between US and S. Korean College Students	Entrepreneurship at Stony Brook University
11:30 AM	Data and Model Driven Energy Policy for a Better Environment	The Importance of Utilizing Student Leaders in Program Development and Implementation	Secondary School Students and Their Mobile Devices: A Case Study from Indonesia	SUNY LSAMP: A Model for Broadening Participation in STEM

# Tuesday, June 5, 2018

## Talk Block III: 10:00 AM - 11:30 AM

Start Time	Lecture Hall 1	Lecture Hall 2	Chapel	Room 201
10:00 AM	Efforts to enhance Faculty Diversity and Inclusion	Undergraduate Research in Applied Math Using Industry-Supplied Problems	Disparities in Underrepresented Minority Evolution Acceptance: Implications for Diversifying the Biological Sciences	The Use of Ultrasound in Science and Engineering for Social Good
10:30 AM	Experiential Learning "The Process"....	Custom Landfill Gas Modeling at a Multiple Phase Landfill	Graduate Programming to Develop Leadership for Broadening Participation in Science, Technology, Engineering and Mathematics	
11:00 AM	Teaching Community Engagement to Engineers	Increasing Interest in STEM by Underrepresented Groups through Packaging Research	Strategic Diversity Planning for STEM Alliances	

**SUNDAY, JUNE 3, 2018**

**12:00 - 2:00 P.M.**

**SUNY-INDUSTRY CONFERENCE AND SHOWCASE CHECK-IN**

*Wang Center Main Lobby*

Please meet us in the lobby of the Wang Center to formally check in for the meeting and receive your program book and name tag.

**2:00 - 4:00 P.M.**

**SUNY-INDUSTRY OPENING AND PLENARY SESSION I**

*Wang Center Lecture Hall 2*

### **Introduction and Moderator**

David Ferguson

Distinguished Service Professor, Technology and Society, and Provost's Scholar

*Stony Brook University*

### **President's Welcome to Stony Brook University**

Samuel Stanley, Jr.

President

*Stony Brook University*

### **About the National Center for Science and Civic Engagement**

Eliza Reilly

Executive Director

*National Center for Science and Civic Engagement*

### **New York State Energy Issues and the Important Role for College/University-Industry-Government Collaboration**

Robert Catell

Chairman, Advanced Energy Research and Technology Center

*Stony Brook University*

### **Plenary Address: The Power of SUNY to Achieve the Sustainable Development Goals**

Peter Small

Founding Director of the Global Health Institute

*Stony Brook University*

In the past decades the world has achieved unprecedented improvements in human health and wellbeing. However, we now live in a complex and interdependent world that poses new and seemingly intractable challenges to us and the planet we inhabit. Fortunately, 194 countries have joined in a collective call to action in the form of the Sustainable Development Goals. Using the example of health, this talk will discuss the power of academia, in partnership with industry and governments, to achieve these important goals. Specifically using recent examples from the fight against tuberculosis to show how such partnerships can discover new scientific insights, develop them into innovative lifesaving technology and deliver them to those most in need. How the individuals that comprise the SUNY system respond to the global spread of digital technology will play a decisive role in ensuring a promising and equitable future.

**4:00 - 4:30 P.M.**

**NETWORKING BREAK**

*Wang Center Theater Lobby*

**4:30 - 6:00 P.M.**

*Wang Center Classrooms*

**TALK BLOCK I**

**4:30 - 4:50 P.M.**

*Chapel*

**Is HIT a Hit? The Impact of Health Information Technology on Inpatient Hospital Outcomes**

Debra Dwyer  
Ryan M. McKenna  
John Rizzo  
*Stony Brook University*

In an effort to eliminate inefficiencies in the US health care sector, policymakers have made a concerted effort to encourage hospitals and physicians to adopt health information technology (HIT) systems. Using a unique dataset on health information technology adoption and health outcomes in New York State, we conduct a hospital-level analysis identifying the impact of adopting HIT on inpatient outcomes (rates of adverse drug events and severity-adjusted mortality). Unlike previous studies, the patient population is not restricted to Medicare patients, but covers all ages and insurance types. After controlling for unobserved hospital quality and endogenous HIT adoption, our results suggest that a hospital's severity-adjusted mortality decreases by 0.3 percentage points. When restricted to the Medicare patients, we found HIT adoption lowers a hospital's severity-adjusted mortality rate by 0.5 percentage points. We found HIT to have no significant effect on the rate of ADEs.

**4:30 - 4:50 P.M.**

*Lecture Hall 1*

**Benevolent Computing**

Tony Scarlatos  
*Stony Brook University*

Case studies of undergraduate research and software development working with Long Island non-profits over the past five years will be presented; with the aim of exploring experiential learning, team dynamics, and technology assessment. Lessons learned in managing client and stakeholder relationships will also be presented.

For more information, see: <http://www.stonybrook.edu/magazine/2018-winter/computing-for-social-good>

**4:30 - 4:50 P.M.**

*Lecture Hall 2*

**Barriers and Bridges to STEM Engagement among Underrepresented Students**

Sheri Clark  
Sheri Levy  
Bonita London  
Nina Maung-Gaona  
*Stony Brook University*

Data from two longitudinal research studies explore how perceptions or cues of threat at the institutional level (e.g., from one's STEM department) may impact psychosocial processes that ultimately undermine underrepresented students' engagement in STEM domains. We examine how key psychosocial constructs of STEM identity, growth mindset beliefs, and perceptions of bias impact students' confidence, self-efficacy, belonging, and expected persistence in STEM domains during undergraduate and graduate education. We discuss institutional climate as a critical point of intervention to promote sustained engagement of underrepresented students.

**4:30 - 4:50 P.M.**

**Interdisciplinary Capstone Courses in Stony Brook University's Sustainability Studies Program**

*Room 201*

Kate Aubrecht  
*Stony Brook University*

The Sustainability Studies Program at Stony Brook University offers two team-taught capstone courses. One is place-based and focuses on the Long Island Pine Barrens. The other has a focus that changes depending on the expertise and interests of the faculty involved. The students enrolled in these courses represent the breadth of majors within Sustainability Studies, which spans natural science, social science, and humanities. These capstone courses have a phase of instructor-delivered content and a project phase. In the project phase, students work in heterogeneous (by major) teams. This presentation will give an overview of course themes, student projects, and the integration of science with other disciplines to address challenges of sustainability.

**5:00 - 5:20 P.M.**

**Addressing Unmet Demand for Community Based Services for New York State's Aging Population ...in other words "The Good, the Bad, the Ugly, and then there's California"**

*Chapel*

Ana Topolovec  
*Stony Brook University*

As health care costs rise and as the population ages, new strategies must be introduced to accommodate eldercare. The current system provides block grant funding through the federal government that is distributed for use by the individual states. These funds, however, target skilled nursing facilities (nursing homes) and therefore limit funding opportunities for community based programs and aging in place healthcare initiatives.

In evaluating what the states do with the funding, several models have been observed, affectionately known as "The Good, the Bad, the Ugly, and then there's California." This session will be briefly presenting "The Ugly," better known as New York State.

Given that an overwhelming majority of the population wishes to age in place, and given that a large portion of the care given at home is with the use of informal caregivers (i.e. family or friends), it begs the question...what community support options are available for both the care recipient as well as for the caregiver, and can we become "the Good," or at least California?

**5:00 - 5:20 P.M.**

**Will You Befriend Racially Different Strangers on Facebook?**

*Lecture Hall 1*

Firman Manda Firmansyah  
*Stony Brook University*

Previous research suggests that one out of three Facebook users confirmed friend requests from strangers. This decision may end up with both negative and positive outcomes. Nevertheless, considering that users may receive even greater benefits by befriending racially different strangers, i.e. benefits of diversity, this research attempts to identify under what conditions users are willing to confirm a friend request from racially different strangers. This research explores the relationship between prejudice, allophilia, perceived homophily, and privacy concern in predicting users' attitude to confirm the friend request. The results may apply to other settings.

**5:00 - 5:20 P.M.**

**Engineering Education in Context: Risk, Disaster, and the Conscientious Engineer**

*Lecture Hall 2*

Gary Halada  
*Stony Brook University*

This talk will focus on how risk assessment, ethics and value sensitive engineering are integrated in an online undergraduate course, "Learning from Engineering Disaster," developed and taught by the presenter. Design of the course is discussed, as well as its impact on learning outcomes and how the course concept fits within the broader goals of engineering in context and the role of narrative in undergraduate engineering education.

**5:00 - 5:20 P.M.**

**CELT: Creating a Community of Excellence in Learning & Teaching**

*Room 201*

Kimberly Bell  
*Stony Brook University Center for Excellence in Learning & Teaching*

Teaching, Learning, and Technology at Stony Brook University is now the Center for Excellence in Learning and Teaching. CELT is comprised of several divisions working together towards a shared vision to continuously improve teaching and learning by supporting experimentation, innovation, and evidence-based practices on campus and far beyond. This talk will provide an overview of our Center and how we will achieve our goals to engage faculty and students to catalyze community, creativity, experimentation and innovation, to define and promote evidence-based teaching practices and learning strategies, and to design and implement learning spaces that facilitate faculty-student engagement.

**5:30 - 5:50 P.M.**

**Environmental Intelligence for a Safer World**

*Chapel*

Derek Peterson  
*Soter Technologies*

We will look at various sensor technology and social engineering to combat security threats.

**5:30 - 5:50 P.M.**

**Fun and Hands-on Innovative Technology for Instruction in Biomedical Engineering and other STEM courses**

*Room 201*

Ete Chan  
*Stony Brook University*

Learning can be made fun and better with innovative instructional technology in Biomedical Engineering or other STEM courses. Hands-on learning is also possible even in online course. This presentation will highlight a few projects sponsored by various Stony Brook University and SUNY grants.

**5:30 - 5:50 P.M.**

**Make America Exceptional Again- Building Human Capacity to Transform the Science, Technological and Innovation Workforce**

*Lecture Hall 1*

Jonelle Bradshaw de Hernandez  
*Stony Brook University*

"New frontiers of the mind are before us, and if they are pioneered with the same vision, boldness, and drive with which we have waged this war we can create a fuller and more fruitful employment and a fuller and more fruitful life."

-Franklin D. Roosevelt, November 17, 1944.

Long are the days since Vannevar Bush, former Director of the Office of Scientific Research and Development for the United States, answered President Roosevelt's letter to him regarding utilizing scientific discoveries through war to move our society forward. This presentation will explore these same issues through the lense of a technological and innovation revolution in the United States. The same question holds firm- how do we utilize scientific inventions to improve the grand challenges that society is facing? This presentation will look at the vector of human capacity and how to expand its magnitude to direct US efforts to improve our country and world.

(United States Printing Office Washington, 1945: retrieved from <https://www.nsf.gov/od/lpa/nsf50/vbush1945.htm>)

**5:30 - 5:50 P.M.**

**Inside and Outside Classroom Initiatives Fostering Student Engagement, Recruitment and Retention in STEM: Learning Communities and Research Opportunities Offered by the Department of Biological Sciences at Kingsborough Community College**

*Lecture Hall 2*

Christina Colon  
Emral Devany  
Craig Hinkley  
Anna Rozenboym  
*Kingsborough Community College*

Several initiatives at Kingsborough Community College (KBCC) attempt to emphasize importance of civic engagement opportunities offered inside and outside of classroom to both students currently enrolled at KBCC as well as to prospective students. Such opportunities vary from college-wide events promoting civic responsibility and advocacy to courses with civic engagement component. The department of Biological Sciences spearheaded numerous programs strengthening science education in the context of civic responsibility and SENCER ideals. This presentation will highlight inside classroom activities and curricular design that aims at providing support services and increasing retention of underrepresented minority students. An overview and examples of student-faculty research collaborations supported by programs, funded by various state and national agencies offered through the department will be provided. Further, preliminary data analysis and results pertaining to retention will be discussed.

**6:30 - 9:30 P.M.**

**VIP RECEPTION AND DINNER (BY INVITATION ONLY)**

*Sunwood Events Center*

A shuttle for participants in the VIP reception will leave the Wang Center at 6:15 p.m., stop by the Hilton Garden Inn, then depart from Sunwood to return to both the Hilton Garden Inn and the Wang Center at 9:30 p.m.

**MONDAY, JUNE 4, 2018**

**8:00 - 9:00 A.M.**

**BREAKFAST**

*Wang Center Theater Lobby*

**9:00 - 10:30 A.M.**

**PLENARY SESSION II: PANEL ON FUNDING OPPORTUNITIES AT NSF AND NIH**

*Wang Center Lecture Hall 2*

This panel will feature personnel from the National Science Foundation and the National Institutes of Health as they discuss current priorities at each and how they translate into opportunities for funding.

**Introduction and Moderator**

Eliza Reilly  
Executive Director  
*National Center for Science and Civic Engagement*

**Panel Members**

Myles Boylan  
Program Director, Division of Undergraduate Education (DUE)  
*National Science Foundation*

Martha James  
Program Officer, Directorate for Education and Human Resources, Division of Human Resource Development  
*National Science Foundation*

Andre Marshall  
Program Director, Industry University Cooperative Research Centers Program (IUCRC)  
*National Science Foundation*

Ethel Rubin  
Entrepreneur-in-Residence, Office of Extramural Research  
*National Institutes of Health*

**10:30 A.M. - 12:00 P.M.**

**TALK BLOCK II**

*Wang Center Classrooms*

**10:30 - 10:50 A.M.**

**ICT Utilization and Emergent Political Phenomena**

*Chapel*

Martin Smyth  
*Stony Brook University*

This presentation will describe ongoing work on the role of information and communication technology utilization and emergent mass-mobilization political phenomena.

**10:30 - 10:50 A.M.**

**Safe Nuclear Energy for 10 Billion**

*Lecture Hall 1*

Edward Friedman  
*Stevens Institute of Technology*

Overview of the TerraPower reactor being developed by Bill Gates in collaboration with China's nuclear agency, that breeds and burns Plutonium. Using liquid sodium, it is safe, has low levels of waste and requires little maintenance during a 40 year run cycle. The design uses supercomputer calculations to position the fuel rods.

**10:30 - 10:50 A.M.**

**Western Alliance to Expand Student Opportunities - Mentoring Students in Social Entrepreneurship**

*Lecture Hall 2*

Antonio Garcia  
*Arizona State University*

The NSF sponsored LSAMP program, the Western Alliance to Expand Student Opportunities, relies on close mentoring by faculty and advanced graduate students to involve undergraduate underrepresented racial and/or ethnic minority students in research. Increasingly, the mentoring activities have included entrepreneurship for social good in areas such as alternative energy, sustainability of the built environment, biotechnology for low and middle-income countries, and informatics. This presentation describes our partnering with several initiatives that align with our LSAMP goals and case studies of projects from the perspectives of our students and faculty.

**10:30 - 10:50 A.M.**

**Stony Brook University SPIR and VPED Partnerships with Industry**

*Room 201*

Lisa Chichura  
*VPED*

This talk will describe the Economic Development Programs here at Stony Brook that support the SUNY-Industry Partnerships.

11:00 - 11:20 A.M.

**When Cell Phones Become Problematic: A Cross-Country and Cross-Institution Comparison of Technology Use between US and S. Korean College Students**

*Chapel*

Maria Sanmartin  
*Hofstra University*

Rachel Kreier  
*St. Joseph's College*

Debra Sabatini Dwyer  
*Stony Brook University*

Suzana Brown  
Mark Douglas Whitaker  
*SUNY Korea*

The literature on pathological and problematic use of the Internet and cell phones is growing rapidly and worldwide, with a focus on the prevalence of problematic use and the consequences of that use. Rapid innovation, with so much positive potential, has hit the world unexpectedly fast with impact that has yet to be explored. Much of the literature uses experimental design on convenience samples from around the world, with a bulk of the work focusing on Asian countries. What is clear is that we are facing a world that is about to be inherited by young people for whom technology is a part of the fabric of their being. Yet we do not understand the impact, and how it might vary across countries with diverse cultures and institutions. In order to understand the factors that may place individuals at risk for dependence or unhealthy technology use, we have surveyed college students (N=1300) in South Korea and in the United States. We examine within and across country/institution variation to draw conclusions about factors that may place individuals at risk for dependence or unhealthy technology use. We also explore the social context influencing variations in personal mobile phone use. In doing so, we inform policies aimed at the improvement of social welfare given rapid innovation, without the unintended consequences.

11:00 - 11:20 A.M.

**Assessing the Technological and Economic Feasibility of Climate Mitigation Policies in Developing Regions**

*Lecture Hall 1*

Raphael Apeaning  
*Stony Brook University*

There is increasing evidence that the adverse effects of anthropogenic climate change is disproportionately borne by poor and vulnerable regions of the world. The hazards of climate change are expected to erode recent development and poverty reduction gains in the developing world, through channels such as livelihoods, consumption, assets, health, and productivity. Mitigating these potential damages and risks will require the widest possible cooperation by all countries to address this issue in a cost-effective manner.

Nonetheless, achieving the proposed climate stabilization pathways poses many political and economic challenges, especially among developing economies. These transitions would entail a massive and premature retirement of fossil-based technology stocks. The stranded assets and cost associated with phasing out these technologies have the potential to undermine short-term economic growth in developing regions. In addition, studies have argued that the distributional effect of national climate mitigation policies have the potential to exacerbate poverty in developing regions. On the other hand, mitigation policies provide an array of co-benefits related to economic development, human health, water and energy security, land use and many more. Quantifying and incorporating these co-benefits into the mitigation discourse offers a lens to lower the economic risk of policies inherent to developing economies. In addition, articulating the co-benefits creates a wider space for collaboration and facilitates raising finance.

The overarching goal of this research is to assess the salient technology and economic pathways, critical for developing nations to contribute a 2.0 °C climate stabilization pathways. Primarily, this study will focus on elucidating the techno-economic pathways by which developing economies can contribute to climate stabilization without compromising their legitimate aspirations for development.

**11:00 - 11:20 A.M.**

**Engineering for All: Introducing Middle School Students to Engineering as a Potential Social Good**

*Lecture Hall 2*

Michael Hacker  
*Hofstra University*

The Engineering for All (EFA) project, funded by the NSF (grant # 1316601), created prototypical technology/engineering curriculum units for middle school teachers and students that were tested nationally by 22 teachers and 755 students from diverse ethnic and racial backgrounds and geographic locations nationwide to assess feasibility of implementation. The units invite students to develop design solutions to two important societal challenges: Food scarcity and water scarcity. Two six-week units were developed: Vertical Farming: Fresh Food for Cities, and H<sub>2</sub>O=LIFE. Lead developers of the Next Generation Science Standards (NGSS) and the Standards for Technological Literacy (STL) served as co-PIs, so curriculum units align well with these standards.

Unique features of EFA include portraying engineering as a route to sustainability and social equity; revisiting unifying engineering themes (design, systems, modeling, resources, and human values) in different contexts; enhancing engineering thinking; and engaging all students, not just those predisposed to engineering careers, in authentic, integrated STEM learning. The intent is to promote the potential of engineering as social good, open students' eyes to the role engineers play in addressing global and community-based issues, and instill the confidence that with continued STEM study, they can make a difference in the world.

**11:00 - 11:20 A.M.**

**Entrepreneurship at Stony Brook University**

*Room 201*

Ann-Marie Scheidt  
*Stony Brook University*

Talk will focus on entrepreneurship at Stony Brook University, with a description of the programs available to support these activities, namely I-Corps.

**11:30 - 11:50 A.M.**

**Secondary School Students and Their Mobile Devices: A case study from Indonesia**

*Chapel*

Ahmad Pratama  
*Stony Brook University*

This study examines mobile device ownership and uses among middle school and high school students. As part of a larger study, this study aims to see the pattern of ownership among the students and to check if there are significant differences between students from different sex, age, grade, level of education, socioeconomic status, or location in terms of what devices they own and how they use them. This study used primary data from a self-reported survey collected in the first quarter of 2016. A total of 1,157 students from four secondary schools in Indonesia, each represents different education level and location, participated in this study.

Logistic regression models show how different factors influence the ownership of different devices and how smartphone being the most universal device to own. The study also reveals some gender-based preference in some devices ownership and how attitudes toward ICT and socioeconomic status are the two most important predictors to the ownership of these devices. As students tend to own more than one device at the same time, some major bundles are identified and the same predictors are used to estimate the ownership of these bundles.

In terms of how these students use their mobile device, this study shows that almost half of them spent 5 hours or more per day on their mobile devices. Of three categories of mobile apps provided, social media apps are the most frequently used by far, followed by educational apps, and then, mobile games as the least commonly used of them all. Multiple correspondence analysis is used to visualize the relationship between time spent on mobile devices with apps use in those three categories. Finally, the same predictors are also used to estimate the likelihood of spending 5 hours or more per day on mobile devices as well as being a regular or a heavy user of social media, games, and educational apps, respectively.

The findings in this research provide some firsthand insights into device ownership and use among secondary school students and it can serve as the foundation for a larger research agenda in quest of optimizing the use of mobile device among students, particularly the one that can improve their academic achievement.

**11:30 - 11:50 A.M.**

### **Data and Model Driven Energy Policy for a Better Environment**

*Lecture Hall 1*

Gang He

*Stony Brook University*

The increasing availability of big data and growing capacity of modeling provide new opportunities to address the global environmental and climate challenges. The presenter will use two examples, indicators for low carbon eco-city, and modeling the technology pathway to decarbonize China's power sector, from his research to demonstrate the use of data and model to facilitate evidence-based energy policy analysis that helps policymakers to have the right metrics and tools for better policy. The presenter will share the findings and reflect the advantages and limits of data and modeling, and discuss strategies to make use of data and model for social good.

**11:30 - 11:50 A.M.**

### **The Importance of Utilizing Student Leaders in Program Development and Implementation**

*Lecture Hall 2*

Christine Veloso

*Stony Brook University*

STEP and CSTEP are tasked with engaging students through the provision of activities and programs, as well as support systems, to facilitate their membership's academic, professional and personal success. Developing innovative ways to do this can be a challenge with limited resources, staffing and funds. However, a commodity that may go untapped by program Administrators is the students themselves.

This presentation will discuss two internships for undergraduates that were developed with the help of student leaders to provide experiential learning opportunities for their fellow program members.

In addition to discussing the way CSTEP students are engaged through Student Advisory Board, Teacher Assistant and Mentoring positions, two internship opportunities will be featured:

1. SB HOME CSTEP Student Interpreter Internship
2. CSTEP/CentriSeed Internship

**11:30 - 11:50 A.M.**

**SUNY LSAMP: A Model for Broadening Participation in STEM**

*Room 201*

Candice Foley, Suffolk County Community College  
Shanise Kent, University at Albany  
Stacie Nunes, SUNY New Paltz

The SUNY LSAMP was formed in 1996 and is a collaboration of SUNY university centers, four year colleges, and community college working together to broaden participation in STEM within SUNY. Goals of the collaboration and some alliance-wide outcomes will be presented. Representatives from each of the three categories of institutions will share their perspectives on achieving goals for the SUNY LSAMP students.

**12:00 - 1:30 P.M.**

**LUNCH**

*Wang Center Theater Lobby*

**1:30 - 2:30 P.M.**

**PLENARY SESSION III**

*Wang Center Lecture Hall 2*

**Introduction and Moderator**

Eliza Reilly  
Executive Director  
*National Center for Science and Civic Engagement*

**Plenary Address: Making the Choice to Connect**

Lydia Franco-Hodges  
Curriculum Designer  
*Alda Center for Communicating Science*

The Alan Alda Center's Plenary is a highly interactive session during which participants learn to communicate more effectively about their work/science with people outside their field, including the general public, policy makers, the media, students, potential employers or funders, and prospective collaborators in other disciplines. Through discussion and practice, we will focus on fundamental skills - knowing your audience, connecting with your audience, and speaking clearly and conversationally about your work and why it matters. Participants will practice clarity in speaking to non-scientists about their work and may be actively engaged in improvisation exercises or explaining scientific material to lay people.

**Strategic Diversity Planning for STEM Alliances**

Stephen Cox  
*Drexel University*

The Greater Region Louis Stokes Alliance for Minority Participation (Philadelphia AMP), funded by the National Science Foundation and now in its twenty-fourth year of operation, represents a diverse alliance of public and private, 2- and 4-year, research and non-research, Historically Black Colleges and Universities (HBCUs) and majority institutions. The major goals of the current Philadelphia AMP Initiative are to intensify its on-going efforts to substantially increase the quantity and quality of African American, Hispanic or Latino, Native American, and Native Hawaiian or Pacific Islander students receiving baccalaureate degrees in science, technology, engineering, and mathematics (STEM), and subsequently, entering graduate school to attain doctoral degrees.

Through synergistic collaboration, the Philadelphia AMP, as a tri-state, nine institution consortium, has utilized its operational infrastructure to increase the capacity of its partner institutions to recruit, retain, and graduate more underrepresented minority STEM students by substantially expanding their capacities to attract, develop, and support STEM student talent. Historically, Philadelphia AMP has more than tripled its annual minority STEM B.S. degree rate of production which has risen from 201 degrees to 1,047 degrees as of 2017, and is providing direct services to over 3,100+ students on an annual basis.

This session will provide an overview of the following:

- An Alliance framework that allows partners to participate in the development and implementation of programs and institutional shifts to support increased STEM degree production for underrepresented minority students; and
- The integration of existing initiatives running parallel to the LSAMP framework.

**Custom Landfill Gas Modeling at a Multiple Phase Landfill**

Lori Clark  
*Stony Brook University*

Landfill gas is ranked as the third highest anthropogenic contributor to greenhouse gas emissions, it is a source of multiple air pollutants, and policies have placed it as a valuable source of renewable natural gas. As a high impact and valuable gas, improving the reliability of modeling its production is beneficial to multiple agents. Air quality regulators and greenhouse gas monitoring agencies require the use of landfill gas models for emissions reporting. The same models serve as a resource for planning costly gas collection and treatment systems and landfill gas to energy projects. Better informed reporting and planning require improved transparency and reliability among models, particularly at landfill sites where policies impact shifts in waste acceptance and phase closures (potentially impacting gas production). To address this, several factors were introduced to the commonly used US-EPA LandGEM model including: waste component material fractions, material specific decay rates and gas generating potential values, phase closures, and scaling factors. This study demonstrates the effects of applying customized approaches to modeling gas projections at a landfill where conditions change over time. Application of custom techniques reduced gas projections substantially. The use of site specific waste sort data compared to US-EPA estimates also affected gas estimates.

## **Experiential Learning "The Process" ....**

Carrie-Ann Miller  
*Stony Brook University*

Stony Brook University is committed to experiential learning and encourages students to engaging in either a service learning, research, or an internship opportunity. Experiential learning experiences empowers students and faculty while giving them an opportunity to learn together through real life experiences. These meaningful experiences reinforce the students' classroom knowledge and help them to learn to transfer knowledge and skills in different career and community settings. Valuable interpersonal and intrapersonal skills such as communication, leadership, conflict resolution, problem solving, and group work skills are develop and enhanced through experiential learning.

This workshop will give an overview of the process of developing the self-awareness and skills needed to seek and have a valuable experience outside of the classroom. The importance of having a growth mindset, knowing one's strengths, values and priorities will be discussed.

Two examples of students driven interdisciplinary global internships: Mosquitoes Be Gone and The Humanology Project will provide case studies and examples of how students can initiate and designed unique internships that incorporate different disciplines.

## **Benevolent Computing**

Tony Scarlatos  
*Stony Brook University*

Case studies of undergraduate research and software development working with Long Island non-profits over the past five years will be presented; with the aim of exploring experiential learning, team dynamics, and technology assessment. Lessons learned in managing client and stakeholder relationships will also be presented.

For more information, see: <http://www.stonybrook.edu/magazine/2018-winter/computing-for-social-good>

## **Increasing Interest in STEM by Underrepresented Groups through Packaging Research**

Kim Smith  
David Tonjes  
*Stony Brook University*

The results of an experiential learning project in the field of solid waste and resource management are presented, as these relate to material recovery, recycling and reuse. A project-based learning method was employed in a course titled "Packaging Research" which was part of the school's Collegiate Science and Technology Entry Program (CSTEP). The goal of this project was to introduce high school students in 9th and 10th grades, who met eligibility criteria coming from underrepresented households in New York State, to the concepts of scientific discovery. The students, who self-selected to enroll in the course, had mathematical and scientific study deficits. The focus of the six Saturday class sessions was on issues associated with the accuracy and precision of measurements, using weights of packaging and materials in a variety of household products. These products were similar to a prior report published 25 years ago by the Office of Technology Assessment (OTA, 1989).

## **ICT Utilization and Emergent Political Phenomena**

Martin Smyth  
*Stony Brook University*

This presentation will describe ongoing work on the role of information and communication technology utilization and emergent mass-mobilization political phenomena.

## **The Importance of Utilizing Student Leaders in Program Development and Implementation**

Christine Veloso  
*Stony Brook University*

STEP and CSTEP are tasked with engaging students through the provision of activities and programs, as well as support systems, to facilitate their membership's academic, professional and personal success. Developing innovative ways to do this can be a challenge with limited resources, staffing and funds. However, a commodity that may go untapped by program Administrators is the students themselves.

This presentation will discuss two internships for undergraduates that were developed with the help of student leaders to provide experiential learning opportunities for their fellow program members.

In addition to discussing the way CSTEP students are engaged through Student Advisory Board, Teacher Assistant and Mentoring positions, two internship opportunities will be featured:

1. SB HOME CSTEP Student Interpreter Internship
2. CSTEP/CentriSeed Internship

## **Undergraduate Research in Applied Math Using Industry-Supplied Problems**

Debbie Yuster  
*SUNY Maritime College*

Many students wonder why they must take math courses, and how the math they learn is used in the real world. Even math majors may believe their only career option is to teach. The PIC Math program (Preparation for Industrial Careers in Mathematical Sciences) aims to educate and prepare STEM majors for industrial careers using their quantitative skills. With funding and faculty training from PIC Math, an upper-division math elective was offered at SUNY Maritime College in Spring 2017. Students were divided into groups, each of which researched a problem of interest to a partner company, using math and computer programming.

The projects came from:

- A shipping company, who asked students to create a model that estimates their ships' toxic emissions
- A financial company that must check account holder names against a terrorist watch list, who asked students to evaluate the performance of their name-matching algorithm
- A digital forensics company, who asked students to analyze a method used to avoid computer network congestion

Topics to be discussed include securing funding for the course, finding partner companies and projects, and the course itself. No technical background required!

**4:00 - 5:00 P.M.**

**PLENARY SESSION IV**

*Wang Center Lecture Hall 2*

**Introduction and Moderator**

David Ferguson

Distinguished Service Professor, Technology and Society, and Provost's Scholar  
*Stony Brook University*

**Plenary Address: The VIP Consortium: Universities Engaging with the World through Large-scale, Long-term, Multidisciplinary Projects that Support Innovation**

Edward Coyle

Director of the Arbutus Center for the Integration of Research and Education  
*Georgia Institute of Technology*

In the Vertically Integrated Projects (VIP) Program, undergraduate students who join VIP teams earn academic credit for their participation in projects that assist faculty and their graduate students with innovative activities in their areas of interest, including civic engagement. The teams are: multidisciplinary – drawing students from every discipline on campus; vertically-integrated – maintaining a mix of sophomores through PhD students each semester; large-scale – the average team has 16 undergraduates, 1 to 4 graduate students, and 1 to 3 advisers; and, long-term – each undergraduate student may participate in a project for up to seven semesters and each graduate student may participate for the duration of their graduate career. The continuity, technical depth, and disciplinary breadth of these teams enable the completion of projects of significant benefit to researchers' activities and to the community at-large. Examples of VIP projects at Georgia Tech will be provided, emphasizing those related to local civic engagement, the UN Sustainability Goals, and the NAE's Grand Challenges. The VIP Consortium, which currently consists of 28 universities around the world, provides a unique forum for all VIP sites to collaborate with each other to improve the program and extend it to new disciplines in order to achieve systemic change.

**5:00 - 7:00 P.M.**

**RECEPTION AND ORGANIZATIONAL SHOWCASE**

*Wang Center Zodiac Lobby*

In addition to tonight's reception, we will have a various organizations doing work related to the conference will showcase their efforts.

**The IDC VIP Project at Georgia Tech: Localizing RF Sources in Large-scale Events**

*Georgia Institute of Technology*

This showcase describes the work of the Intelligent Digital Communications VIP team at Georgia Tech. The team includes undergraduates from three disciplines, several graduate students, and two research advisers. The goal of the team is to create, develop and deploy new systems for localizing RF sources in large-scale events like football games. The team has new research results in this area and has developed new RF sensor nodes to deploy in the football stadium at Georgia Tech. One of these nodes will be on display during the conference.

**The Stony Brook University Center for Inclusive Education**

*Stony Brook University*

The Center for Inclusive Education in The Graduate School at Stony Brook University works to recruit, retain, and graduate underrepresented minority and otherwise disadvantaged scholars by providing financial assistance, social support, and advocacy, with the goal of broadening participation of disadvantaged Americans in academia and the scientific workforce.

**Stony Brook University Programs: VPED, SPIR, MTRC, CIEES**

*Stony Brook University*

This showcase will describe various program at Stony Brook which partner with industry.

**TUESDAY, JUNE 5, 2018**

**8:00 - 9:00 A.M.**

**BREAKFAST**

*Wang Center Theater Lobby*

**9:00 - 10:00 A.M.**

**PLENARY SESSION V**

*Wang Center Lecture Hall 2*

**Introduction and Moderator**

David Ferguson

Distinguished Service Professor, Technology and Society, and Provost's Scholar  
*Stony Brook University*

**Plenary Address: SUNY Research and Innovation Transforms Lives**

Heather Hage

Vice President for Industry and External Affairs

*The Research Foundation for the State University of New York*

Heather Hage, The Research Foundation for the State University of New York's Vice President for Industry and External Affairs will discuss SUNY's systemwide research capacity, and describe how SUNY's engagement with industry partners through the Research Foundation is critical to translating academic research to societal impact.

**10:00 A.M. - 12:00 P.M. TALK BLOCK III**

*Wang Center Classrooms*

**10:00 - 10:20 A.M.**

**Disparities in Underrepresented Minority Evolution Acceptance: Implications for Diversifying the Biological Sciences**

*Chapel*

Ross Nehm

Gena Sbeglia

*Stony Brook University*

STEM fields are characterized by low diversity even though underrepresented minorities (URMs) enroll in STEM majors at the same rate as white students. In particular, the field of Ecology and Evolution (E&E) has one of the lowest proportions of URMs among all STEM fields. As gateway courses to the life sciences, introductory biology classes have the potential to engage a diverse audience in terms of race, gender, first-generation status, and academic preparedness. Therefore, introductory courses are valuable settings in which to study the factors contributing to the disproportionate attrition of URM students.

One hypothesis that has received considerable attention is that acceptance of evolution plays an important role in learning about evolution. Therefore, it is possible that a low acceptance of the central tenets of the discipline may explain the relatively poor persistence of URM students and ultimately, their disproportionately high rates of attrition. In this study, we aim to assess the relationship between URM status and evolutionary acceptance. Evolutionary acceptance was measured using the published Inventory of Student Evolution Acceptance (I-SEA), which assesses acceptance of evolution on three subscales: microevolution, macroevolution, and human evolution.

Pre- and post-course acceptance measures, along with student-specific data (race, gender, age, previous biology courses taken, reading skills, english as a first language) were collected pre-post-course for six semesters of an introductory biology course (N = 2132, average consent rate=74%). Rasch-transformed subscale scores (i.e. person scores for each subscale) were used as outcome variables in regressions. We compared three regression models for each subscale, each of which controlled for student variables and had varying interaction effects among race, gender, and time period (i.e. pre/post). Pre-course acceptance scores were generally high but increased significantly post-course for all subscales; these gains did not differ by race or gender. However, females had lower acceptance scores than males for all three subscales. Furthermore, Asian and URM students had lower acceptance scores than White students for all subscales. We report a measurable disparity in evolution acceptance by gender and race in our large population of undergraduate biology students. Because evolution is a central tenet of E&E, lower acceptance of evolution by females and URM students may contribute to URM attrition. Our work, the first to use validated instruments and Rasch-transformed scores to measure acceptance pre-post course in large samples, calls for two actions: First, application of interventions targeting acceptance in undergraduate biology courses; second, empirical studies examining the degree to which acceptance disparities impact URM attrition rates.

**10:00 - 10:20 A.M.**

### **Efforts to enhance Faculty Diversity and Inclusion**

*Lecture Hall 1*

Stella Tsirka  
*Stony Brook University*

**10:00 - 10:20 A.M.**

### **Undergraduate Research in Applied Math Using Industry-Supplied Problems**

*Lecture Hall 2*

Debbie Yuster  
*SUNY Maritime College*

Many students wonder why they must take math courses, and how the math they learn is used in the real world. Even math majors may believe their only career option is to teach. The PIC Math program (Preparation for Industrial Careers in Mathematical Sciences) aims to educate and prepare STEM majors for industrial careers using their quantitative skills. With funding and faculty training from PIC Math, an upper-division math elective was offered at SUNY Maritime College in Spring 2017. Students were divided into groups, each of which researched a problem of interest to a partner company, using math and computer programming.

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**10:30 - 10:50 A.M.**

**Graduate Programming to Develop Leadership for Broadening Participation in Science, Technology, Engineering and Mathematics**

*Chapel*

Molly Carnes  
Gail Coover  
Douglass Henderson  
*University of Wisconsin-Madison*

Increasing the diversity of the domestic workforce with advanced degree training in science, technology, engineering, and mathematics (STEM) is vital to the nation's security and global competitiveness. This presentation will describe a nationally recognized, faculty-led graduate diversity program in STEM (first directed by WiscAMP Co-PI Douglass Henderson) that has resulted in over 150 PhDs, 28 of whom are tenure-track faculty. The retention rates through graduate degree completion are 98% for engineering and 88% for the biology, life sciences and biomedical research, and health professions collectively. The program leverages fellowship funding through the graduate school and the Wisconsin Louis Stokes Alliance for Minority Participation Bridge to the Doctorate (WiscAMP-BD) in addition to faculty research and training grants to ensure 5 years of committed support for each student, all of whom are from ethnic/racial groups that are underrepresented in STEM.

The WiscAMP-BD curriculum is a collaboration with the Training, Education And Mentoring in Science (TEAM Science program, directed by WiscAMP Co-PI Molly Carnes). The curriculum is informed by robust social, behavioral and education theories and emphasizes the development of students' and faculty advisors' leadership to broaden participation in STEM. Information about specific program components and strategies for successful implementation will be emphasized.

**10:30 - 10:50 A.M.**

**Experiential Learning "The Process"....**

*Lecture Hall 1*

Carrie-Ann Miller  
*Stony Brook University*

Stony Brook University is committed to experiential learning and encourages students to engaging in either a service learning, research, or an internship opportunity. Experiential learning experiences empowers students and faculty while giving them an opportunity to learn together through real life experiences. These meaningful experiences reinforce the students' classroom knowledge and help them to learn to transfer knowledge and skills in different career and community settings. Valuable interpersonal and intrapersonal skills such as communication, leadership, conflict resolution, problem solving, and group work skills are develop and enhanced through experiential learning.

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Two examples of students driven interdisciplinary global internships: Mosquitoes Be Gone and The Humanology Project will provide case studies and examples of how students can initiate and designed unique internships that incorporate different disciplines.

**10:30 - 10:50 A.M.**

**Custom Landfill Gas Modeling at a Multiple Phase Landfill**

*Lecture Hall 2*

Lori Clark  
*Stony Brook University*

Landfill gas is ranked as the third highest anthropogenic contributor to greenhouse gas emissions, it is a source of multiple air pollutants, and policies have placed it as a valuable source of renewable natural gas. As a high impact and valuable gas, improving the reliability of modeling its production is beneficial to multiple agents. Air quality regulators and greenhouse gas monitoring agencies require the use of landfill gas models for emissions reporting. The same models serve as a resource for planning costly gas collection and treatment systems and landfill gas to energy projects. Better informed reporting and planning require improved transparency and reliability among models, particularly at landfill sites where policies impact shifts in waste acceptance and phase closures (potentially impacting gas production). To address this, several factors were introduced to the commonly used US-EPA LandGEM model including: waste component material fractions, material specific decay rates and gas generating potential values, phase closures, and scaling factors. This study demonstrates the effects of applying customized approaches to modeling gas projections at a landfill where conditions change over time. Application of custom techniques reduced gas projections substantially. The use of site specific waste sort data compared to US-EPA estimates also affected gas estimates.

**11:00 - 11:20 A.M.**

**Strategic Diversity Planning for STEM Alliances**

*Chapel*

Stephen Cox  
*Drexel University*

The Greater Region Louis Stokes Alliance for Minority Participation (Philadelphia AMP), funded by the National Science Foundation and now in its twenty-fourth year of operation, represents a diverse alliance of public and private, 2- and 4-year, research and non-research, Historically Black Colleges and Universities (HBCUs) and majority institutions. The major goals of the current Philadelphia AMP Initiative are to intensify its ongoing efforts to substantially increase the quantity and quality of African American, Hispanic or Latino, Native American, and Native Hawaiian or Pacific Islander students receiving baccalaureate degrees in science, technology, engineering, and mathematics (STEM), and subsequently, entering graduate school to attain doctoral degrees.

Through synergistic collaboration, the Philadelphia AMP, as a tri-state, nine institution consortium, has utilized its operational infrastructure to increase the capacity of its partner institutions to recruit, retain, and graduate more underrepresented minority STEM students by substantially expanding their capacities to attract, develop, and support STEM student talent. Historically, Philadelphia AMP has more than tripled its annual minority STEM B.S. degree rate of production which has risen from 201 degrees to 1,047 degrees as of 2017, and is providing direct services to over 3,100+ students on an annual basis.

This session will provide an overview of the following:

- An Alliance framework that allows partners to participate in the development and implementation of programs and institutional shifts to support increased STEM degree production for underrepresented minority students; and
- The integration of existing initiatives running parallel to the LSAMP framework.

**11:00 - 11:20 A.M.**

**Teaching Community Engagement to Engineers**

*Lecture Hall 1*

Michael Bernstein  
Jameson Wetmore  
*Arizona State University*

Matthew Harsh  
*Concordia University*

Susan Cozzens  
Rafael Castillo  
*Georgia Institute of Technology*

Thomas Woodson  
*Stony Brook University*

Even though successful engineers must engage with the community for their projects to succeed, they are not taught basic community engagement techniques during their education. A team of faculty at five different universities developed a community engagement workshop that introduces science and engineering graduate students and early professionals to the complexities and challenges of community engagement and development. During the two-day workshop participants engaged in a variety of exercises that taught them to listen to their community partners, look beyond the technology, and empower the community. This presentation describes the workshop's learning objectives, design, activities and results from the evaluation. The results from this presentation will help other educators develop courses and programs to train holistic engineers for the social good.

**11:00 - 11:20 A.M.**

**Increasing Interest in STEM by Underrepresented Groups through Packaging Research**

*Lecture Hall 2*

Kim Smith  
David Tonjes  
*Stony Brook University*

The results of an experiential learning project in the field of solid waste and resource management are presented. A project-based learning method was employed, in a course titled "Packaging Research" which was part of the school's Collegiate Science and Technology Entry Program (CSTEP). The goal of this six session Saturday class was to introduce 9th and 10th grade high school students, who met eligibility criteria by attending schools in areas that are economically disadvantaged, to the concepts of scientific discovery. The students self-selected to enroll in the course, and had mathematical and scientific study deficits. We used a variety of common household products to focus on practicing the scientific method and learning about the concepts of precision and accuracy, by weighing their contents and packaging. This exercise was put into context by comparing the results to data generated on the same set of product types 30 years ago (in a report from the congressional Office of Technology Assessment). Some other waste management concepts were introduced to the students in discussions that focused on costs and benefits of modern packaging.

**11:30 A.M - 12:00 P.M.**

*Wang Center*

**NETWORKING BREAK**

**12:00 - 1:30 P.M.**

*Wang Center Theater Lobby*

**LUNCH**

**1:30 - 2:30 P.M.**

*Wang Center Lecture Hall 2*

**PLENARY SESSION VI**

### **Introduction and Moderator**

Eliza Reilly

Executive Director

*National Center for Science and Civic Engagement*

### **Plenary Address: The Changing National Landscape of Undergraduate STEM Education: Connecting (and Reconnecting) the Dots**

Jay Labov

Senior Advisor for Education and Communication

*National Academies of Sciences, Engineering, and Medicine*

This session will focus on recent national trends to improve undergraduate and K-12 STEM education and how 1) understanding the intersections of various components of the education system and 2) education policy can lead to more informed decision making at the local and state levels. Learning goals for this session include:

- Briefly reviewing recent national reports on the improvement of undergraduate education in STEM, including more closely integrating STEM with the humanities and arts, and how they might inform discussions on your campus.
- Exploring the changing relationships among several components of the undergraduate STEM education “ecosystem.”
- Recognizing and understanding the growing influence of K-12 education on what you do and your role in influencing K-12 education to increase the number of college-educated STEM graduates.

**2:30 - 3:30 P.M.**

*Wang Center Lecture Hall 2*

**CLOSING SESSION**

# Biosketches of Plenary Speakers and NCSCE Staff

## **Myles Boylan**

Program Director, Division of Undergraduate Education (DUE)  
*National Science Foundation*

Myles Boylan has been a Program Director at the National Science Foundation (NSF) in the Division of Undergraduate Education from 1996. Since 2009 he has co-lead TUES (Transforming Undergraduate Education in STEM), WIDER (catalyzing institution-wide implementation of evidence-based teaching methods), and IUSE (Improving Undergraduate STEM Education). His IUSE program work has increasingly emphasized institutional transformation. Beginning in May of this year he is focused on synthesizing knowledge about what has been learned about improving undergraduate STEM Education and how to induce faculty, departments, and institutions to make commitments to use evidence-based teaching methods. Myles' doctoral work was in industrial economics. He held a variety of academic appointments before joining the NSF. His academic research focused on the process and diffusion of technological innovation and at NSF is currently focused on accelerating the diffusion and propagation of effective teaching.

## **Robert Catell**

Chairman, Advanced Energy Research and Technology Center  
*Stony Brook University*

Mr. Catell was formerly the Chairman and Chief Executive Officer of KeySpan Corporation and KeySpan Energy Delivery, the former Brooklyn Union Gas. His career with Brooklyn Union Gas started in 1958. Following National Grid's acquisition of KeySpan Corporation, Mr. Catell became Chairman of National Grid, U.S. and Deputy Chairman of National Grid plc.

He currently serves as Chairman of the Board of the Advanced Energy Research and Technology Center (AERTC) at Stony Brook University, New York State Smart Grid Consortium, Cristo Rey Brooklyn High School, and Futures in Education Endowment Fund.

Mr Catell serves on the Board of the following not for profit organizations: Colin Powell School for Civic and Global Leadership, Department of Education; Diocese of Rockville Centre, Feinstein Institute for Medical Research, St. Francis Hospital Foundation, and the New York City Police Foundation.

He also serves on the Board of the following business organizations: A+Technologies, Applied DNA Sciences Inc., BioRestorative Therapies, Long Island Angel Network (LIAN), Long Island Association (LIA), National Petroleum Council, ThermoLift Inc., and the Water Company, LLC.

He Chairs the Advisory Board for Applied DNA Sciences Inc., and serves on the Advisory Board for: Advanced Power North America (APNA), CAI Investments, the Center for Urban Sciences & Progress (CUSP), EC Infosystems, Gold Coast Bank, Our Energy Policy Foundation, Posillico Inc., the President's Advisory Council at Adelphi University, VNG.CO, and the Winthrop Hospital Board of Regents.

Mr. Catell is an Executive in Residence at Hofstra University and was named the first "John J. Phelan, Jr. Fellow" of the Robert B. Willumstad School of Business at Adelphi University.

Mr. Catell is a former Chairman of the American Gas Association, Brooklyn Chamber of Commerce, KEYERA Energy Management Ltd., Long Island Association, Partnership for New York City, Inc., U.S. Energy Association (USEA), Business Council of NYS, the Advisory Board of the City College of New York's School of Engineering, and the Downtown Brooklyn Partnership.

Mr. Catell is a former board member of: the Brooklyn Public Library Foundation, City College of New York 21st Century Foundation, Edison Electric Institute (EEI), Energy Association of NYS, Long Island Foreign Affairs Forum, National Grid Foundation, New York Academy of Sciences, New York State Economic Development Power Allocation Board (EDPAB), New York State Energy Research & Development Authority (NYSERDA), Tomorrow's Hope Foundation, the advisory board of HeartShare for Human Services, and the Brooklyn Law School (Member Emeritus).

Mr. Catell is a member of the Association of Energy Engineers, CUNY Business Leadership Council, National Society of Professional Engineers, NYS Society of Professional Engineers, and the Society of Gas Lighting.

Mr. Catell received both his Bachelor's and Master's degrees in Mechanical Engineering from the City College of New York and is a registered Professional Engineer. He has attended Columbia University's Executive Development Program, and the Advanced Management Program at the Harvard Business School.

### **Edward Coyle**

Director of the Arbutus Center for the Integration of Research and Education  
*Georgia Institute of Technology*

Edward J. Coyle is the John B. Peatman Distinguished Professor of Electrical and Computer Engineering at the Georgia Institute of Technology and a Georgia Research Alliance Eminent Scholar. He is the Founder and Director of the Vertically Integrated Projects (VIP) Program, which integrates research and education by embedding large-scale, long-term teams of undergraduates in the research efforts of faculty and their graduate students. He is also the Director of the VIP Consortium, a set of 28 universities that have VIP Programs and work together to improve, evaluate, and disseminate it. Dr. Coyle was a co-recipient of the U.S. National Academy of Engineering's 2005 Bernard M. Gordon Prize for Innovation in Engineering and Technology Education. In 1998, Dr. Coyle was elected a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) for his contributions to the theory of nonlinear signal processing. He has received a number of other awards, including the 1997 Chester F. Carlson Award from the American Society for Engineering Education and the 1986 Paper Award from IEEE Signal Processing Society. His current research interests include systemic reform of higher education, signal and information processing, and wireless and sensor networks.

### **David Ferguson**

Distinguished Service Professor, Technology and Society, and Provost's Scholar  
*Stony Brook University*

David Ferguson holds a Ph.D. from the University of California, Berkeley where he studied mathematics and mathematics education. He is a distinguished service professor in the Department of Technology and Society in the College of Engineering and Applied Sciences at Stony Brook University. He holds affiliated appointments in Applied Mathematics and Statistics, and Computer Science. In addition to his departmental responsibilities, he holds the position of Provost's Scholar for Leadership and Transformation in Diversity. He helped to establish the Department of Technology and Society at SUNY Korea. He has directed numerous projects, including a dozen NSF projects, aimed at improving science, technology, engineering, and mathematics (STEM) education at both the undergraduate and graduate levels. His research and teaching thrusts are in the areas of problem solving, advanced technologies in the learning and teaching of mathematics and science, and socio-technological decision-making. Dave is a New York State and national leader in programs to enhance the participation of underrepresented groups in science and engineering. He directs two NSF-funded projects in this area: the SUNY Louis Stokes Alliance for Minority Participation (LSAMP), and the Alliance for Graduate Education and the Professoriate-Transformation Project (AGEP-T). He is PI on Stony Brook's Science and Technology Entry Program (STEP) and Collegiate Science and Technology Entry Program (CSTEP)—both funded by the New York State Education Department. He is the recipient of several awards: the U.S. Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM), the Archie Lacey Award of the New York Academy of Sciences, and the Engineering Educator Award of the Joint Committee on Engineering of Long Island. Dave is also a Co-Principal Investigator for SENCER.

**Heather Hage**

Vice President for Industry and External Affairs

*The Research Foundation for the State University of New York*

Heather Hage is Vice President for Industry and External Affairs for The Research Foundation for the State University of New York. Devoted to stakeholder engagement and community building through authentic and articulate communication, Heather oversees SUNY RF's external relations, corporate communications, government affairs, technology transfer, and industry-facing business systems, and is Managing Director of SUNY's Technology Accelerator Fund. A graduate of Hamilton College and Albany Law School, where she was Managing Editor of the Journal of Science and Technology, Heather's professional background includes media relations, telecommunications, IP management and corporate finance. An active investor and board member, Heather is the recipient of SUNY RF's 2015 Woman of Excellence award for outstanding service, exemplary support of women in leadership, and a distinguished career.

**Lydia Franco-Hodges**

Curriculum Designer

*Alda Center for Communicating Science*

Lydia Franco-Hodges, MFA, leads workshops for scientists throughout the country and around the world enhancing their communication skills through improvisation and theatre techniques. Lydia is an associate of the Alan Alda Center for Communicating Science, a lecturer in the School of Journalism, and an actor and theatre-maker. As a member of the Alda Center creative team, she helps develop curricula and teaches the graduate courses at Stony Brook University. Lydia also taught acting, movement and performance at the university for many years, and applauds the work created by her students. Communication was the beating heart of these practices, and today, inspired by the vital work of STEM and medical professionals, communicating salient ideas and connecting people are even more paramount.

**Martha James**

Program Officer, Directorate for Education and Human Resources, Division of Human Resource Development

*National Science Foundation*

Martha James is a career federal program officer at the National Science Foundation (NSF). She has been employed with NSF for 32 years working in program and administrative management in several NSF directorates, including Engineering, Administration, the Office of the Director, Social, Behavioral and Economic Sciences, and Education and Human Resources. She has a Master of Science in Administration from Trinity University, Washington, DC.

Currently, Ms. James is Acting Co-Program Lead for the Louis Stokes Alliances for Minority Participation (LSAMP) program and also serves on the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Sciences (NSF INCLUDES) Implementation Team. She was first assigned to the LSAMP program in 2006 and to the NSF INCLUDES initiative in 2016. Over the past four years, she has been Co-Team Lead for White House Honorary Awards Programs administered by NSF: Presidential Awards for Excellence in Science and Mathematics Teaching (PAEMST) and the Presidential Awards for Excellence in Science Mathematics, and Engineering Mentoring (PAESMEM).

Prior to joining HRD, Ms. James was assigned to NSF's Office of the Experimental Program to Stimulate Competitive Research (EPSCoR) managing research infrastructure projects in the Northeast region, the Dakotas, Nebraska, Puerto Rico, the U. S. Virgin Islands and Wyoming. She served the office again in 2012 to manage research infrastructure portfolios, outreach and broadening participation activities.

**Jay Labov**

Senior Advisor for Education and Communication  
*National Academies of Sciences, Engineering, and Medicine*

Jay Labov has been an employee of the National Academies of Sciences, Engineering, and Medicine for the past 23 years, most recently serving as Senior Advisor for Education and Communication since 2008. He has directed or contributed to some 30 National Academies reports focusing on undergraduate education, teacher education, advanced study for high school students, K-8 education, and international education. He has served as Director of the National Academies' Teacher Advisory Council, and was Deputy Director for the Academy's Center for Education. He directed a committee of the NAS and the Institute of Medicine (now the Academy of Medicine) that authored Science, Evolution, and Creationism and has overseen the National Academy of Sciences' efforts to confront challenges to teaching evolution in the nation's public schools. He coordinates efforts at the Academies to work with professional societies on education issues. He also oversaw work on improving education in the life sciences under the aegis of the Academy's Board on Life Sciences. He began phased retirement from the National Academies in January, 2018 and continues to work part time on various studies.

Dr. Labov is an organismal biologist by training. Prior to accepting his position at the National Academies in 1997, he spent 18 years on the biology faculty at Colby College (Maine). He is a Kellogg National Fellow, a Fellow in Education of the American Association for the Advancement of Science, a Woodrow Wilson Visiting Fellow, and a 2013 recipient of the "Friend of Darwin" award from the National Center for Science Education. In 2013 he was elected to a three year term beginning in 2014 in which he served as chair-elect for 2014, chair for 2015 and past chair for 2016 of the Education Section of the American Association for the Advancement of Science (AAAS). He was subsequently elected to a three year term to represent the Education Section on the AAAS Council beginning in 2017 and to a two-year term on the Council's Executive Committee beginning in 2018. In 2014 he was named a Lifetime Honorary Member by the National Association of Biology Teachers, that organization's highest award and recognition. He received an Academies Staff Award for Lifetime Achievement in December, 2014 and was named by the Society for Integrative and Comparative Biology as the John A. Moore Lecturer for 2016. He also received the Distinguished Service to Science Education Award from the National Science Teachers Association in April, 2016. In May 2018 he received the Leadership in Science and Engineering Award from the Washington (DC) Academy of Sciences.

**Andre Marshall**

Program Director for the Industry University Cooperative Research Centers Program (IUCRC)  
*National Science Foundation*

Andre Marshall joined NSF in 2017 as Program Director for the Industry University Cooperative Research Centers Program (IUCRC) on assignment from University of Maryland, College Park. His experience spans roles as a corporate R&D engineer, an academic, and an entrepreneur. He joined the faculty of University of Maryland after developing patented next-generation low-emission technology for Rolls-Royce as part of the NASA Advanced Subsonic Transport (AST) program. At University of Maryland, Dr. Marshall is an Associate Professor in the Department of Fire Protection Engineering and Director of the Fire Testing and Evaluation Center (FireTEC). His research interests include fire suppression sprays and fire induced turbulent transport. In 2007, Dr. Marshall received the prestigious NSF Presidential Early CAREER Award for Scientists and Engineers (PECASE) for his research on spray characterization. The PECASE award is the highest honor bestowed by the U.S. government on scientists and engineers in the early stages of their independent research careers. Prof. Marshall's research team has collaborated with Fortune 500 companies such as FM Global and United Technologies on a variety of fire suppression challenges. In 2012, Prof. Marshall established a technology start-up team through the NSF I-Corp program focused on commercializing innovations in spray technology. His technology is currently being licensed in the fire protection industry to improve fire sprinkler system design, evaluation, and optimization.

**Derek Peterson**

Founder and CEO

*Soter Technologies*

Mr. Derek Peterson, Founder and CEO of Soter Technologies, has been named an NCSCE Fellow for Technological Innovation and Collaboration. In this role, Derek will support the efforts of NCSCE to grow collaborations between higher education and industry that result in socially beneficial science and engineering. Derek's broad perspective on socio-technological innovation and its promise for improving life, in all its forms, makes him a tremendous asset for NCSCE.

Derek Peterson is the Founder and CEO of Soter Technologies, headquartered in Hauppauge, New York. As a teen Derek was fascinated with computers and technology and has been developing software since high school. Today, he is a high energy business leader and focused problem solver who leverages his knowledge and technological expertise to address complex social, business and community safety challenges.

Always seeking to be better and learn, Derek sees problems as puzzles. He believes that no puzzle is impossible to solve; all he needs is the time to figure them out.

A former bullying victim as a high school student Derek is dedicated to creating technology to address this problem in school. As CEO of Soter Technologies, he Peterson leads a rapidly growing team of technology experts, software engineers and inventors who are devoted to the practical application of technology to improve and save lives. The "Soter" name is inspired by the ancient Greek god of safety, deliverance and preservation from harm. Using advanced sensor and software technology, the company develops and delivers innovative solutions for environmental intelligence – to make the world a safer place. In the education space, Soter's Digital Fly product line includes a suite of innovative tools for bullying detection and prevention. These products and services are making an impact in schools across the nation and have been credited with saving the lives of students who were contemplating suicide.

Derek's software and innovations have received awards as well as national media attention. Soter's Fly Sense vaping detection and anti-bullying sensor is attracting national attention and was featured on ABC's Good Morning America, Fox 5 New York and many other media outlets across the United States and abroad. Derek is regularly interviewed by the media about entrepreneurship, technology and how it is being used to reduce and prevent bullying and cyber bullying at schools and in communities.

He has a proven track record in the high tech and software sector and has held senior and key roles at IPS, Symbol Technologies (\$1.6B NYSE company), and Neohapsis (bought by Cisco). In 2003, he co-founded CBD, Inc. to apply his experience to assist emerging technologies in libraries and public schools.

Today, Derek is consider a national thought leader and expert in regard to the Internet of Things (IOT) and currently writes for TechTarget / IOT Agenda. He regularly speaks at colleges, universities and conferences across the United States on technology subjects.

Derek has expertise working in many industries, including the accounting profession where he developed some of the country's first tax software and the public sector where he developed the first Public Computer Management system, monitoring user access, authentication and security in libraries and universities. His solutions have been deployed on over 100,000 desktops worldwide.

Early in his career, Derek led the development and delivery of key security products for the gambling and airline industries. He also created the Engineering Test and Validation department at Symbol Technologies (Motorola/Zebra). Through the creation of T & V, he re-engineered the process on how products were developed at Symbol Technologies. When Derek is away from developing new technologies, software products and solutions for Soter Technologies, he enjoys spending time with his family, training for Ironman Triathlons and using his high tech skills and knowledge to customize his high performance automobiles. Giving back to his community and supporting young people is important to Derek. He is involved in several community groups and is the Treasure for the Timothy Hill Children's Ranch located in Riverhead, New York. This not-for-profit includes residential programs that provide a safe haven for at-risk young people and help them restore their lives through a holistic approach that focuses on mind, body & soul.

Derek earned a BS in Computer Science and Applied Math from Stony Brook University in New York in 1988. A lifelong resident of Long Island, he is committed to being a mentor and advisor for students. He is a sponsor of and has judged Stony Brook University's "Wolfie Tank" competition. A spin off from the popular NBC reality TV series "Shark Tank," Stony Brook University's "Wolfie Tank" caters towards aspiring student entrepreneurs from the College of Engineering and Applied Sciences who have developed innovative technologies and inventions and make business presentations to a panel of esteemed judges.

### **Eliza Reilly**

Executive Director

*National Center for Science and Civic Engagement*

Eliza Reilly is the Executive Director of the National Center for Science and Civic Engagement. Eliza has two decades of experience in the design and implementation of programs and materials to advance curriculum, academic leadership and faculty development. She has served as the Executive Director of the American Conference of Academic Deans and as a Director of Programs at the Association of American Colleges and Universities, where she was one of the original staff members for the SENCER initiative. In the last decade she has focused on campus-based faculty development and curricular integration through directorships of the Center for Liberal Arts and Society and the Phillips Museum of Art at Franklin & Marshall College, where she also had a faculty appointment in American Studies. Eliza holds a M.A. in the History of Art and a Ph.D. in American History from Rutgers University. She has been an ongoing participant in SENCER and the National Center's other programs since 2001 and currently serves as the Executive Director for NCSCE. She is also the General Editor of the SENCER Models and the co-Editor of the journal.

### **Ethel Rubin**

Entrepreneur-in-Residence, Office of Extramural Research

*National Institutes of Health*

Ethel Rubin is a technology commercialization and investment executive who leads new initiatives in the biomedical technology industry and decision making for new venture investments. She has led teams and initiatives in both large global and early stage companies that led to significant value creation and funding commensurate with increases in valuation. In her current role as Entrepreneur-in-Residence at the NIH and Maryland's BioHealth Innovation, her efforts cross the funding spectrum, enabling VCs and Corporate strategics to identify opportunities for investment while mentoring CEOs on business strategy attractive to investors.

"Sharktank" of the Biohealth Capital region, Dr. Rubin works with bio and med tech companies to raise funds while progressing their product development to significant inflection points and preparation for product launch. She has held corporate leadership roles in global clinical strategy and medical affairs at Medtronic, plc, was Chief Scientific Officer of two startup companies, is President of life sciences business development advisory firm Innovative BioStrategies, LLC, and a venture partner at FundRx. She has over 25 products in the marketplace garnering 8 figure sales revenue, was instrumental in 3 M&As, multiple partnerships/academic collaborations, and coaches over 50 CEOs in preparation for seed to series B financing each year. Representative companies include regenerative and precision medicine, hematology, NASH, obesity and metabolic disease drugs, cardiac and surgical devices, gene therapy for rare diseases.

Dr. Rubin holds a PhD in Biochemistry and Biophysics from the University of Rochester School of Medicine & Dentistry and obtained a certificate in Board of Directors governance from The George Washington University School of Business. She performed breast cancer research as a postdoctoral fellow in molecular Oncology at The Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins and has held numerous leadership roles in organizations as diverse as Women In Bio and The Emerging Technology Centers in Baltimore. She is an invited speaker, panelist or moderator at numerous innovation and investment conferences and an active blogger and contributor to public forums. Check out her posts at [www.linkedin.com/in/ethelrubinphd](http://www.linkedin.com/in/ethelrubinphd).

### **Peter Small**

Founding Director of the Global Health Institute  
*Stony Brook University*

Peter Small joined Stony Brook in 2015 as the Jim and Robin Herrnstein Professor of Medicine and the Founding Director of the University-wide Global Health Institute

Peter was a medical resident and chief medical resident at UCSF during the dawn of the HIV epidemic. He subsequently moved to Stanford where he completed an Infectious Disease fellowship and spent about a decade on the faculty of Stanford's Infectious Disease Division. During these years, he published pioneering molecular epidemiologic papers that helped to shape the public health response to the resurgence of tuberculosis and seminal papers on mycobacterial genomics.

In 2002 he was one of the early employees of the Bill and Melinda Gates Foundation where he developed their tuberculosis strategy, built the foundation's core partnerships and country programs, hired and manage the Foundation's TB team and oversaw a large portfolio of vaccine, drug and diagnostic product development activities. In 2011, he relocated to India where he established the foundation's tuberculosis program in India.

Dr. Small is a member of numerous professional and honorary societies was recently named as one of the inaugural fellows of the Rockefeller Foundation to provide guidance and support to their efforts to bring innovation to improve the health of the global poor.

### **Kyle Simmons**

Faculty Development Events Manager  
*National Center for Science and Civic Engagement*

Kyle Simmons is the Faculty Development Events Manager for NCSCE, SENCER and related initiatives. In this role, he plans and manages NCSCE's signature annual events, the SENCER Summer Institute and the DC Symposium, and provides support for other regional meetings. He also works with regional organizations and initiatives to ensure communication and the sharing of best practices. Kyle brings with him experience from his work with the Junior Statesmen Foundation, where he planned and managed civic education conferences for high school students. Kyle holds a B.A. in political science from Howard University.