SENCER

SCIENCE EDUCATION FOR NEW CIVIC ENGAGEMENTS AND RESPONSIBILITIES

2017 SENCER Summer Institute

Stony Brook University
August 3-6, 2017

NSF

NATIONAL CENTER FOR SCIENCE & CIVIC ENGAGEMENT

Stony Brook University

W.M. KECK FOUNDATION

INSTITUTE of Museum and Library SERVICES

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www.sencer.net **Twitter: @SENCERnet**

#SSI2017

TABLE OF CONTENTS

SENCER

SCIENCE EDUCATION FOR NEW CIVIC ENGAGEMENTS AND RESPONSIBILITIES

Greetings and welcome! This is our 17th SENCER Summer Institute and we are delighted to be at our new home Institution, Stony Brook University. We are excited to share the results of the new collaborations and opportunities we have pursued since our move here in November 2015. Special thanks to Dave Ferguson, chair of the Technology and Society department where NCSCE is now based.

We have worked to create a meeting rich with opportunities for you to begin accomplishing the goals that brought you here. But our days together also offer opportunities for networking, learning from one another, thinking about things in new ways, and for planning to stay connected. The SENCER Summer Institute opens up possibilities for working with our SENCER Leadership Fellows (for collegial advice and support), our SENCER Centers for Innovation (for continuity and work on issues of regional significance), with the National Center (for access to national resources), and with folks facing similar challenges and pursuing similar goals.

There are a few features of the SSI 2017 program that we would like to call to your attention:

- We are continuing the use of mobile application this year. We hope that its abilities to facilitate a personal schedule, networking, and social media interactions will continue to enrich your experience at the Institute.
- We are continuing with a new note taking and planning strategy, designed for us by Stephen Carroll of Santa Clara University, a leader of our assessment initiative. Please familiarize yourself with the materials and complete the warm-up exercise before you attend the sessions, if possible.
- In order to provide you with a more customizable experience at SSI, we are continuing the use of session blocks, during which sessions of different lengths will run concurrently.
- We are trying a new consultation format, during which experts in our community will engage in what we hope will be targeted and productive discussion about various topics of concern to you all as educators. We hope these conversations will lead to ideas and strategies that will prove useful after the Institute.

In the spirit of scientific inquiry and democratic practice, we conceived of SENCER as an experiment. We use the critiques and suggestions of those with whom we have worked to shape our planning. Do not hesitate to make suggestions and, by all means, please complete our online evaluation. We take your advice very seriously.

We look forward to working with you and are confident that we will accomplish much together.

SENCER SUMMER INSTITUTE 2017

BY THE NUMBERS

205 Invited Participants and Facilitators

44 Groups and Teams
58 Individual Participants

108 New Participants
97 Alumni Participants

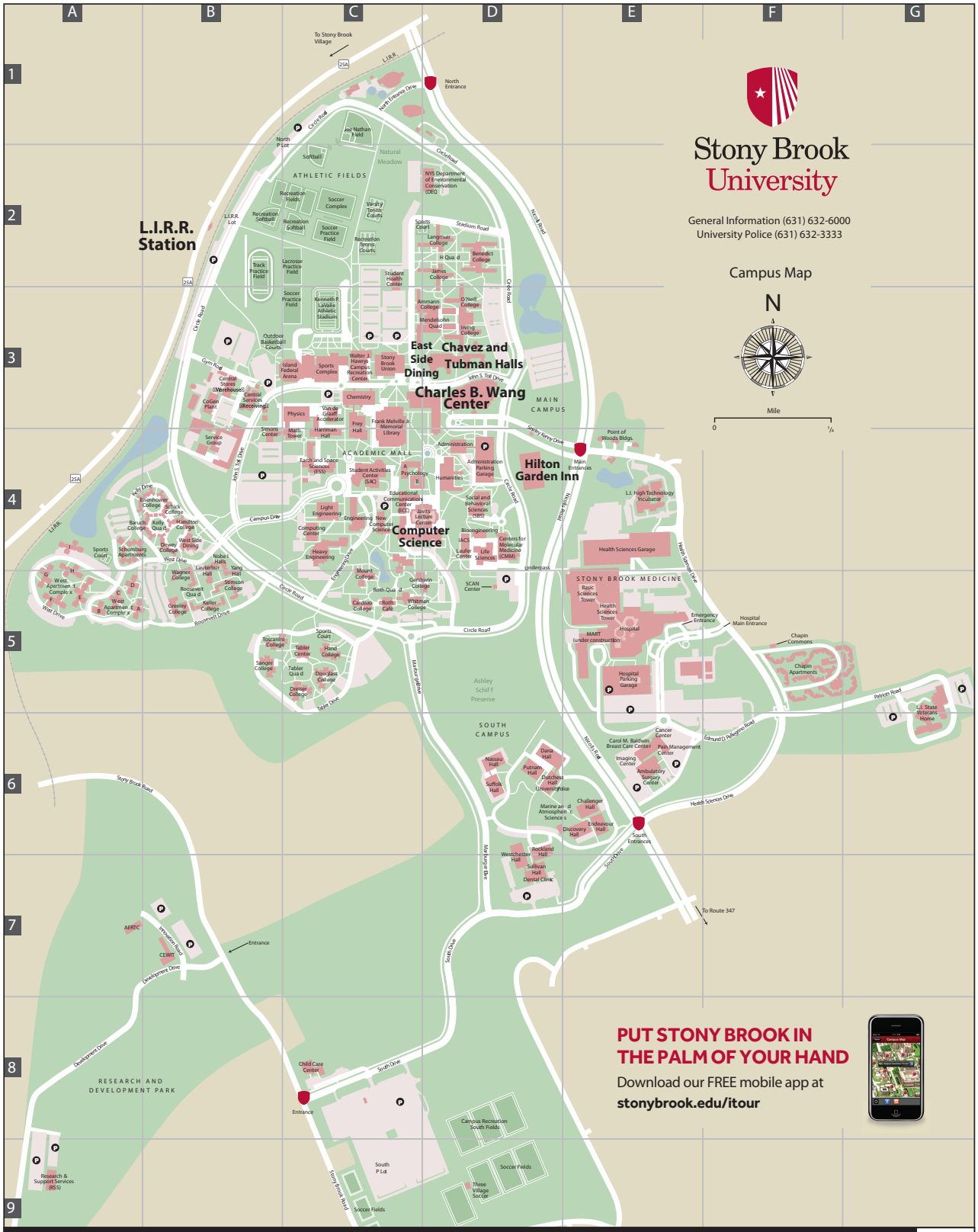
We welcome representatives from 103 colleges and universities, informal science education institutions, non-profits, government agencies, school systems, and foundations.

SUSTAINABILITY AT SSI 2017

In the interest of minimizing the environmental impact of SSI on our host campus and its community, we have continued some traditions from previous meetings, and have begun a few new ones at this year's Institute:

- We have provided tote bags, tumblers which are reusable with both hot and cold beverages, and flash drives to each participant so that you will be able to use these items after the Institute ends.
- The SENCER Summer Institute Mobile Application has drastically reduced the size of the program book, saving paper by allowing participants to find presenter biographies and detailed contact information in the application.
- Our session presenters are continuing use of digital materials rather than paper, where possible, and finding ways to print fewer materials without sacrificing the quality of their sessions.

Going forward, we are always open to further ideas of how we can create a more sustainable meeting. Please let us know if you have any suggestions of how we can be a greener organization and put on greener events.



SSI 2017 Important Locations (bolded and enlarged text)

LIRR Station: B2
Charles B. Wang Center: D3
Hilton Garden Inn: B4
Computer Science Building: C/D4
East Side Dining: D3
Chavez/Tubman Halls: D3

SSI 2017 INTERNET INFORMATION, SHUTTLE INFORMATION, PARKING INFORMATION, AND STAFF INFORMATION

SSI 2017 INTERNET ACCESS INFORMATION

The Stony Brook University IT Department has sent internet access to all registered SSI 2017 participants. In the case you did not receive one, you can use the **"WolfieNet-Guest**" network. To log in, connect to WolfieNet-Guest and open your web browser. You will be given a choice to register for the first time as a guest, or to enter your login credentials if you already have an existing account.

SSI 2017 SHUTTLE INFORMATION

If you are staying at the **Holiday Inn Express**, you may call their front desk at (631) 471-8000 to request a shuttle between the hotel and campus. Please attempt to board the shuttle in groups to minimize both wait times for other participants, and the environmental impact of your travel.

SSI 2017 PARKING INFORMATION

Parking is free for guests of the Hilton Garden Inn and Holiday Inn Express Hotels in their respective parking lots. Parking is also free near the Tubman and Chavez Residence Halls.

Paid parking is available near the Charles B. Wang Center in the **Administration Lot**.

SSI 2017 STAFF INFORMATION

Wendy Low is the SENCER-ISE Assistant. Wendy supports partners engaged in SENCER's informal science work through the Partnership Champions program, funded through a grant from the Institute of Museum and Library Services, and Maximizing Collective Impact, which is supported by the National Science Foundation's Advancing Informal STEM Learning (AISL) program. She also works with KQED and the DoNowU project.

Wendy earned her B.S. in Biological Sciences from the University of Denver, where she also was an active member of the Social Justice Living and Learning Community. She previously held an internship at the United States Holocaust Memorial Museum in Visitor Services and currently interns in the Division of Future Projects running a 360 Video Program in the museum. She has experience facilitating cross-cultural dialogue and storytelling trainings. In her free time, Wendy teaches at a local rock climbing gym.

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 bachelor's degree in political science from Howard University.

On-site staff may be reached at **(202) 483-4600.**

STAFF OFFICE LOCATION

SSI staff will be available through the institute to assist all participants and facilitators. From breakfast until the last session of the day (when receptions or dinners begin), you may find SSI staff in **1416 Computer Science.**

IN CASE OF EMERGENCY

In case of emergency after Institute hours, please call **(202) 276-2343** once emergency personnel have been notified. A staff member will be available overnight to answer your call.

SENCER Summer Institute 2017 Schedule at a Glance

Time	Event	Location
Thursday, August 3, 2017		
8:15 AM - 4:00 PM	**SSI 2017 Check-in**	Wang Center Lobby
8:30 AM - 3:30 PM	**Invitational Workshop: Excellence and Diversity in Engineering Education: Academia, Industry and Government**	Wang Center Room 301
10:00 AM - 1:00 PM	**Invitational SCI Co-Director Meeting**	Wang Center Room 201
1:00 - 4:00 PM	**Invitational SENCER Advisory Group Meeting**	Wang Center Room 201
4:30 - 6:30 PM	**SENCER Summer Institute 2017 Opening Plenary Address**	Wang Center Theater
6:30 - 8:00 PM	**SENCER Summer Institute Opening Gala Dinner**	Wang Center Zodiac Lobby
Friday, August 4, 2017		
7:00 - 8:30 AM	**Breakfast**	Hilton Garden Inn University Ballroom
8:30 - 10:00 AM	**All-Institute Plenary Session II**	Hilton Garden Inn University Ballroom
10:10 AM - 12:00 PM	**Session Block I**	Stony Brook Classrooms
12:00 - 1:15 PM	**Lunch**	Hilton Garden Inn University Ballroom
1:15 - 2:15 PM	**Team Time, Initiative Meetings, and Group Consultation Sessions**	Stony Brook Campus
2:30 - 4:20 PM	**Session Block II**	Stony Brook Classrooms
4:30 - 6:00 PM	**Poster Presentations**	Hilton Garden Inn University Ballroom
Saturday, August 5, 2017		
7:00 - 8:30 AM	**Breakfast**	East Side Dining
8:30 - 10:00 AM	**All-Institute Plenary Session III**	Wang Center Theater
10:10 AM - 12:00 PM	**Session Block III**	Stony Brook Campus
12:00 - 1:15 PM	**Lunch**	East Side Dining
1:30 - 3:30 PM	**All-Institute Plenary Session IV**	Wang Center Theater
3:40 - 5:30 PM	**Session Block IV**	Stony Brook Classrooms
5:30 - 7:00 PM	**Dinner Recognizing Achievements in the NCSCE Community**	Wang Center Zodiac Lobby
Sunday, August 6, 2017		
7:00 - 8:30 AM	**Breakfast**	East Side Dining
8:30 - 10:00 AM	**All-Institute Plenary Session IV**	Congress Lounge
10:10 - 11:00 AM	**Session Block V**	Stony Brook Classrooms
11:00 AM - 12:30 PM	**Brunch**	East Side Dining
12:30 - 2:00 PM	**Team Time, Regionalization Meetings**	Stony Brook Campus
2:00 - 3:50 PM	**Session Block VI**	Stony Brook Classrooms
4:00 - 4:30 PM	**Institute Adjournment Session**	Wang Center Theater

During sessions on Thursday, Saturday, and Sunday, the SENCER Cafe will be open in the Wang Center Lobby for participants to mingle and get refreshments. On Friday, the SENCER Cafe will be outside of the University Ballroom in The Hilton Garden Inn Stony Brook

SENCER Summer Institute 2017 Daily Schedules at a Glance

<table>
<tr><th>Time</th><th colspan="4">Thursday, August 3, 2017</th></tr>
<tr><td>8:0 0 A</td><td rowspan="15">Check-in
(8:15am-4:00pm) -
Wang Main Lobby</td><td rowspan="3"></td><td rowspan="6"></td><td></td></tr>
<tr><td>8:3 0 A</td><td rowspan="14">Engineering Workshop
(8:30am-3:30pm) - Wang 301</td></tr>
<tr><td>9:0 0 A</td></tr>
<tr><td>9:3 0 A</td><td rowspan="5">SCI Co-Director Meeting
(10:00am-1:00pm) -
Wang 201</td></tr>
<tr><td>10:0 0 A</td></tr>
<tr><td>10:3 0 A</td></tr>
<tr><td>11:0 0 A</td></tr>
<tr><td>11:3 0 A</td><td rowspan="8">Advisory Group Meeting
(1:00-4:00pm) - Wang 201</td><td rowspan="5">IMLS Partner Meeting
(2:00-3:30pm) - 1310 Comp Sci</td></tr>
<tr><td>12:0 0 P</td></tr>
<tr><td>12:3 0 P</td></tr>
<tr><td>1:0 0 P</td></tr>
<tr><td>1:3 0 P</td></tr>
<tr><td>2:0 0 P</td><td rowspan="2"></td></tr>
<tr><td>2:3 0 P</td></tr>
<tr><td>3:0 0 P</td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>3:3 0 P</td></tr>
<tr><td>4:0 0 P</td><td colspan="4"></td></tr>
<tr><td>4:3 0 P</td><td colspan="4" rowspan="3">SSI 2017 Opening Plenary Address with Fotis Sotiropoulos (4:30-6:30pm) -Wang Theater</td></tr>
<tr><td>5:0 0 P</td></tr>
<tr><td>5:3 0 P</td></tr>
<tr><td>6:0 0 P</td><td colspan="4" rowspan="3">Dinner (6:30-8:00pm) - Wang Zodiac Lobby</td></tr>
<tr><td>6:3 0 P</td></tr>
<tr><td>7:0 0 P</td></tr>
<tr><td>7:3 0 P</td><td colspan="4"></td></tr>
</table>

Time	Friday, August 4, 2017					
7:0 0 A 7:3 0 A 8:0 0 A	Breakfast (7:00-8:30am) - **Hilton Garden Inn University Ballroom**					
8:3 0 A 9:0 0 A 9:3 0 A	Elyse Eidman-Aadahl Plenary Address (8:30am -10:00am) - **Hilton Garden Inn University Ballroom**					
10:0 0 A 10:3 0 A	Expanding SENCER Principles to K-12 Educational Settings - **Wang 201**	Evidence of Student Learning and Change - **Hilton Garden Inn Library**	Thinking and Talking About Re/Designing a SENCER Course - **Wang 301**	A Hands-On Course Series Designed to Engage Students in Unique and Important Research - **Life Sciences Building Greenhouse - Basement Level**	A WAC-y Project: How Writing Across the Curriculum (WAC) Made Civic Engagement Even Better - **Wang 101** The Evolution of a Music and Science Course - **1310 Comp Sci**	SENCER Cafe - **Hilton Garden Inn Lobby**
11:0 0 A 11:3 0 A	NGSS: Roles and Responsibilities of STEM Faculty in the Preparation of K-12 Teachers - **Wang 201**	Beyond Assessment: Designing Informative Evaluations of Student Learning - **Hilton Garden Inn Library**	SENCER and Informal Science Education - **Wang 301**	STEM-Humanities Partnerships to Foster Responsible and Global Thinking - **Wang 102**	The Advantages and Challenges of Using Concept Mapping in Biology Courses at a Community College - **Wang 101**	
12:0 0 P 12:3 0 P	Lunch (12:00- 1:15pm) - **Hilton Garden Inn University Ballroom**					
1:0 0 P 1:3 0 P 2:0 0 P	Team Time, Group Consultations IMLS Meeting (1:15- 2:15pm)					
2:3 0 P 3:00 P	Keeping Your Academic Career on Track: What's Next for You and How Do You Get There? - **Wang 301**	Getting Started with the SENCER-SALG - **Wang 101**	How to Publish in Sci. Education & Civic Engagement: An International Journal - **Hilton Garden Inn Library**	Engineering for Social Good Panel - **Wang 201**	Restoration of Polluted Aquatic Environments – a Team-Based Research Course - **Wang 102**	
3:3 0 P 4:0 0 P		SENCER Hawai'i - Working Towards Creating Communities of Transformation Integrating Indigenous & Traditional Acad. Knowledge Systems - **Wang 101**	Using SENCER Courses for Research on Teaching - **Hilton Garden Inn Library**	Listening, Developing, Building: Engineering Programs for Girls' Education & Community Development - **Wang 201**	Vulnerable Populations and the STEM Ecosystem: Are Job Security Preferences and Risk Aversion Driving STEM Major Choice? - **Wang 102**	
4:3 0 P 5:0 0 P 5:3 0 P	Poster Reception (4:30-6:00pm) - **Hilton Garden Inn University Ballroom**					

Time	Saturday, August 5, 2017						
7:0 0 A 7:3 0 A 8:0 0 A	Breakfast - **East Side Dining**						
8:3 0 A 9:0 0 A 9:3 0 A	Myles Boylan, Rick Moog, and Karen Oates Plenary Panel (8:30am - 10:00am) - **Wang Theater**						
10:0 0 A 10:3 0 A	Creating Inclusive, Diverse Organizations Using the Intercultural Development Continuum - **Wang 301**	SENCER and Graduate Ed, Part 1 - **Wang Lecture Hall 1**	Capturing Eclipse Excitement: Illuminating The Sun With STEM - **Wang 102**	Active Learning - **Wang 101**	Panel Session - Different SALG Contexts (longitudinal, institutional) - **Wang Lecture Hall 2**	Integrating Social & Environmental Theme-Based Projects in Elem. Statistics - **1310 Comp Sci** DC Trinity Students Discover How Climate Change Impacts Women & Children Around the Globe - **1310 Comp Sci**	SENCER Cafe - **Wang Lobby**
11:0 0 A 11:3 0 A		SENCER and Graduate Ed, Part 2 - **Wang Lecture Hall 1**	Cooking Up Science - **Wang 102**	Creating a Student-Centered Class - **Wang 101**	Civic Engagement & Collaborative Research- **Wang Lecture Hall 2** Teaching with Radiation: Can Using A Taboo Subject Matter Aid Learning? - **Wang Lecture Hall 2**		
12:0 0 P 12:3 0 P 1:0 0 P	Lunch (12:00-1:30pm) - **East Side Dining**						
1:3 0 P 2:0 0 P 2:3 0 P 3:0 0 P	David Asai Plenary Address (1:30 - 3:30 P) - **Wang Theater**						
3:3 0 P 4:0 0 P	Strategic Conversations - **Wang 301**	Group Cluster Session - Applied Uses of SALG - **Wang 101**	Coupling Civic Engagement with Social Supports to Retain Minority Students in STEM - **Wang Lecture Hall 2**	Assessment Matching Real and Ambitious Goals - **Wang Lecture Hall 1**	Progress in the TWU Pollinator Garden after Two Years - **Wang 102** My Yard, Our Sound: A New Look In The Garden Improves Water Quality and Biodiversity - **1310 Comp Sci**		
4:3 0 P 5:0 0 P			NYP Helmsley Project at Suffolk County Community College - **Wang Lecture Hall 2**	Using Reflection & Entrepreneurial Mindset Learning to Promote Intentional Learning Paths - **Wang Lecture Hall 1**	Undergrad Research & Civic Engagement- **Wang 102**	Coding in English - **1310 Comp Sci** TWU Pioneer Research at the Mall - **1310 Comp Sci**	
5:3 0 P 6:0 0 P 6:3 0 P	Dinner Recognizing Achievements in the NCSCE Community (5:30-7:00pm) - **Wang Zodiac Lobby**						

Time	Sunday, August 6, 2017					
7:00 A 7:30 A 8:00 A	Breakfast - **East Side Dining**					
8:30 A 9:00 A 9:30 A	Katayoun Chamany Plenary Address (8:30am - 10:00am) - **Wang Theater**					
10:00 A	Leading Change through Purpose - **Wang Lecture Hall 1**	Managing Difficult Conversations in the Sciences - **Wang 101**	Campus as a Living Laboratory for Sustainability: Energy, Food, and Trash - **Wang Lecture Hall 2**		Connecting Indigenous and Western Knowledge in a Time of Crisis - **Wang 102**	SENCER Cafe -**Wang Lobby**
10:30 A					Implementing SENCER at Trinity Washington University - **Wang 102**	
11:00 A 11:30 A 12:00 P	Brunch (11-12:30pm) - **East Side Dining**					
12:30 P 1:00 P 1:30 P	Team Time, Regional Meetings (12:30- 2:00pm)					
2:00 P 2:30 P	Leveraging Civic Engagement in Upper Level Courses: Introducing the "Microbiology of Urban Spaces" - **Wang 101**	Strategies for Improving Group Work and Engagement in STEM Classrooms - **Wang Lecture Hall 2**	Integrating Science and Social Justice in Our Lives: A Five-Phase Structured Dialog - **Wang Lecture Hall 1**	Using Hands-On Learning Activities in the Collegiate Science Classroom - **Wang 301**		
3:00 P	Dumbing It Up: How Public Information About Drinking Water Quality Can Be Made More Accessible To The Public - **Wang 101**	Documenting Achievements: How to Use Portfolios as a Professional Development Tool - **Wang Lecture Hall 2**	Implementing Peer-Led Research Activities in Computer Science: The Peer Enhanced Experiential Research in STEM (PEERS) Project at Northeastern Illinois University - **Wang Lecture Hall 1**	So, What Do I Do?: Games and Curriculum for SENCER Courses - **Wang 301**	Developing a College Undergraduate Research Certificate - **Wang 102**	
3:30 P					Application of Project Based Learning through Campus Prairie Restoration - **Wang 102**	
4:00 P	Institute Adjournment (4:00 - 4:30pm) - **Wang Theater**					

THURSDAY, AUGUST 3RD

All sessions will be held on the Stony Brook University Campus.

8:15 A.M. – 4:00 P.M. **SSI 2017 CHECK-IN**
Wang Center Lobby

All SSI 2017 participants and facilitators should check in with SSI staff upon arrival at Stony Brook University's Wang Center to receive SSI materials, including printed copies of the SSI program, name badges (which are required for access to SSI meals and events), a bag, and a reusable mug for both hot and cold drinks.

8:30 A.M. – 3:30 P.M. **EXCELLENCE AND DIVERSITY IN ENGINEERING EDUCATION: ACADEMIA, INDUSTRY AND GOVERNMENT**
Wang Center Room 301

This Workshop is by invitation only.

10:00 A.M. – 1:00 P.M. **SCI CO-DIRECTOR MEETING**
Wang Center Room 201

This meeting for SENCER Center for Innovation Co-Directors is by invitation only.

1:00 P.M. – 4:00 P.M. **ADVISORY GROUP MEETING**
Wang Center Room 201

This meeting is by invitation only.

2:00 P.M. – 3:30 P.M. **IMLS PARTNER MEETING**
1310 Computer Science

This meeting is by invitation only.

4:30 P.M. – 6:30 P.M. **SSI 2017 OPENING PLENARY SESSION**
Wang Center Theater

Welcome to the 2017 SENCER Summer Institute
Eliza Reilly, eliza.reilly@stonybrook.edu
Executive Director
National Center for Science and Civic Engagement

Introduction of President Stanley
David Ferguson, david.ferguson@stonybrook.edu
Distinguished Service Professor and Chair, Technology and Society
Associate Provost for Diversity and Inclusion
Stony Brook University

Welcome to Stony Brook University
Samuel Stanley, samuel.stanley@stonybrook.edu
President
Stony Brook University

Introduction of Dean Sotiropoulos
David Ferguson, david.ferguson@stonybrook.edu
Distinguished Service Professor and Chair, Technology and Society
Associate Provost for Diversity and Inclusion
Stony Brook University

Plenary Presentation: The Role of Educational Institutions in Developing Civic Capacity and Awareness in STEM Learning
Fotis Sotiropoulos, fotis.sotiropoulos@stonybrook.edu
Distinguished Professor and Dean of Engineering and Applied Sciences
Stony Brook University

Aims for SSI 2017
Eliza Reilly, eliza.reilly@stonybrook.edu
Executive Director
National Center for Science and Civic Engagement

THURSDAY, AUGUST 3

6:30 P.M. – 8:00 P.M. **SSI 2017 GALA WELCOME DINNER**
Wang Center Zodiac Lobby

FRIDAY, AUGUST 4TH

Sessions will be held on the Stony Brook University Campus and at the Hilton Garden Inn Stony Brook.

7:00 A.M. – 8:30 A.M. **BREAKFAST**
University Ballroom, HIlton Garden Inn

8:30 A.M. – 10:00 A.M. **ALL-INSTITUTE PLENARY SESSION II**
University Ballroom, HIlton Garden Inn
Eliza Reilly, Presiding

Plenary Presentation: Writing Education in the STEM Disciplines
Elyse Eidman-Aadahl, elyseea@nwp.org
Executive Director
National Writing Project

10:10 A.M. – 12:00 P.M. **SESSION BLOCK I**

A NOTE ON THE SSI 2017 SESSION BLOCKS

In order to provide you with a more customizable experience at SSI, we have put together several session blocks, during which sessions of different lengths will run concurrently. This approach to scheduling emerges from feedback from past symposia evaluation and from conversation with many members of the community.

The two-hour workshop sessions will provide newcomers with an introduction to basic elements of the SENCER approach, provide alumni with opportunities to apply the SENCER approach to new challenges, and provide workshop-style training on active-learning pedagogies and appropriate assessment.

The 50 minute sessions will allow members of the SENCER community to share targeted learning opportunities about their work and will give participants takeaways applicable at their home institutions.

The 20 minute presentation sessions will be reports from the field by alumni and guests intended to facilitate the generation of new ideas and spark new connections.

All sessions are timed to allow 10 minutes of time between each, during which you can move to the next activity.

There are no repeat sessions, though there are multiple sessions that pursue any particular theme. We recommend that teams split up to assure broad exposure to the offerings in each session block.

A NOTE ON THE SSI 2017 PROGRAM FOCUSES

In order to help you identify sessions that fall into particular areas of focus for our program, we have established program focuses. Though not all sessions have focuses, those that do are designated with shading under their location.

1. Teaching and Learning – Core sessions on course design and research and evidence-based approaches to learning

2. Academic Leadership Development – Sessions on advancing institution-wide change and aligning the SENCER approach with your personal and institutional goals

3. Community Collaborations – Sessions about SENCER work done in concert with local communities and partnering organizations, such as libraries, museums, and science centers

4. SENCER Across the Curriculum – Sessions about courses and programs that combine aspects of both STEM and Humanities courses

5. New Contexts for SENCER - Sessions about projects and initiatives that represent an expansion of SENCER into contexts such as K-12 education, graduate education, and citizen science projects

10:10 A.M. – 11:00 A.M. **CONCURRENT SESSIONS**

Expanding SENCER Principles to K-12 Educational Settings

Wang Center Room 201

Focus: New Contexts for SENCER

Kathy Browne, browne@rider.edu
Rider University

Jeff Hoagland, jhoagland@thewatershed.org
The Watershed Center - Stony Brook-Millstone Watershed Association

Missy Holzer, mholzer@monmouth.com
Chatham High School

Jessica Monaghan, jessica_monaghan@nbpsbj.net
New Brunswick Public Schools

During the spring of 2017, two teams consisting of a K-12 educator and an informal educator worked to create a learning sequence for teachers that is aligned to the Next Generation Science Standards (NGSS), including the engineering design process. The focus was to teach science by addressing local civic issues. Following a summary of the synergies between the K-12 NGSS and SENCER ideals, the classroom teachers and informal science educator partners will summarize lesson sequences for middle and high school students that explore local environmental issues. Examples will include both urban and suburban settings. Characteristics of various aspects of partnerships that enabled the project to succeed will also be summarized. Student work examples will be available to review and discuss. This project is generously supported by a grant from Institute of Museum and Library Services (IMLS) to Stony Brook University as part of the SENCER-ISE Partnership Champions project.

Evidence of Student Learning and Change
Hilton Garden Inn Library
Focus: Teaching and Learning

Matt Fisher, matt.fisher@stvincent.edu
Saint Vincent College

Evidence is central to a wide range of activities that SENCER faculty engage in, including assessment, promotion and tenure, grant-seeking, and scholarship of teaching and learning. But many faculty may not be familiar with the full range of forms of evidence that we can draw on related to student learning and impacts of the SENCER approach on students. This session is designed to survey a wide range of forms of evidence – quantitative and qualitative, direct and indirect – ranging from student work on exams and assignments (and some thoughts on how to design those to function better as evidence) to the use of rubrics to coding to surveys like the SALG to focus groups. Participants will be pointed towards resources they can explore at greater depth on their own. As part of the session, each participant will be provided time to think about their particular context/need and next steps they could take in regards to evidence for their particular situation (such as assessment, personal scholarship, or promotion/tenure).

A Hands-On Course Series Designed to Engage Students in Unique and Important Research
Life Sciences Building Greenhouse - Basement Level

Sharon Pochron, sharon.pochron@stonybrook.edu
Stony Brook University

This session will teach participants about a back-to-back series of student-run courses where undergraduates get to design, implement and communicate a unique project of their choosing in ecotoxicology. During the first semester (EHI 350) students decide on a project and set it up; during the second semester (EHI 351), students collect and analyze the data, and they then publically communicate their findings. The students decide as a group which toxin they will investigate and the methods they will use to do so. The course covers literature reviews, hypothesis formation, implementation of a research project, data collection, and write-up. Past projects have involved the effects of acid rain, heavy metals, herbicides, and plastics on organisms such as soil microbes, plants and earthworms. Students are encouraged but not required to enroll in both EHI 350 and 351, which are offered in consecutive semesters. All projects are conducted with an eye towards publication in peer-reviewed journals. Oral communication of their project to the public is required. This process, begun in 2015, has led to a publication in the journal Chemosphere, several honors projects, and a handful of additional publications currently in review.

Thinking and Talking About Re/Designing a SENCER Course
Wang Center Room 301
Focus: Teaching and Learning

Monica Devanas, devanas@ctaar.rutgers.edu
Rutgers University

Linden Higgins, lindenhiggins@gmail.com
Education for Critical Thinking

This is an introduction to the SENCER approach for designing or re-designing courses in the SENCER style. What are civic issues of interest to you?.....to your students? …..to your community? We will start with that thought and we will consider how to move from ideas about capacious unanswerable problems to linking your disciplinary content to understanding, explaining and generating answers that engage and motivate students.

This session will consider the core elements of what makes a SENCER course - (1) it begins by taking into account the interests and motives that students and faculty bring to it, (2) is framed within a complex, unsolved question of civic consequence, (3) helps students learn key content, processes and skills in one or more disciplinary tradition, (4) carefully matches pedagogy to learning objectives, (5) encourages discovery of new knowledge or new connections on the part of the student, (6) enables a student to identify and practice what to do, as a conscientious citizen in a democracy, with this new knowledge, and (7) prepares a student for future self-directed learning and responsible action.

The SENCER approach has been successful in both general education and in majors courses, making STEM content relevant for student learning. The mission of SENCER is to develop the knowledge, skills and attitudes of students by teaching "through" the lens of wicked, real-world problems, which sustains and motivates students and faculty. Join the discussion with SENCER practitioners and see if you can SENCER-ize your courses and teaching.

10:10 A.M. – 10:30 A.M. **PRESENTATION SESSION**

A WAC-y Project: How Writing Across the Curriculum (WAC) Made Civic Engagement Even Better
Wang Center Room 101
Focus: SENCER Across the Curriculum

Gillian Backus, gbackus@nvcc.edu
Northern Virginia Community College

In Fall 2016, a collaboration began between an English professor and a Biology professor to improve communication about civic engagement with students. The partners worked together to create a grading rubric to use when assessing student civic engagement projects. In the Spring of 2017, work continued on the project to improve the quality and clarity of the assignment background itself. This session will briefly describe this collaboration, discuss its many benefits, and pitfalls, and discuss some of the student projects that resulted from the changes implemented.

10:40 A.M. – 11:00 A.M. **PRESENTATION SESSION**

The Evolution of a Music and Science Course
1310 Computer Science

Paula Bobrowski, bobrope@auburn.edu
Nancy Haak, haaknan@auburn.edu
Robert Holm, rholm@auburn.edu
Ann Knipschild, knipsak@auburn.edu
Aurora Weaver, ajw0055@auburn.edu
Auburn University

This session will illustrate how an undergraduate course, "Music and Science," (part of our university's core curriculum) evolved across three successful NSF Post-Institute Awards led by faculty members across three different disciplines (music, speech language pathology, and audiology). Each discipline addressed a distinct aspect of music's influence on our lives and offered means by which to gauge such influence, such as measures of well-being (HR & GSR), relative levels of brain activity (QEEG), and motor learning. The contributions extended across the lifespan from young children's developing auditory and motor systems to the aged populations with dementia, who may be inspired by music to move, communicate and recall. Each contributing faculty speaker will offer a brief summary of how students participated in such measurements, how they learned each measure's contribution to quality of life, and how the students engaged with surrounding communities to share their experience and knowledge. Attendees will then be invited to share, question, and discuss related topics and consider collaborative alternatives for future experiences employing SENCER principles.

11:10 A.M. – 12:00 P.M. **CONCURRENT SESSIONS**

Next Generation Science Standards: The Roles and Responsibilities of STEM Faculty in the Preparation of K-12 Teachers
Wang Center Room 201
Focus: New Contexts for SENCER

Jay Labov, jlabov@nas.edu
National Research Council

The Next Generation Science Standards (NGSS) were developed from an evidence-based framework produced by the National Academies of Sciences, Engineering, and Medicine. Since their release in 2013, the NGSS have been adopted by 19 states and the District of Columbia. Other states have adopted them in whole but have given them different names. Still others are adopting selected portions of the standards. The NGSS offer a new vision for teaching and learning science in Grades K-12. For example, they emphasize scientific practices and cross-cutting concepts in addition to disciplinary knowledge, integrate engineering and technology into K-12 science more than ever before, and suggest learning progressions for scientific concepts. These new emphases in K-12 science have enormous implications for how to assess knowledge as well as for teacher professional development and teacher preparation.

This session will provide an overview of the NGSS and their implications for STEM faculty in higher education in preparing the next generation of science teachers. Group discussion will focus on ways in which civic engagement and SENCER's approaches to teaching and learning may also be applicable to pre-service education for teachers of STEM.

Beyond Assessment: Designing Informative Evaluations of Student Learning
Hilton Garden Inn Library
Focus: Teaching and Learning

Linden Higgins, lindenhiggins@gmail.com
Education for Critical Thinking

Many faculty are deeply interested in knowing whether their teaching strategies are having impacts on student learning. Detecting impacts is the focus of program evaluation, and this session introduces the basic concepts of designing an evaluation. Following a presentation of how evaluation is distinct from research, there will be a white-board collaborative mapping of resources, outputs, and desired impacts for a hypothetical course activity. Based on this model, the group will identify and discuss possible evaluation questions, considering factors such as generality, context, and foundational questions in the literature around teaching and learning. After a brief presentation about choosing appropriate indicators, 'triangulation,' and the meanings of validity and reliability in SoTL data analysis, the group will identify possible indicators for the hypothetical program model, and discuss how those might be measured. The session will close with discussion of participants' thoughts of how to proceed with evaluating impact of their SENCER courses.

SENCER and Informal Science Education
Wang Center Room 301
Focus: Community

Marsha Semmel, marsha.semmel@gmail.com
Marsha Semmel Consulting

Dave Ucko, daveucko@gmail.com
Museums+More LLC

In this session, Marsha Semmel and David Ucko, senior advisors to SENCER-Informal Science Education (SENCER-ISE), will provide a brief overview and update on SENCER projects involving partnerships between higher education institutions and informal science education organizations funded by the National Science Foundation, the Institute for Museum and Library Sciences, and the National Endowment for the Humanities. What are the ingredients and indicators of success in higher education/informal science education organization partnerships, and how can such collaboration benefit both sectors? The session will also engage participants in a discussion of relevant trends, research, and impact studies in the ISE sector.

STEM-Humanities Partnerships to Foster Responsible and Global Thinking
Wang Center Room 102
Focus: SENCER Across the Curriculum

Gillian Backus, gbackus@nvcc.edu
Northern Virginia Community College

Marcia Bronstein, marcia.bronstein@montgomerycollege.edu
Carol Moore, carol.moore@montgomerycollege.edu
Montgomery College

Faculty and students at Montgomery College in Maryland and Northern Virginia Community College explore compelling global issues, such as hunger, sustainable energy, and water, through integrated STEM-Humanities curricula. This session presents four replicable models of community college curricula that address global issues through interdisciplinary STEM-Humanities frameworks and content. Participants in this workshop will explore ways to cultivate STEM-Humanities partnerships in their own contexts and will receive tools and handouts to do so. Future initiatives include cultivating a network of STEAM partners in two-year colleges across the D.C. Metro area.

11:10 A.M. – 11:30 A.M. **PRESENTATION SESSION**

The Advantages and Challenges of Using Concept Mapping in Biology Courses at a Community College
Wang Center Room 101

Barbara Berchiolli, bberchiolli@gmail.com
City Colleges of Chicago: Harold Washington College

The typical community college student juggles school, work, and family and has little time to study. Concept mapping is a valuable skill that can help improve productivity and time management for students in this category. It makes a large body of knowledge more manageable to learn. It deepens understanding of the relationship between concepts and it divides knowledge into small segments that are easier to learn and retrieve.
This session will discuss methods devised for introductory biology courses to integrate concept mapping, and efforts to evaluate its impact on student learning. Benefits and challenges of using concept mapping, strategies to construct a concept map, and the use of rubrics to evaluate the impact of the approach on student learning will be shared.

12:00 P.M. – 1:15 P.M. **LUNCH**
University Ballroom, Hilton Garden Inn

1:15 P.M. – 2:15 P.M. TEAM TIME, CONSULTATIONS, AND INITIATIVE MEETINGS

Group Consultations

This year, we will be hosting group consultations on topics of concern to the members of our community as indicated in SSI registrations. These conversations will, we hope, elicit best practices and paths forward for participants on these issues. Because consultations were previously restricted to groups and teams, we also hope this new format will allow individual participants interested in these topics to learn more, and share their experiences.

1. Assessment: *Wang Center Room 301*
2. K-12 and pre-Service Teacher Education: *Wang Center Room 101*
3. Graduate Education: *Hilton Garden Inn Boardroom*
4. Undergraduate Research: *Wang Center Room 102*
5. SENCERizing Campus: *Hilton Garden Inn Library*

Team Time

Teams may find any suitable location on campus to conduct a team meeting.

SENCER-ISE Partnership Champions Meeting
Wang Center Room 201

This meeting is by invitation only.

2:30 P.M. – 4:20 P.M. SESSION BLOCK II

2:30 P.M. – 4:20 P.M. WORKSHOP

Keeping Your Academic Career on Track: What's Next for You and How Do You Get There?
Wang Center Room 301
Focus: Academic Leadership

Karen Kashmanian Oates, koates@wpi.edu
Worcester Polytechnic Institute

So you have been at University X for several years and you're wondering what the next phase in your career might be—a central executive position, a more outward-looking administrative position, or a position that is more balanced between teaching and administration? Successful and fulfilling careers take many forms in the new academy. We will explore options for mid-career academics and the steps that can get you on track for your next position. Together we will explore your strengths, passions and leadership characteristics that will move you forward in advancing your career goals. We will end the session with the creation of a personalized strategic career development plan.

2:30 P.M. – 3:20 P.M. **CONCURRENT SESSIONS**

Engineering for Social Good Panel
Wang Center Room 201

Moderator: David Ferguson, david.ferguson@stonybrook.edu
Stony Brook University

Sherryl Broverman, sbrover@duke.edu
Duke University

Robert Kukta, robert.kukta@stonybrook.edu
Komal Magsi, komal.magsi@stonybrook.edu
Stony Brook University

Many of the pressing global issues and problems of our time, including health, energy and the environment, infrastructure, security, and economic development, have significant scientific and technological dimensions. It is critical to prepare students, regardless of major, to have the inclination and abilities to address these and other areas--within broad social and cultural contexts. Panelists will focus on approaches (Including SENCER) that both include and transcend discipline-specific knowledge to engage students in holistic ways of understanding, planning projects, and applying their knowledge. Special attention will be given to the application of science, technology and engineering for advancing social good within high-needed areas of the U.S. and in developing countries. Panelists will describe courses, curricular projects, and field experiences that are aimed at advancing social good.

Getting Started with the SENCER-SALG
Wang Center Room 101
Focus: Teaching and Learning

Stephen Carroll, scarroll@scu.edu
Santa Clara University

This session will introduce attendees to the SENCER–SALG (Student Assessment of their Learning Gains) and provide instructions on how to use it to assess student learning in their classes. The session will begin with some basic principles of the SENCER-SALG's design and show how understanding those principles will help faculty members use the instrument more effectively. Working directly with the SENCER–SALG website, participants will learn how to set up survey instruments for their own classes, how to administer the surveys, and how to interpret the results. Participants will learn how to customize the instrument to include their own course goals as well as SENCER's programmatic goals. This session is especially geared for those new to the SENCER–SALG. Attendees will become comfortable with the SENCER–SALG and motivated to use it to help them understand in more detail what (and how) students are learning in their classrooms.
Participants will be able to:

- understand basic principles of assessing student learning (especially as they are manifested in the SENCER–SALG),
- use the SENCER–SALG to assess student learning in their classes, and
- customize the SENCER–SALG to include their own course goals as well as SENCER's.

How to Publish in Science Education and Civic Engagement: An International Journal
Hilton Garden Inn Library
Focus: Teaching and Learning

Marcy Dubroff, mdubroff@fandm.edu
Franklin & Marshall College/The POGIL Project

Matt Fisher, matt.fisher@stvincent.edu
Saint Vincent College

Trace Jordan, trace.jordan@nyu.edu
New York University

Do you want to publish a journal manuscript to share your educational innovations with the SENCER community and beyond? This session describes a peer-reviewed online journal that is inspired by the SENCER project and published by the National Center for Science and Civic Engagement. The journal serves as a forum for publishing creative work at the interface of science education and civic engagement. We will provide practical advice for preparing a journal manuscript by focusing on how to translate your educational practice into scholarship on teaching and learning. As part of the session, each participant will identify one idea for developing a journal manuscript, assess how developed the idea is, and identify next steps to move closer to the goal of submitting to the journal.

Restoration of Polluted Aquatic Environments – a Team-Based Research Course
Wang Center Room 102
Focus: Community

Jeffrey Levinton, levinton@life.bio.sunysb.edu
Stony Brook University

This course's objective has been to take a team and collaborative learning approach to studying the components of the environment that are needed to understand the means and potential of restoring the eastern oyster, *Crassostrea virginica*, to Jamaica Bay, New York. In the process students learn about the concept of ecological restoration, the functioning of estuaries, the ecology of oysters and oyster beds, and the interactions between oysters and the seabed and water column.

The course consists of three scientific teams that produce research findings that collectively give a picture of the environment and ecology of an urban body of water. The teams study (a) water quality by collecting data from a cruise trip and analyze large data sets collected by remote sensors by other investigators working in the bay; (b) study oyster performance (feeding and metabolic rate, in clean and impacted waters; (c) the effect of nutrients on primary production in clean and urban-impacted waters. After a few weeks of lectures and two class field trips, the teams meet, present their research plans and then give two more talks on their progress during the semester. At the end there is a major symposium day and the teams present their work, compare their results to past team projects and eventually prepare three research posters for the campus research exposition in the following spring. They also prepare major team-written papers on the three research projects, declaring individual responsibility for the parts of the papers they each write, although the entire team (4-5 students) reads the entirety of a team paper.

The team approach combined with intense lab work and joint presentations quickly bonds students to their groups, giving them a sense of accomplishment while they learn useful skills in the lab, data analysis, oral presentation, writing, and poster preparation.

3:30 P.M. – 4:20 P.M. **CONCURRENT SESSIONS**

Listening, Developing, Building: Engineering Programs for Girls' Education and Community Development
Wang Center Room 201
Focus: Community

Sherryl Broverman, sbrover@duke.edu
Duke University

Deep and sustained learning comes when knowledge is connected to problems students care about. Messy, complicated, real world issues also challenge students to push beyond simple solutions and come face to face with how knowledge is used by different communities. This talk addresses these issues in the context of a long term collaboration between Duke University and WISER, an NGO in Kenya that works with girls to transcend poverty, HIV/AIDS, and gender based-violence. This collaboration arose from a SENCER course and programming. An engineering course at Duke and an engineering club at the WISER secondary school have engaged both groups of students in engineering design challenges to improve the lives of girls in Kenya. Questions raised will be: how do you ensure the cultural needs of the community partner drive innovation and student projects? How do you build mutually respectful community partnerships that ensure authentic learning for students and community development? How do we keep underrepresented groups in STEM beyond an introductory 'humanistic' science course?

SENCER Hawai'i - Working Towards Creating Communities of Transformation Integrating Indigenous and Traditional Academic Knowledge Systems
Wang Center Room 101
Focus: Community

SENCER Hawai'i Team

The SENCER Hawai'i model state team will present recent work of both the overall team and individual team members in addressing the grand challenges of our time throughhigh-impact pedagogical practices, institutional transformation, and collaborative networking. This work is grounded in SENCER principles as well as in the integration of indigenous knowledge in the natural, and social sciences. The presentation will be followed by an open, interactive exchange with session participants about creation of a collaborative network to support professional development for lasting institutional change and community-based partnerships. We are specifically interested in modeling, inspiring, and learning about similar initiatives and collaborations elsewhere that aim at integrating local, indigenous, and traditional practices and ways of understanding into research and inquiry-based learning. This approach makes it it possible connect civic issues to STEM content, encourage the incorporation of different perspectives, push students and faculty to critically analyze preconceptions, and actively engage us all in authentic research.

Using SENCER Courses for Research on Teaching
Hilton Garden Inn Library
Focus: Teaching and Learning

Monica Devanas, devanas@ctaar.rutgers.edu
Rutgers University

Linden Higgins, lindenhiggins@gmail.com
Education for Critical Thinking

As you consider your courses and design or re-design them into the SENCER style, you have very rich opportunities to use the process for developing new areas of research, i.e. research on your teaching. The Scholarship of Teaching and Learning (SoTL) as developed by the Carnegie Foundation, is a systematic inquiry into student learning. But before that level of work is undertaken, faculty need to be thinking ahead and with deliberation. Preparation for SoTL begins with careful attention to current research on teaching and learning, the planning of research question(s), ideas about activities and assessments, i.e. the research, and how that evidence will be used to improve student learning. Finally, one needs to consider how to share that work with the larger community and "go public" with the outcomes.

Participants in this session will consider questions regarding the literature and characteristics of scholarship of teaching and learning; what are the forms of evidence for this form of scholarship; what constitutes a public forum for dissemination of this research. Most importantly, discussion will focus on how SENCER is a useful approach to connect the faculty, students and community with this form of scholarship.

3:30 P.M. – 3:50 P.M. **PRESENTATION SESSION**

Vulnerable Populations and the STEM Ecosystem: Are Job Security Preferences and Risk Aversion Driving STEM Major Choice?
Wang Center Room 102

Jonelle Bradshaw de Hernandez, jonelle.bradshaw@stonybrook.edu
Stony Brook University

The purpose of the session is to discuss whether the entry of vulnerable U.S. populations into the STEM fields are being influenced by risk aversion and/or job security. We will identify current research regarding STEM pathways and career outcomes, explore research in the STEM fields that focus on the motivations of the student learner and to further dissect if job security and risk aversion are variables that influence STEM major, career choice and attrition. Threads will be explored in the areas of socio- economic status and choice, maximization of utility and human potential and return on investments into STEM target efficiency groups.

4:30 P.M. – 6:00 P.M. **POSTER PRESENTATIONS**
University Ballroom, HIlton Garden Inn

Poster abstracts, can be found under the Poster Presentations tab. There will be refreshments served at tonight's reception.

A NOTE ON THE SSI 2017 POSTER PRESENTATIONS
We are pleased to invite you to attend a special poster session that feature the work of SSI 2017 participants. Poster authors will be on hand to share their work, exchange ideas, and answer questions during the designated Poster Presentations time. Posters will be on display on the afternoon of August 4.

SATURDAY, AUGUST 5TH

All sessions will be held on the Stony Brook University Campus.

7:00 A.M. – 8:30 A.M. **BREAKFAST**
East Side Dining

8:30 A.M. – 10:00 A.M. **ALL-INSTITUTE PLENARY SESSION III**
Wang Center Theater
Eliza Reilly, Presiding

Panel: The Origins and Development of Communities of Transformation in Undergraduate STEM Reform

Myles Boylan, mboylan@nsf.gov
Lead Program Director, Division of Undergraduate Education
National Science Foundation

Karen Kashmanian Oates, koates@wpi.edu
Peterson Family Dean of Arts and Sciences
Worcester Polytechnic Institute

Rick Moog, rick.moog@fandm.edu
Executive Director, The POGIL Project
Franklin & Marshall College

10:10 A.M. – 12:00 P.M. **SESSION BLOCK III**

10:10 A.M. – 12:00 P.M. **WORKSHOP**

Creating Inclusive, Diverse Organizations Using the Intercultural Development Continuum
Wang Center Room 301
Focus: Academic Leadership

Yoshiko Chino, yoshiko@dendros.com
Adriana Robertson, adriana@dendros.com
The Dendros Group

A lot of emphasis is placed on recruiting and sustaining minority students. But what about faculty? What are ways to generate a faculty team that values and leverages cultural differences? In this workshop we will explore the meaning and significance of culture, learn about the Intercultural Development Continuum®, and connect these elements with individual and group intercultural competence skills to enhance your work group. You will also leave knowing how to access the Intercultural Development Inventory®, a research validated instrument.

For the cost of the instrument ($25), you can have a one-on-one consultation on your own individual Intercultural Development Inventory®, or IDI® profile. In this consultation session, you will learn how you personally navigate culture, what you can do as a leader to improve your intercultural capacities, and how to help generate a culture that supports and leverages diverse experience and perspectives. We are offering both immediate onsite and future remote appointments. Limited to first 12 people! Email adriana@dendros.com for more information.

10:10 A.M. – 11:00 A.M. **CONCURRENT SESSIONS**

Panel Session - SALG in Context
Wang Center Lecture Hall 2
Focus: Teaching and Learning

Moderator: Stephen Carroll, scarroll@scu.edu
Santa Clara University

So you've used SALG to collect data about what your students are learning in your classes. Now you have a pile of data. What does it mean? How should you analyze it? What can you do with the data? How can you use it to guide changes to your courses? What questions should you ask to deepen your understanding or help you make better decisions? In this panel presentation, experienced SALG users will answer some of these questions based on their own projects. One panelist has used SALG for many years to collect data longitudinally about individual courses he teaches; one uses SALG to collect data at the departmental level; and one has begun the process of using SALG data to evaluate the effectiveness of General Education courses and support procedural change at the institutional level. This is the first of a two-part series: in this session, panel members will share their experiences using SALG data and allow participants to ask questions. In part 2, participants will develop their own SALG instruments or analyze their SALG data in a workshop facilitated by the SALG panel members from session one.

Capturing Eclipse Excitement: Illuminating The Sun With STEM
Wang Center Room 102
Focus: New Contexts for SENCER

Judy Beck, jbeck@unca.edu
Susan Reiser, reiser@unca.edu
Cathy Whitlock, whitlock@unca.edu
UNC Asheville

Excitement and wonder generated by the solar eclipse (coming to a sky near you on August 21, 2017) provide an excellent opportunity to engage students and teachers in STEM concepts and skills related to the topic of the Sun. In this 50-minute hands-on workshop, Judy Beck, Cathy Whitlock, and Susan Reiser will review the highlights and challenges of a K12 professional development workshop they have developed, and share their plans for adapting aspects of the workshop for their college classes in the fall. Project-based learning materials for physics, astronomy, math, and engineering will be presented and made available for participants.

Active Learning
Wang Center Room 101
Focus: Teaching and Learning

Robert Sieg, rsieg@yhc.edu
Young Harris College

For many early-career faculty, there is an abrupt and difficult transition from building mastery of a particular scientific discipline during graduate school to developing as an effective educator. A lack of teaching experience or pedagogical training, resistance from senior faculty and administrators who are averse to change, balancing teaching and research expectations, and minimal time for course development can be intimidating. Despite a wealth of peer-reviewed support for student-centered classrooms, authentic research, and experiential learning, new faculty can default to teaching as they were taught, which could invoke an approach with minimal engagement that may hinder student development.
We will use a mixture of in-class activities and discussion to examine the foundations of active learning that may seem foreign to early-career faculty. Topics include social constructivism, collaborative learning environments, and novel assessment techniques. We will also evaluate peer-reviewed support for these practices that can be used to generate enthusiasm for course redesign within your department.

SENCER and Graduate Education, Part 1
Wang Center Lecture Hall 1
Focus: New Contexts for SENCER

Jay Labov, jlabov@nas.edu
Layne Scherer, lscherer@nas.edu
National Research Council

Robert Seiser, rseiser@roosevelt.edu
Roosevelt University

As SENCER has matured, it has expanded from its original scope of promoting civic engagement in non-majors science courses and now includes many facets of STEM education and faculty development. Participants in this two-part workshop will examine aspects of the future of graduate-level education, an area in which SENCER has not been substantively involved to date, but which could be a potentially important arena for the development of SENCER approaches. These sessions will explore the intersection of scientific inquiry, civic responsibility, and professional development found in STEM education at the masters and doctoral level. Continuing a conversation from last year's SSI, the first session will address the degree to which civic engagement can and should be included as a professional development component in graduate programs and how SENCER-based institutions might influence graduate education through hiring practices and the professional development that they provide to new faculty. The second session will be a working meeting, in which attendees will devise ways to help those responsible for graduate education to think more seriously about training civically responsible research professionals - the SENCER faculty of the future. Current graduate students, faculty and administrators are welcome to attend one or both sessions. Both sessions also will help to inform an ongoing study, Revitalizing Graduate STEM Education for the 21st Century, by the National Academies of Sciences, Engineering, and Medicine. Part 2 of this workshop will be held directly after part 1.

10:10 A.M. – 10:30 A.M. **PRESENTATION SESSION**

Integrating Social and Environmental Theme-Based Projects in Elementary Statistics
1310 Computer Science

Mangala Kothari, mkothari@lagcc.cuny.edu
LaGuardia Community College, NY

Using a new instructional approach or re-designing a course's curriculum could be a difficult task, especially when students need to master the basic disciplinary content within the time frame of the semester. LaGuardia faculty took up the challenge of enriching an Elementary Statistics course to make it more engaging and relevant to students' out-of-class experiences, while maintaining focus on the explicit course contents and objectives. To that end, the Elementary Statistics course was redeveloped by incorporating several learning modules. These modules encompass a variety of key topics from both descriptive and inferential statistics, including data collection and representation, fundamentals of probability, linear correlation and regression analyses, and hypothesis testing. The course modules were offered to students in Elementary Statistics class during two semesters each in 2015 and 2016. This effort was part of NCSCE's Engaging Math Program, supported by the NSF, which began in January 2014
This presentation will highlight the summary of our study and the results of students' learning gains that were measured using the SALG course surveys. The presentation will also share experiences of designing and piloting these modules, in particular, the benefits and challenges of integrating comprehensive critical thinking projects into the course.

10:40 A.M. – 11:00 A.M. **PRESENTATION SESSION**

DC Trinity Students Discover How Climate Change Impacts Women and Children Around the Globe
1310 Computer Science

Mahshid Khavari, khavarim@trinitydc.edu
Trinity Washington University

The topic of climate change, with an emphasis on the impact on women and children in developing countries, has gained popularity and attention at Trinity, a historic women's college located in the heart of Washington, DC. Class ENVS 101 - "Discovering Planet Earth" provides an introduction to climate change for non-science majors. Following an introductory unit on the Science of Climate Change, supplemental textbook readings including, but not limited to, excerpts from Pope Francis's Encyclical on Climate Change and Inequality and recent policy reports (namely: Children and Climate Change by The Woodrow Wilson School of Public and International Affairs at Princeton University and The Brookings Institute; Women and Climate Change-Impact and Agency in Human Rights, Security, and Economic Development by the Georgetown Institute for Women, Peace and Security; A New Climate for Peace-Taking Action on Climate and Fragility Risks, an independent report commissioned by the G7).

One of the core projects for this class includes either individual students or small student groups researching effects of climate change on women and/or children in a developing country of their choice. For example, one student recently undertook a project to research deforestation in Ghana and teach her findings to artistic inner-city high school students in Washington, DC. Next, she hopes to bring them to Ghana to develop art related to this topic to present at an art venue in the Metro DC area. The goal of this project will be to support students in learning, then teaching, their experiences through poster presentations, including personal impressions of how their discovery of climate change on women and children affected their learning and desire to make change.

11:10 A.M. – 12:00 P.M. **CONCURRENT SESSIONS**

Cooking Up Science
Wang Center Room 102
Focus: New Contexts for SENCER

Autumn Marshall, autumn.marshall@lipscomb.edu
Lipscomb University

Ginger Reasonover, ginger.reasonover@lipscomb.edu
Lipscomb Academy Elementary School

The Green Team at Lipscomb Academy Elementary School is an after-school science education program for students in grades K-2. Older elementary school students (grades 3 and 4) are selected to serve as role models of exploration for younger students. The team covers a host of science principles through food and cooking: physics, biology, chemistry, and environmental science, in particular. Food and/or cooking can be used to teach the science basics of the rock cycle, states of matter, layers of the earth's crust, temperature, the butterfly life cycle, suns and comets, aquifers, and sustainability. This session will be a hands-on presentation of these food science projects to allow participants to explore ideas for both formal and informal science education, as well as to provide networking and collaboration potential for K-12 educators.

Creating a Student-Centered Classroom
Wang Center Room 101
Focus: Teaching and Learning

Robert Sieg, rsieg@yhc.edu
Young Harris College

In this follow-up workshop to "Active Learning," common challenges associated with implementing a student-centered course will be addressed. Participants will, compare formative and summative assessment strategies, and use backwards design to create a student-centered lesson plan that will be shared. This workshop should provide hands-on practice with new pedagogical techniques that are tailored to participants' individual specialties.

SENCER and Graduate Education, Part 2
Wang Center Lecture Hall 1
Focus: New Contexts for SENCER

Jay Labov, jlabov@nas.edu
Layne Scherer, lscherer@nas.edu
National Research Council

Robert Seiser, rseiser@roosevelt.edu
Roosevelt University

This second session, a follow-up to "SENCER and Graduate Education Part 1," will be a working meeting, in which attendees will devise ways to help those responsible for graduate education to think more seriously about training civically responsible research professionals - the SENCER faculty of the future. Current graduate students, faculty and administrators are welcome to attend one or both sessions. Both sessions also will help to inform an ongoing study, Revitalizing Graduate STEM Education for the 21st Century, by the National Academies of Sciences, Engineering, and Medicine.

11:10 A.M. – 11:30 A.M. **PRESENTATION SESSION**

Civic Engagement and Collaborative Research: Addiction, Involving Students in a Multidisciplinary, Multi-Institutional Healthy Neighborhoods Project
Wang Center Lecture Hall 2
Focus: Community

Irene Dabrowski, dabrowsi@stjohns.edu
Marilyn Dono-Koulouris, donokoum@stjohns.edu
Robert Fanuzzi, fanuzzir@stjohns.edu
Roberta Hayes, hayesr@stjohns.edu
St. John's University

Starting in the 2016 academic year, students and faculty at St. John's University were invited to participate in a community health research survey, as part of a collaborative research effort with the Staten Island Performing Provider System (SIPPS) and the Director of Health and Wellness for the Staten Island Borough President's Office in New York City. SENCER faculty and their students were key to the implementation of this new civic engagement project. During the first semester of participation, students from the liberal arts and sciences collected data from local community partners utilizing the CDC's vetted Healthy Communities Program "CHANGE" survey tools, i.e. Community Health Assessment and Group Evaluation. Students participating in Academic Service-Learning (AS-L) in four different courses were able to directly interact with various community sectors, gather survey data and experience "research" and civic engagement from a different perspective, including various pitfalls.

In the following semester, a more active involvement with community health issues was attempted. In conjunction with the goal of building healthy neighborhoods through civic engagement and education, there is a need for younger residents' input on drug, alcohol and tobacco addiction problems. In the spring 2017 semester, students from the Scientific Inquiry Core at St. John's University partnered with an Introduction to Sociology class to address Addiction issues in Staten Island, NY and its effect on the Health of Neighborhoods. Groups of students investigated the issues associated with substance abuse and the overall effects on both an individual's health as well as the community/neighborhood health. Students in the First Year Seminar/Discover New York classes also looked at the drug problem in NYC, especially on Staten Island, through a leadership project, studying how drug abuse can affect neighborhoods and how civic leadership might propose solutions and programs to address that issue.
Our presentation and discussion will focus on approaches to engaging young people civically and emotionally with community partners and neighborhood health issues, using addiction as a focal point.

11:40 A.M. – 12:00 P.M. **PRESENTATION SESSION**

Teaching with Radiation: Can Using A Taboo Subject Matter Aid Learning?
Wang Center Lecture Hall 2

Steve Bachofer, bachofer@stmarys-ca.edu
Saint Mary's College of California

Adding X-ray Fluorescence labs is a way of introducing students to a methodology where radiation is safely used. The students are excited to work with X-rays and screen field sites for elements of concern (arsenic, lead, cadmium, etc.). Students become proficient in safe practices and gain insights on field sampling. With a well-designed reflection activity, students are empowered to make decisions based on their data. Community partners received additional data on their property while providing an educational site. Student perspectives are summarized using SALG data. This presentation concludes with insights on how easily this taboo subject lends itself to civic engagement and how it can aid learning.

12:00 P.M. – 1:15 P.M. **LUNCH**
East Side Dining

1:30 P.M. – 3:30 P.M. **ALL-INSTITUTE PLENARY SESSION IV**
Wang Center Theater
Eliza Reilly, Presiding

Plenary Presentation: Race Matters
David Asai, asaid@hhmi.org
Senior Director for Science Education
Howard Hughes Medical Institute

3:40 P.M. – 5:30 P.M. **SESSION BLOCK IV**

3:40 P.M. – 5:30 P.M. **WORKSHOPS**

Strategic Conversations
Wang Center Room 301
Focus: Academic Leadership

Jonathan Bucki, jonathan@dendros.com
The Dendros Group

In the academy, the complexity of change is often daunting, requiring attention to a variety of stakeholders with multiple interests and perspectives. Navigating difficult and strategic conversations is an important skill in leading planning and other change efforts. In this workshop, we will explore a "meta" method for leading productive conversations with individuals and groups that brings order and flow to the experience. Using the Focused Conversation Method, participants will learn how to design conversations to maximize engagement and effectiveness. They will learn how to facilitate challenging and difficult conversations with faculty, administrators and other stakeholders. We will also explore how to anticipate and diffuse useless friction in planning and similar collective processes. This method is useful for groups considering proposals, reflecting on progress, developing planning processes, and engaging around sensitive issues. We will pay particular attention to conversations between faculty and administrators.

Group Cluster Session - Applied Uses of SALG
Wang Center Room 301
Focus: Teaching and Learning

Stephen Carroll, scarroll@scu.edu
Santa Clara University

This workshop aims to help participants develop new SALG instruments, analyze their SALG data, and develop new approaches to deepen their understanding of students' learning in their courses. It builds on yesterday's panel presentation by experienced SALG users. Participants in this session will work in groups under the guidance of yesterday's panelists to develop their data analysis practices and develop new questions and SALG instruments. All are welcome to attend; you do not have to attended this morning's panel to participate in this session.

3:40 P.M. – 4:30 P.M. **CONCURRENT SESSIONS**

Coupling Civic Engagement with Social Supports to Retain Minority Students in STEM
Wang Center Lecture Hall 2

John Meyer, johnnymeyer@utexas.edu
University of Texas at Austin

From 2015 to 2017, The Leona M. and Harry B. Helmsley Charitable Trust partnered with Stony Brook University to fund a project entitled "Coupling Civic Engagement with Social Supports to Retain Minority Students in STEM." Six colleges and universities in the New York City region worked together to marshal support services, create learning communities, and focus learning around civic problems. Educators adopted novel and diverse strategies for implementing their reforms in the face of institutionalized obstacles, and overcame student tendencies that make forming learning communities especially difficult. Our short paper presentation and panel discussion will focus on the successes and challenges of implementing the reforms, with a particular emphasis on the point of view of the educators who either worked directly with students or organized their fellow teachers.

Assessment Matching Real and Ambitious Goals
Wang Center Lecture Hall 1
Focus: Teaching and Learning

Frank Wattenberg, frank.wattenberg@mac.com
United States Military Academy

In the video “Assessment: The Silent Killer of Learning” on the physicist Eric Mazur's website, he makes a compelling argument that the most commonly used student assessments (for grading) focus on the lowest order learning goals and subvert attempts to achieve higher order learning goals. This session will build on this idea. The Department of Mathematical Sciences at West Point is planning a pilot story in several sections substituting 10-12 “weekly assessments” for the final exam and midterms. These weekly assessments will test success against higher order learning goals and are based on two key enabling ideas. First, students will have full use of technology on the assessments and, second, the assessments will have an individual and a collaborative component. Each individual student's score will be based in part on his or her individual work and in part on his or her team’s work.
This session will look at several examples of the questions which will be asked and at how technology will be used to facilitate rapid feedback and grading of student work. Although the pilot study is in the first semester of the core mathematics sequence taken by the vast majority of cadets at West Point, the ideas developed apply to many other disciplines. We hope that this will be a first step toward a wider project involving students in many STEM courses.

3:40 P.M. – 4:00 P.M. **PRESENTATION SESSION**

Progress in the TWU Pollinator Garden after Two Years
Wang Center Room 102

Cynthia Maguire, cmaguire@twu.edu
Texas Woman's University

A group of Texas Woman's University (TWU) faculty have worked together to plan and implement a pollinator garden project as an academic teaching tool on our campus. This garden is not maintained by our campus landscape staff, but rather by faculty and student volunteers. It is a true citizen science project allowing our students to learn about plant-pollinator relationships using plants native to our area in Texas which are also drought tolerant. Planning began in early 2015; visible changes in the ground commenced in fall 2016.

There are many reasons for increasing concerns about failing support for biodiversity in our ecosystems. The project involves the transformation of certain areas on campus from lawns, which require significant water, fertilizer and maintenance, into a set of sustainable pollinator gardens that will create habitat for insects and birds which underlie the biodiversity in all ecosystems. These will also be places of beauty for humans to refresh themselves. The plants in these gardens will require very little added maintenance, thus reducing pollution from pesticides and fertilizers. Because they are also drought tolerant, water consumption will also be significantly lower once the beds are established.

This presentation will detail the progress and perils encountered to date, along with practical tips for others who may want to implement gardens on their campuses.

4:10 P.M. – 4:30 P.M. **PRESENTATION SESSION**

My Yard, Our Sound: A New Look In The Garden Improves Water Quality and Biodiversity
1310 Computer Science
Focus: Community

Lauren Hubbard, lhubbard@maritimeexplorium.org
Maritime Explorium

The goal of this Long Island Sound Future Fund project is to foster a sense of responsible ownership of the ecological health of the Long Island Sound through transformations of home landscaping using native plants. The project is a call to action and a mentored response to addressing the problem of pollution and degraded wildlife habitats and water quality. It creates greater numbers of green spaces in our community, an essential activity for the sustainability of our natural shoreline area. The team will report on the methods and rationales for how we help families understand the complex role that native plants do and can play in our region, and how we help them begin their home garden restorations. We welcome an interactive audience and questions.

4:40 P.M. – 5:30 P.M. **CONCURRENT SESSIONS**

Undergraduate Research and Civic Engagement: Current Developments and Future Prospects
Wang Center Room 102

Jay Labov, jlabov@nas.edu
National Research Council

Cathy Middlecamp, chmiddle@wisc.edu
University of Wisconsin-Madison

Efforts to improve education in STEM is increasingly focused on the use of discovery-based undergraduate research experiences (UREs). These may involve students in all phases of a research project to generate new knowledge or improve on some scientific or engineering process. Are UREs effective in enhancing student learning? If so, in what ways?

In recent years the National Academies of Sciences, Engineering, and Medicine (NASEM) has sought to answer this question, exploring the nature and evidentiary basis of the effectiveness of UREs in enhancing student learning, understanding of the processes and nature of science, and personal identification with STEM. During this session Jay Labov will provide an overview of NASEM's work on these issues. Cathy Middlecamp will then offer examples of research experiences for students with a broad ranges of interests and backgrounds, all which include some aspect of civic engagement. As a group, we will then explore how 1) an emphasis on civic engagement might provide new ways of framing and organizing UREs and 2) how SENCERized courses might be developed, modified, or expanded to offer such experiences to students. SSI participants who have developed courses or other programs that currently offer UREs are encouraged to attend and share their knowledge and perspectives.
Those who wish to explore the issues raised during this session in greater depth are encouraged to attend the session offered by Cathy on Sunday morning from 10-10:50 ("Campus as a Living Laboratory for Sustainability: Energy, Food, and Trash").

Using Reflection and Entrepreneurial Mindset Learning to Promote Intentional Learning Paths for Students
Wang Center Lecture Hall 1

Izabela Stroe, izabela@wpi.edu
Worcester Polytechnic Institute

In this session, experiences in increasing the ability of WPI students to maximize their impact on communities by pursuing more intentional educational paths will be shared. To best serve the needs of the world, WPI is committed to providing a unique, experiential undergraduate STEM education and recognizes the need to prepare students more effectively for today's global challenges. One of the key initiatives, known as "Major and a Mission", promotes the use of reflection by students to connect their academic pursuits beyond their major to their co-curricular experiences for a more deliberate career path. In order to achieve this goal several components have been evolving within the university including:

* The KEEN training program through the Kern Family Foundation that provides faculty with the tools to inspire students to develop an entrepreneurial mindset that broadens their horizons and, combined with solid technical knowledge, serves as a powerful catalyst for future success and societal impact.
* The Faculty Learning Community that creates opportunities for students to connect their learning inside and outside the classroom, to draw meaning from their projects and other learning experiences, to track their personal and professional development, and to explore how their values, interests, and life/career direction might guide their choices with a greater sense of purpose.

This session will share experience, best practices, lessons, and perspectives through an interactive section that aligns with SENCER's work on creating more opportunities in our communities of transformation.

NYP Helmsley Project at Suffolk County Community College
Wang Center Lecture Hall 2

Candice Foley, foleyc@sunysuffolk.edu
Suffolk County Community College

Issues affecting Long Island's water supply and quality are the focus of our SENCER themed Helmsley interdisciplinary learning community.

Drinking water is drawn from a sole-source aquifer and the primary means of waste disposal is through individual cesspools/septic tanks particularly in Suffolk County. This project investigates the impact of septic systems on our LI water supply via the lens of four courses; chemistry, journalism, engineering science and construction technology.

These learning communities have explored the issue within each of their classes and exchanged, share resources, and aggregated this information utilizing Blackboard as a central communications tool. This tool linked all four classes, faculty and experts in local groundwater research. Experts in local groundwater, politicians and community leaders as well as our IRACDA post-doctoral Teaching Scholar from SBU will lead online discussions which examine a new septic system currently being piloted which reduces Nitrogen loading.

Students will synthesize scientific information along with economic, societal and renewable energy implications to arrive at a recommendation which will be disseminated and inform the college and regional community via capstone presentations.

4:40 P.M. – 5:00 P.M. **PRESENTATION SESSION**

Coding in English
1310 Computer Science

Jason Schanker, jschanker@molloy.edu
Molloy College

The ability to express solutions to problems in a professional programming language such as Python, Java, or C++ is becoming increasingly important across all disciplines. However, simultaneously learning how to solve problems and the syntax of a new language can be a daunting task for people new to programming. Drag-and-drop block-based languages can be used to eliminate syntax errors, allowing novices to focus on problem solving. However, as documented in the literature, the transition to a standard text-based language can pose a challenge as students may see little similarity between using a friendly English-like block-based language and using a less forgiving professional programming language.

In this talk, we present our newly developed pedagogical tool, Text2Code, and explore ways in which it can be used in conjunction with Google's Blockly to help with this transition in a CS0 course. Specifically, Blockly allows teachers to create their own block-based language, which can generate code in common text-based programming languages such as Python, JavaScript, Dart, and PHP. Text2Code permits the creation of text-based languages, which can be used to generate Blockly code blocks or to be interpreted directly in a language such as Ruby. By using Blockly to allow students to assemble blocks of code of English phrases such as "set x to square root of 16" or "print x + 14" and then using Text2Code to type these same phrases, students can gradually make the transition to a text-based programming language. This research is supported by a Google Education grant.

5:10 P.M. – 5:30 P.M. **PRESENTATION SESSION**

TWU Pioneer Research at the Mall
1310 Computer Science
Focus: Community

Nasrin Mirsaleh-Kohan, nmirsalehkohan@twu.edu
Texas Woman's University

One of the challenges scientists face today is sharing their science with the general public. The main difficulty is a communication barrier. Scientists need to be able to talk about their research and findings in terms that the general public can understand. It is important for public stakeholders to have high regard for science and scientists and appreciate the ongoing research. When the public embraces what happens in the research labs, they will support federally funded research.

At Texas Woman's University (TWU), we held an event "Pioneer Research at the Mall" in Denton to communicate what we do at TWU with the larger community. Through this event, we were able to show people what kind of work and research we do as a way of not only making them aware of our work but to also igniting broader interest in attending TWU. We aimed to improve dialogue between young scientists and the public by having students prepare a more general and non-technical version of their research poster and present it to the Denton community. One result of this event was to show the citizens of our community that they are supporting many great students mostly, women and underrepresented minorities, in their research. The students in turn learn to engage the public as responsible citizens and eventually making the world a better place. In this presentation, we will discuss details of this event, outcomes and response to the surveyed questions.

SATURDAY, AUGUST 5

5:30 P.M. – 7:00 P.M. **DINNER RECOGNIZING ACHIEVEMENTS IN THE NCSCE COMMUNITY**
Wang Center Zodiac Lobby
Eliza Reilly, presiding

All SSI 2017 participants are invited and encouraged to attend. During the dinner, we will bring attention to the leaders of all NCSCE initiatives, as well as SENCER Leadership Fellows, and other honored guests who are joining us for the Institute.

Presentation of the William E. Bennett Award

SUNDAY, AUGUST 6TH

All sessions will be held on the Stony Brook University Campus.

7:00 A.M. – 8:30 A.M. **BREAKFAST**
East Side Dining

8:30 A.M. – 10:00 A.M. **ALL-INSTITUTE PLENARY SESSION V**
Wang Center Theater
Eliza Reilly, Presiding

Plenary Presentation: SENCER and Your Academic Career
Katayoun Chamany, chamanyk@newschool.edu
Mohn Family Professor of Natural Sciences and Mathematics, Chair of the Interdisciplinary Science Program, and Project Shepherd and Director of University Science Labs
The New School

10:10 A.M. – 11:00 A.M. **SESSION BLOCK V**

10:10 A.M. – 11:00 A.M. **CONCURRENT SESSIONS**

Campus as a Living Laboratory for Sustainability: Energy, Food, and Trash
Wang Center Lecture Hall 2

Cathy Middlecamp, chmiddle@wisc.edu
University of Wisconsin-Madison

Teaching and learning in introductory science courses (e.g., chemistry, physics, and biology) connects easily and well to teaching and learning principles related to sustainability. Furthermore, one's own campus provides an almost inexhaustible source of content. For example, the use of energy by a campus, its food supply chain, and its trash provide instructors with opportunities to engage students in learning about sustainability. Equally importantly, topics in campus energy, food, and trash help engage students in learning content in their introductory chemistry, physics, and biology courses. A win-win scenario!

For 20 years, Cathy was on the author team of Chemistry in Context, a project of the American Chemical Society that engaged students in learning chemistry through real-world contexts such as air quality, stratospheric ozone depletion, water, and energy. Five years ago, she began using the real-world context of the University of Wisconsin-Madison campus, connecting campus issues to larger regional and global ones. This presentation tells the stories, both what worked well and what did not. This presentation also will offer resources for instructors who wish to utilize their campus as a "living laboratory."
This session is the sequel to "Undergraduate Research and Civic Engagement: Current Developments and Future Prospects," co-presented with Jay Labov, Saturday, August 5, 4:40 – 5:30 pm.

Leading Change through Purpose
Wang Center Lecture Hall 1
Focus: Academic Leadership

Theo Koupelis, tkoupeli@broward.edu
Broward College

Karen Kashmanian Oates, koates@wpi.edu
Worcester Polytechnic Institute

In this session we will discuss a simple set of steps for leading institutional change through the filter of three different leadership models: power-based, values-based, and servant leadership. Aligning personal and institutional values, setting leadership practices that engage and inspire others, and promoting change through a community of practice, requires a balancing act that is very difficult to accomplish, but even more difficult to sustain. Together we will explore how integrity, values, and professional purpose can sometimes be in conflict, while at other times they can be aligned and foster academic professional fulfillment.

Managing Difficult Conversations in the Sciences
Wang Center Room 101

Catherine Duckett, cduckett@monmouth.edu
Heide Estes, hestes@monmouth.edu
Monmouth University

Linden Higgins, lindenhiggins@gmail.com
Education for Critical Thinking

A core part of the SENCER mission is authentic practice, which includes consideration of diverse viewpoints and the social contexts of scientific research and technical problem solving. However, ethics and diversity are not subjects that we as STEM faculty are especially experienced in handling. Even when we design discussion activities, the conversations may be dominated by a single viewpoint (often aligned with the disciplinary consensus), or a few dominant voices. It can be very difficult to create a safe conversational climate that allows students to take intellectual risks, but our current political polarization suggests that it is even more important than ever to help our students to both think critically, but also to listen patiently to those with whom they disagree. In this workshop, we will present some published research on teaching through controversial issues. We will then facilitate a brainstorming session about strategies to increase respectful yet critical listening by students. We will end with small group work allowing participants to develop activities for their SENCERized courses.

10:10 A.M. – 10:30 A.M. **PRESENTATION SESSION**

Connecting Indigenous and Western Knowledge in a Time of Crisis
Wang Center Room 102

Robert Franco, bfranco@hawaii.edu
Kapi'olani Community College, U. Hawaii

Ulla Hasager, ulla@hawaii.edu
University of Hawaii at Manoa

Outlining some of the many efforts in Hawai'i, this session will explore integration of indigenous and local knowledge with the established sciences to understand and ameliorate capacious, contested, civic issues - to the general benefit of society and to encourage more indigenous students to become leaders in their communities, and enter and succeed in STEM majors and careers.

As islands in Oceania deal with climate change, the University of Hawai'i is implementing a system-wide Sustainability Policy and Plan that brings to the forefront Hawaiian cultural values and knowledge about sustaining productive ecosystems. In May 2017, Kapi'olani Community College approved a Sustainability and Climate Action Plan and the SENCER Hawai'i model state team held a three-day institute, "The Grand Challenges Summer Institute on Water," giving faculty an opportunity to explore and create curriculum integrating indigenous and western knowledge, which also will be at the center of SENCER Hawai'i's work at both local and national levels through the National Center for Science and Civic Engagement's project "Transcending Barriers to Success: Connecting Indigenous Knowledge to Science" over the next three years.

10:40 A.M. – 11:00 A.M. **PRESENTATION SESSION**

Implementing SENCER at Trinity Washington University
Wang Center Room 102

Shizuka Hsieh, siehs@trinitydc.edu
Mahshid Khavari, khavarim@trinitydc.edu
Trinity Washington University

Trinity's College of Arts and Sciences is an all-women's liberal arts college that is a minority-serving institution. Its students mostly come from the low-income neighborhoods of the Washington DC metro area and are typically the first-generation to attend college. Collaboration within our small faculty has generated ten SENCER-related projects, field trips or modules over the past two years, involving disciplines as diverse as Philosophy, Business Administration and Math alongside Environmental Science, Biology and Chemistry. We will present SALG-based assessment of our students' self-perceptions of learning in the courses with SENCER-related projects/modules, and highlight three modules that support Trinity's social justice mission.

11:00 A.M. – 12:15 P.M. **BRUNCH**
East Side Dining

12:30 P.M. – 2:00 P.M. **TEAM TIME AND REGIONALIZATION MEETINGS**

Team Time

Teams may find any suitable location on campus to conduct a team meeting.

Regionalization Meetings

The 9 SENCER Centers for Innovation (SCIs) will be holding meetings for participants interested in getting more involved with SENCER at a regional level. The SENCER Regional Centers do not have strict borders. Participants interested in affiliating with a regional center should consider the proximity of their institution to the institutional homes of the regional centers, as well as any other factors, such as existing or desired partnerships with regional centers, institutions, or regional co-directors.

1. **New England**, based at **Worcester Polytechnic Institute** in Worcester, Massachusetts, represented by Karen Oates and Winnie Yu will be in **Wang Center Room 101.**
2. **MidAtlantic**, based at **Rutgers University** in New Brunswick, New Jersey, represented by Monica Devanas and Kathy Browne, will be in **Wang Center Room 301.**
3. **Chesapeake Bay,** based at **George Mason University** in Fairfax, Virginia, represented by Tom Wood, will be in **1310 Computer Science.**
4. **Central Plains**, based at **Butler University** in Indianapolis Indiana, represented by Joe Kirsch, will be in **Lecture Hall 2.**
   Midwest, based at **Roosevelt University** in Chicago, Illinois, represented by Robert Seiser, will also be in **Lecture Hall 2.**
   Great Lakes, based at **Case Western Reserve University** in Cleveland Ohio, represented by Glenn Odenbrett, will also be in **Lecture Hall 2.**
5. **South**, based at The University of **North Carolina Asheville in Asheville**, North Carolina, represented by Susan Reiser, will be in **Lecture Hall 1.**
   Southwest, based at **Texas Woman's University** in Denton, Texas, represented by Cynthia Maguire and Nasrin Kohan, will also be in **Lecture Hall 1.**
6. **West**, based at **Santa Clara University** in Santa Clara, California, represented by Kelly Uchiumi and Ulla Hasager, will be in **Wang Center Room 101.**

2:00 P.M. – 3:50 P.M. **SESSION BLOCK VI**

2:00 P.M. – 2:50 P.M. **CONCURRENT SESSIONS**

Leveraging Civic Engagement in Upper Level Courses: Introducing the "Microbiology of Urban Spaces"
Wang Center Room 101

Davida Smyth, dsmyth1@mercy.edu
Mercy College

The incorporation of civic engagement into the science and mathematics curriculum is something that faculty do well for introductory and non-major science courses. While this can be helpful in attracting students to the sciences, can we also vertically integrate civic engagement into upper level coursework, and support student success, engagement, and retention in these more content and skill driven courses?
This session will provide an example of such a strategy in an upper-level biology class. Davida Smyth, Associate Professor of Biology at Mercy College (Dobbs Ferry, NY) will present her research-based course "Microbiology of Urban Spaces" as a model for promoting civic and scientific literacy while integrating civic engagement into the microbiology curriculum. She will describe the potential impact of her efforts on student retention, engagement, and success. She will also demonstrate how she is leveraging the course to pursue her authentic research, with her undergraduate students, into antibiotic resistant Staphylococci.
Following the presentation and Q & A, participants will have the opportunity to share related strategies they use, and brainstorm new ideas for incorporating meaningful engagement activities into their major STEM courses.

Using Hands-On Learning Activities in the Collegiate Science Classroom
Wang Center Room 301

Karen Dunlap, kdunlap@twu.edu
Rebecca Fredrickson, rfredrickson@twu.edu
Texas Woman's University

Participants will have the opportunity to participate in three different hands-on learning activities for the science classroom (one physics, one geology, and one life science). The activities will include the use of legos, play-doh, and crayons. This is a fully participatory session meant to generate new ideas and best practices where participants will be working in groups and engaged in the activities.

Activities include making a timeline, building machines, and examining cells.

Strategies for Improving Group Work and Engagement in STEM Classrooms
Wang Center Lecture Hall 2
Focus: Teaching and Learning

Rachel Bergstrom, bergstromr@beloit.edu
Britt Scharringhausen, scharr@beloit.edu
Nicole Truesdell, truesdellnd@beloit.edu
Beloit College

Collaborative learning, also known as group work, is an essential component of many SENCER model courses. But how intentional are we in teaching students to recognize and value the skills associated with successfully engaging in group work as they wrestle with difficult STEM context in courses? In what ways do student identities and prior life experiences shape this engagement? How do we acknowledge identify these student identities and welcomes them as assets to improve group work and engagement with content? This session engages these guiding questions in a hands on workshop to identify personal assets and reflect on and model the processes of incorporating the lived experiences of our students in class. We argue that this model of teaching students to recognize and use important assets as they learn how to do group work can improve students learning and how deeply they connect with material.

Integrating Science and Social Justice in Our Lives: A Five-Phase Structured Dialog
Wang Center Lecture Hall 1
Focus: New Contexts for SENCER

Morgan Thompson, mnthomps@post.harvard.edu
Science and Social Justice Project

This session will engage participants in a five-phase dialog process with structured turn-taking around the following questions:

What are your personal experiences of how science and social justice are integrated in your careers and lives as teachers, researchers, mentors, activists, etc.?

What scaffolds or supports would be useful to you to support better integration of science and social justice in your teaching and research?

Participants will:

- Experience a dialog technique that we can use in classroom or meeting settings.
- Contribute to collective knowledge-sharing about how science and social justice concepts are and can be further integrated in our classrooms and lives.
- Learn about and express interest in connecting with the Science and Social Justice Project.

Dumbing It Up: How Public Information About Drinking Water Quality Can Be Made More Accessible To The Public

Wang Center Room 101

Focus: Community

Amy Lilienfeld, lilie1ar@cmich.edu
Central Michigan University

Source water assessments and consumer confidence reports are two important sources of information about public drinking water supplies that were the outgrowth of the "public-right-to-know" theme of the 1996 amendments to the Safe Drinking Water Act. Session participants will learn more about what these documents are and how they may be found online for communities in their own states. They will then be shown how the information in these documents could be the basis of either formal or informal science education. With respect to formal science education, being highly multidisciplinary, source water protection could enhance a broad range of subjects including chemistry, geography, engineering, biology, hydrology and geology as well as be the basis of civic engagement/service learning. With respect to its potential for informal science education - working directly with communities – the important potential role, as well as challenges, of working with newspapers and water utilities will be discussed. It is hoped that the outcome of this session will be the beginning of the development of a network of educators interested in helping make the science of drinking water quality and safety more accessible to an increasingly concerned public.

Documenting Achievements: How to Use Portfolios as a Professional Development Tool

Wang Center Lecture Hall 2

Focus: Academic Leadership

Monica Devanas, devanas@ctaar.rutgers.edu
Rutgers University

Are you designing or redesigning a course to include SENCER elements? Are you able to demonstrate your course improves student learning? Did you know the SENCER Models are formatted as Course Portfolios? A course portfolio is a key asset for professional development because it demonstrates what you did, why you did it and provides evidence of your success. Are you up for reappointment, or tenure, or on the job market? Consider a Teaching Portfolio. Do you need a framework for authentic student assessments, work projects and reflections on learning? Consider a Student Portfolio. Do you have administrative responsibilities? Consider an Administrative Portfolio. All of these variations have the same basic format that can be morphed into a very handy structure to describe and document your accomplishments and achievements. Shine the spotlight on your work through a portfolio and use it to improve your teaching, research, service, and trajectory for the future.

Implementing Peer-Led Research Activities in Computer Science: The Peer Enhanced Experiential Research in STEM (PEERS) Project at Northeastern Illinois University
Wang Center Lecture Hall 1

Scott Mayle, smayle2@gmail.com
Sudha Srinivas, s-srinivas@neiu.edu
Rachel Trana, r-trana@neiu.edu
Northeastern Illinois University

The primary goals of the NSF-IUSE "Peer Enhanced Experiential Research in STEM (PEERS)" project are to advance the research skills of undergraduate STEM majors, as well as to address graduation and retention rates of Northeastern Illinois University STEM students by incorporating peer-led mini research modules into introductory-level courses. The use of peer mentoring in inquiry-based hands-on research components increases engagement and retention by forming a multi-tiered academic support system that is additionally enhanced through professional development. The session will begin with descriptions of the different research modules and pedagogical techniques introduced in the five participating STEM disciplines, as well as student retention outcomes and evaluations. Attendees will then have the opportunity to participate in a topical activity mimicking the implementation of peer-led research components within the Computer Science field. Following the activity, attendees will have an opportunity to explore collaborations and provide feedback on the presented didactic practices.

So, What Do I Do?: Games and Curriculum for SENCER Courses
Wang Center Room 301
Focus: Teaching and Learning

Thomas Woodson, thomas.woodson@stonybrook.edu
Stony Brook University

As SENCER STEM educators we know that it is important to connect the material with societal impacts, but we often do not know what activities to do. This panel teaches participants two activities that connect STEM disciplines to the impacts that they have on society. Both games can be used to train students at a variety of education levels (high school students through PhD engineers). In addition, at the end of the session, participants will share other curriculum that can be useful in a SENCER course. Bring your great curriculum ideas and come ready to have fun.

3:00 P.M. – 3:20 P.M. **PRESENTATION SESSION**

Developing a College Undergraduate Research Certificate
Wang Center Room 102

Paula Bobrowski, bobrope@auburn.edu
Ann Knipschild, nipsak@auburn.edu
Auburn University

This session will explain the process and procedures the College of Liberal Arts at Auburn University used to develop an undergraduate research certificate, along with the challenges and complexities involved in doing so. This session will cover ways to put together an effective team to develop and promote the certificate as well as developing assessment criteria for it.

3:30 P.M. – 3:50 P.M. **PRESENTATION SESSION**

Application of Project Based Learning through Campus Prairie Restoration
Wang Center Room 102

Virginia McHugh-Kurtz, vmchughkurtz@roosevelt.edu
Roosevelt University and Elgin Community College

Project based learning is at the center of SENCER's mission of strengthening student learning and interest in STEM. A hands on approach to science education, beyond the cookbook labs, heightens student interest, helps students connect their learning to other courses and increases their understanding of science. A project based curriculum designed for a non-majors general biology course focused on restoration ecology and sustainability will be discussed. Data will be presented from courses with and without project based learning from the SALG (Student Assessment of their Learning Gains) and the overall course grades, with discussion of the validity of measuring student success.

4:00 P.M. – 4:30 P.M. **INSTITUTE ADJOURNMENT SESSION**
Wang Center Theater

Closing Thoughts on the 2017 SENCER Summer Institute
Eliza Reilly, eliza.reilly@stonybrook.edu
Executive Director
National Center for Science and Civic Engagement

SSI 2017 Poster Presentations
Friday, August 4, 2017
4:30 p.m. – 6:00 p.m.
Hilton Garden Inn Stony Brook University Ballroom

The annual SENCER Summer Institute Poster Presentations provide an effective means for sharing ideas, building community, and learning from one another.

Posters were selected following a competitive application process. They illustrate broad applications of the SENCER approach at colleges and universities and in communities, as well.

This year, both alumni and new participants will display plans for new projects and describe results of prior work.

Authors will be on hand during the reception on Friday August 4, 2017 from 4:30 p.m. – 6:00 p.m. in the Hilton Garden Inn's University Ballroom.
Electronic copies of all posters will be made available on the SENCER website following the Institute.

Please note, abstract listings may include authors who are unable to join us in Stony Brook this year. A contact list for all participants in the Institute is available in the SSI program book. We encourage you to contact presenters during and following the Institute.

Leaders from all National Center for Science and Civic Engagement initiatives will also be on hand to discuss results and activities. As always, please do not hesitate to contact any NCSCE staff member with questions!

Teaching Group Work: Active Reflection To Enhance Group Learning Experiences

Group work is a core feature of SENCER and SENCERized pedagogy. We wanted students to learn to be better group members by reflecting regularly on their own group roles and participation. Students in Introductory Astronomy and Emerging Diseases were placed in stable groups for up to 3 weeks and were asked to provide daily expectation/reflection notes regarding their participation in the group and the overall success of the group. After rotating through several different groups, students were asked to report on what they learned about group work through this reflection structure. Qualitative analysis of the reflection documents are compared to quantitative course grade information and SALG results. A Calculus course with group work but no reflection activity was used as a quantitative control. Assessing student experience in STEM courses in addition to learning outcomes and retention is important for long-term diversification of the field.

Rachel Bergstrom
Britt Scharringhausen
Beloit College

SENCERizing the High School Curriculum, One Unit at a Time

With a developing curricular focus on inquiry-based learning and community engagement, Carolina Day School is in an excellent position to pursue the implementation of SENCER based educational practices in a secondary school environment. To that end, nine teachers from CDS, representing multiple disciplines in the sciences, humanities and fine arts, attended the 2016 SENCER Summer Institute. The developmental and curricular differences between the standard SENCER target audience (college students) and secondary school classroom populations (ages 14-18) required the teachers to adjust some of what they learned to best meet the needs of their students. The end result has been the implementation of units in a variety of classes, as well as one school wide initiative, that address SENCER ideals, particularly in the areas of civic engagement, capacious problems, multidisciplinary studies, practicality and relevance. For example, in sophomore English classes, students used Antigone to study goals and complications of protests, staging and assessing a mock protest based on events in the play. Based on their understanding of viral life cycles, freshman biology students designed a molecule that could hypothetically stop the spread of HIV in a patient. In the Calculus 1 class, students utilized calculus concepts such as rates of change (derivatives), and net change (integrals) to study climate data. These initial efforts provide a foundation upon which Carolina Day can transform its approach to college preparatory education and be a role model for other secondary schools who may wish to do the same.

Joanne Bartsch
Dora Nelson
Carolina Day School

Outbreak! An Interdisciplinary Unit on Infectious Disease for High School Freshpersons

For the second successive year, through an interdisciplinary unit taught in their Human Biology and Global Studies classes, ninth grade students at Carolina Day School have studied the biological, socioeconomic and cultural factors that are necessary to thoroughly understand and effectively respond to outbreaks of infectious disease. Because all ninth graders at CDS are enrolled in both courses, teachers were able to maintain individuality of their own courses while finding areas of overlap; in all classes, the epidemiological triangle of host, agent and environment was the focal point for activities. For example, Human Biology students learned about virulence factors in bacterial pathogens while studying the socioeconomic factors underlying the cholera outbreak in London in 1854. A Global Studies lesson on the AIDS epidemic was taught concurrently with a Human Biology lesson on viral life cycles. For their final summative project, groups of students worked collaboratively to diagnose the cause of a fictitious disease outbreak in a modern country and to develop a response plan using current political, cultural, economic and environmental events and conditions in that country.

Joanne Bartsch
Dora Nelson
Carolina Day School

A Citizen Science and College Student Partnership to Assess Stream Health in the Charles River Watershed

Wheelock College and the Charles River Watershed Association are integrating classroom work with citizen science field research in urban stream health. The goal is to partner college students with scientists and citizen scientists working with the Charles River Watershed Association (CRWA) in the assessment of stream health in the Charles River. Introductory courses in environmental science and analytical chemistry, from two neighboring institutions in the Colleges of the Fenway, assessed both biotic and abiotic parameters within Boston's Muddy River. Environmental science students at Wheelock College participate in the Charles River Watershed Association's biological monitoring program assessing habitat and water quality using benthic macroinvertebrates (BMIs) as bioindicators. Sediment samples were also analyzed for metals by a Simmons College chemistry course. Chemical and biological data were collected from two sites within the Muddy River watershed; the Babbling Brook (MRBB) site and the Riverway site (MRRW) located downstream from the Babbling Brook. Students also assess habitat quality using the EPA rapid bioassessment. Participating in the biological monitoring program allows students to link their experiences in field collection, data analysis and data interpretation for management solutions directly to their course topics. Student interaction with CRWA scientists also provides insight into ways for continued engagement in the issues. These institutions aim to create connections between citizen scientists and students in science programs to create advocates for protecting and preserving urban waterways.

Elisabeth Cianciola
Charles River Watershed Association

Lisa Lobel
Wheelock College

Civic Engagement and Team Teaching at Eastern Kentucky University

The Honors Program at Eastern Kentucky University has as a formal strategic goal the incorporation of civic engagement in at least 25% of its courses. Since its inception in 1989, its courses have been team-taught, generally by faculty from divergent disciplines. In order to engage students and boost enrollment (as registration is semi-competitive) topics have focused on issues of student interest. The consequence has been an organic evolution of courses with both civic engagement and service learning. A variety of our courses and their syllabi with strong civic engagement components will be shared with discussions of how they serve to broaden the educational experiences of our students. They include topics from the natural and social sciences, mathematics, the humanities, agriculture, and health. Specifically, syllabi from these courses will be presented: “Food and Society: Changing Foodscapes Local to Global Scales” (taught by faculty from Agriculture), “Kentucky Narratives and Numbers (Eng and Math), “Bullying and Bibliotherapy” (Psy and Education), “Natural Resources and Community Identity in Appalachia” (Soc and Parks and Rec), “The Rise and Decline of the Antibiotic Era” (Bio and Environmental Health Sciences), “Katrina’s Heirs: Housing, Race, and Urban Renewal” (His and Eng), and a new course being developed, “Weaning Appalachia from Mother Coal: Energy for a New World” (Che and Econ).

Martin Brock
Eastern Kentucky University

Student Engagement in Exploring Mathematics

This poster is a report on the summer institutes for teachers of mathematics held at Lipscomb University for the past three years under a Math/Science Partnership Grant from the Tennessee Department of Education. This grant was funded by the U.S. Department of Education under the No Child Left Behind Act. The poster will cover the Institutes focused on Kindergarten - 4th grade teachers, 5th - 8th grade teachers and 7th - 12th grade teachers.

Carroll Wells
Lipscomb University

Enlightening General Education Science Courses with Global Humanities: A New Road to Diversity

Lipscomb University is a campus LIGHTing up. LIGHT (illuminating cultural engagements) represents a new QEP (quality enhancement plan) to stand alone or embrace the SALT (service and learning together) experience. Two general education science courses taking on the challenges of carrying this torch are Power of Science: Biology and Chemistry and Foundations of Biology; the challenges: keep content consistent, students engaged, and increase awareness of the global humanities. Since similar Biology content is taught in both courses, both sets of students provide a basic and balanced perspective in feedback. Venues now used in classes: role playing in educational skits about the global language that represents science, using music as a learning tool, encouraging international students to participate in science term pronunciation, intentionally incorporating greater historical detail within topics, and including the different cultural perspectives in topics such as water use.

Students continue to research and present topics concerning genetic diseases and medicinal chemicals; yet now a broader worldview is mandatory. Basic SALG feedback for their first semester with changes is presented. The SALG instrument will be refined after the first semester's use to enhance course development. In the future, courses which have been approved will carry the designation of being a LIGHT course.

Tamera Klingbyll
Lipscomb University

MTSU EYH is Making an Impact on the Future Workforce in the Chemical Sciences in Tennessee

MTSU through its Women in STEM (WISTEM) Center introduces science, technology, engineering, and mathematics (STEM) disciplines to young girls during their middle and high school years. MTSU has been the host of the annual Expanding Your Horizons (EYH) conference for over 20 years, bringing STEM opportunities to girls in a day full of interactive workshops. Each workshop is led by role models and mentors who recognize the need to build the future STEM workforce. We will share what we have learned from our perceptions and the perceptions of over 1000 girls from the past EYH conferences about STEM education and careers. We will also show the impact that parents, as well as teachers and other adults, have on young girls regarding STEM education and careers.

Rachel Marlin
Middle Tennessee State University

Science Teachers As Facilitators of STEM Literacy

Pre-service science teachers are often not trained in issues related to the importance of instilling STEM literacy as they relate to social justice issues in their students. Many pre-service teachers are not aware of the impact scientific thinking and literacy that students learn in their classes has on society at large. In this poster I will share findings from a seminar entitled "STEM Literacy and Society," where preservice science teachers were given an arena to explore these issues.

Mubina Schroeder
Molloy College

An Active Learning Approach Utilizing Case Study Presentations to Demonstrate Physiological Principles in Anatomy and Physiology

Inclusion of active learning techniques, specifically case study work, resulted in learning gains as noted by increased scores on a national standardized exam. Active learning is a method that can be used in a classroom that directly involves students in the learning process. This method can include case study presentation and analysis, students using the whiteboard during discussions, or small group discussion in class. This type of metacognitive learning is successful in documented gains in the more difficult integrative physiological processes.

Metacognitive learning research has been done, however we were primarily interested in the use of active learning in upper level anatomy and physiology classes. This integration would not only benefit the student's learning of physiological processes, but also give them a platform to build the knowledge of different human systems, and integrate that knowledge throughout the two course series.

It is hypothesized that the use of active learning students will learn the material better and the results will be an increased score on the HAPS exam, a comprehensive exam produced by the Human Anatomy and Physiology Society. It can be assumed that a majority of professors in the United States primarily teach using traditional methods.

The students' scores on this exam were recorded in the spring 2016 (n=25) and spring 2017 (n=17) semesters. Student's t-test was used to compare each semester to the national average. Using this test, it was found that in both semesters, the students scored significantly higher than the national average. This difference can be attributed to active learning, and has shown that active learning is a better technique than traditional learning in Anatomy and Physiology.

Austin Alcott
Richard Bastian
Bernadette Dunphy
Pavneet Kaur
Monmouth University

Student Environmental Engagement at the Intersection of Science and Humanities

Catherine Duckett, a science professor, and Heide Estes, a literature professor, developed and co-taught an interdisciplinary course entitled "Humans and the Environment". Exercises were designed to increase engagement and to increase student's sense of civic efficacy. Preliminary assessment of the course showed increases in student self efficacy and interest in improving the environment. Design of exercises and further work to refine the course will be discussed.

Catherine Duckett
Heide Estes
Monmouth University

Designing Curriculum and Activities that engage Middle School Educators

We have modified an existing Physics Concepts for Educators course and developed a new linked Earth Science Concepts course within the Math and Science teacher education program at Northeastern Illinois University. The Math, Science and Technology for Quality Education (MSTQE) program at NEIU is a bridge program run in partnership with City Colleges of Chicago in which faculty and students from both institutions teach and study together. The goal of MSTQE is to create a well-educated, diverse cohort of elementary and middle school science and math teachers. We have developed a set of activities that are being incorporated into the curriculum in these courses to better engage students, and that students in turn can use for outreach and eventually develop further for use in their own schools as educators. An overview of the results of our work will be presented.

Sudha Srinivas
Scott Mayle
Northeastern Illinois University

Redesigning Labs Exercises in Two Biology Courses to Enhance Scientific Engagement

The topic of water quality is not uncommon in school curriculum from kindergarten through higher education. However, it is easy to become inattentive of water quality issues when growing up in a developed country with seemingly unlimited access to "clean" water. To establish, or re-establish, links between water quality and life, Palo Alto College and Northeast Lakeview College redesigned portions of two biology courses' laboratory exercises: General Biology for Majors I and Microbiology for Majors. The primary goal of the redesigns was to improve retention and success of students enrolled in targeted biology courses by applying learning to real-world issues related to water quality and using evidence-based analysis within laboratories. General Biology labs included water quality analysis of natural and artificial water sources on the two college campuses, descriptions of the relationships of water quality to biota, reviewing of science literature, and guest speakers. Microbiology labs included relating water quality characteristics to the presence of microorganisms. Results of pre-course and post-course assessments of course content and pre-redesign and post-redesign Student Assessment of Learning Gains (SALG) were analyzed to determine the effectiveness of the course redesigns.

Laura Houston
Northeast Lakeview College

Jerrod Butcher
Lance Sandberg
Palo Alto College

“Communicating Science” – An Interprofessional Course Improving Communication Skills in Doctoral Science Trainees

A new Communicating Science course was developed through a grant from the Burroughs Wellcome Fund to help Ph.D. students improve their communication skills and learn how to present their science accurately, clearly, and vividly, using narrative as an effective tool to engage diverse audiences. A multidisciplinary faculty was recruited from several schools of Rutgers University, including the Graduate School of Biomedical Sciences, School of Environmental and Biological Sciences, Mason Gross School of the Arts, School of Communication and Information, New Jersey Medical School, and Robert Wood Johnson Medical School. Invited guest speakers from other centers of Rutgers, as well as private companies, also gave presentations to complement course content. We are especially proud that the course brought together faculty from the sciences, communications and the arts, who may not have otherwise had the opportunity to meet and work together, but who have now forged a bond over training our students.
In addition to lectures, we included improvisation exercises as a major component of the course. Since improvisational training exercises focus on skills of listening, observing, and responding, they teach students how to be aware of and engage their audiences. A central element of our Communicating Science course is for each student to prepare a 3 minute oral presentation about their research. Once prepared, they improve their short talks over the duration of the course as they learn the key elements of effective oral communication. Students learn how to identify the central message they wish to convey, minimize jargon, and connect with the audience to get their message across. We video recorded their 3 minute talk at the beginning of the course and recorded them again at the end of the course as one way to assess improvement. Although students displayed varying levels of proficiency, confidence, and style in giving their initial oral presentation, they all showed improvement in these parameters in their second presentation. Our students were engaged and enthusiastic about the format and content of Communicating Science throughout the course. Results of our course evaluation surveys indicated that they enjoyed the course as they learned to tell diverse audiences about their research in language that is clear, understandable and without the discipline-specific jargon. Offering our course to these pre-doctoral students has convinced us more than ever that there is an unmet need to integrate new and innovative methods into the curriculum to help all our science students learn how to communicate what they do and why it's important to diverse audiences.

Nicholas Ponzio
Rutgers New Jersey Medical School

Human Development and the Natural World: Engaging Students in Interdisciplinary Problem-Solving at the Intersection of Society and the Environment

Human beings depend upon ecological and social systems to provide the resources they need to live happy and healthy lives. In an interconnected world with a rapidly growing population, competing needs for shared and limited resources and the impact of human activities on the environment create challenges that have no ready solutions.

A General Education course at San José State University, Human Development and the Natural World, is framed around "wicked" problems, real problems that matter outside the classroom, may appear impossible to solve due to social and scientific complexity, and cannot be addressed without the cooperation and coordination of people with different knowledge, skills, life experiences, values and perspectives. This course employs case studies around the water-food-energy nexus and systems thinking to engage students in analysis of a series of current wicked problems and the environmental and social factors that underlie these issues. Student teams identify a wicked problem of interest to them, conduct research into this problem, delve into the experiences and perspectives of various stakeholders, and share their findings with a relevant audience. This course is included in SJSU's emerging thematic General Education Pathway in Sustainability and is serving as the foundation for development of an online Introduction to the Principles and Concepts of Sustainability course for the California State University's cross-campus minor in Sustainability.

Ellen Metzger
San Jose State University

Engaging Students in the Core Curricula through a Healthy Neighborhoods Project

In the Spring 2017 semester, students from a section of the Scientific Inquiry Core at St John's University partnered with an Introduction to Sociology class to address addiction issues in Staten Island, NY and its effect on the health of neighborhoods. Groups of students investigated the issues associated with abuse with emphasis on tobacco, alcohol, and prescription, recreational or opiate medications and drugs. Additional groups researched childhood vaccine deniers and the effect of food deserts on health.
The two classes pursued interdisciplinary projects from the perspectives of science and sociology, each class working independently, but collectively sharing their projects at the end of the semester together in a community presentation and open dialogue between the classes. The projects addressing the problems of substance abuse, especially among young adults, resulted in short public service announcement (PSA) videos accompanied by empirical and factual PowerPoint presentations, with overlying audio. The student projects focused on drug and alcohol abuse as a personal trouble and a public issue having social consequences, which ultimately affect neighborhood health. Reference was made to the global and national scope of these problems as well.

This activity was initiated as part of an ongoing collaborative research effort with the Staten Island Performing Provider System (SIPP) and the Staten Island Borough President's Office in New York City. Previous students were involved in collecting community data utilizing the CDC's vetted Healthy Communities Program "CHANGE" survey tools, i.e. Community Health Assessment and Group Evaluation. In conjunction with the goal of building healthy neighborhoods through civic engagement and education, there is a strong local emphasis on drug and alcohol problems in Staten Island, and the New York metro area. The artifacts created through this activity will be contributed to the Staten Island Partnership for Community Wellness/ Tackling Youth Substance Abuse (TYSA) and Reality Check (Tobacco Free Staten Island) to be used in their public service/ educational campaigns for which our SJU students received credit for academic service-learning (AS-L).

Irene Dabrowski
Roberta Hayes
St. John's University

SENCER Hawai'i - Working Towards Creating Communities of Transformation Integrating Indigenous and Traditional Academic Knowledge Systems

The SENCER Hawai'i model state team will present recent work of both the overall team and individual team members to address the grand challenges of our time through developing high-impact pedagogical practices, institutional transformation, and collaborative network based in SENCER principles and the integration of indigenous, natural, and social sciences. The intention is to create an open, interactive exchange with SSI participants about creation of collaborative network to support professional development for lasting institutional change and community-based partnerships. We are specifically interested in modeling, inspiring, and learning about similar initiatives and collaborations elsewhere that aim at integrating local, indigenous, and traditional academic practices and ways of understanding to provide contexts for research and inquiry-based learning that make it possible connect civic issues to STEM content, encourage the incorporation of different perspectives, push students and faculty to critically analyze preconceptions, and actively engage us all in authentic research.

SENCER Hawai'I Team

Measuring Student Outcomes in the Affective Domain: A Survey of Research in the Field

SENCER courses often include outcomes that are difficult to measure quantitatively because they diverge from the traditional cognitive domain outcomes and straddle the affective domain. This domain includes how students deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes. One popular instrument, the SALG (Student Assessment of Learning Gains) collects indirect, self-report data on the degree to which a course has enabled a student to learn; however what instructors want are direct measurements of the "fuzzy" realm of student appreciation, values and characterization within their discipline, particularly around the connection between science, civics and society. For instance, we ask ourselves, 'To what extent has my course increased my students' appreciation of or valuing of sustainability in the environment?' 'Are my students demonstrating changes in judgment and behavior in light of new evidence?'

To inform our assessment practices and develop measurement, a survey of research on the affective learning domain is valuable to make meaningful applications and identify methodologies we can adapt for discipline-specific use. A practical review covering methodologies, instruments and outcomes across disciplines will be displayed for discussion and sharing.

Patricia Aceves
Stony Brook University

Ecosystems and Human Impact 350 and 351 as SENCER Course Models

By its nature, ecotoxicology unites science, policy and culture. For instance, the WHO reclassified the main ingredient in Roundup, a popular herbicide, as a probable carcinogen, uniting food safety, environmental health, and science. By linking social and civic issues (food safety) to disciplinary learning (biology, chemistry, toxicology), the Ecosystems and Human Impact 350 and 351 courses offer students a platform to learn about research design and implementation in a meaningful way, making the course series an ideal SENCER Model.

These courses benefit both BA and BS students. STEM students use these courses as a gateway to personal research projects. Some students conduct their Honor's research in the lab. Other students spend a semester between graduation and the start of an advanced degree conducting research in the lab. Research conducted last summer led to a publication in a peer-reviewed journal, and we have several papers currently in review. Additionally, students enrolled in humanities majors enjoy these courses because they want to see what scientists actually do. Keeping STEM and non-STEM students working together ensures that they both understand and respect the others' endeavors. Non-STEM students from my lab have gone on to law and journalism school.

Because students design these projects, they conduct their research meticulously—not because they care about the grade but because they care about the result. Does artificial turf harm earthworms and soil microbes? Can plants carry harmful amounts of glyphosate into the soil? Does local compost contain measurable amounts of animal pharmaceuticals, and can food plants absorb those chemicals? They want to know.

My goal is to get students excited about science. I want them to be able to say exactly what scares them about a particular chemical or environmental exposure. I want them to be able to access the scientific literature and determine whether or not being nervous about a substance is warranted. If it is, I want them to feel empowered that THEY can determine if the substance is actually dangerous. EHI 350 and EHI 351, SENCER Model courses, allow them to do that.

Sharon Pochron
Stony Brook University

The Impact of Septic Systems on Long Island's Aquifer - An Interdisciplinary Study

Suffolk County Community College is one of six institutions in New York working with the National Center for Science and Civic Engagement (NCSCE) who received special funding from the Helmsley Charitable Trust to promote STEM student success through civic engagement. The Suffolk project focuses on water quality, a critical citizen science issue on Long Island (NY). Students enrolled in courses from four different disciplines - chemistry, journalism, engineering science, and construction technology- have explored this issue as a common theme and have identified and proposed solutions to the problem of water quality degradation, mainly due to increased Nitrogen loading. This topic is of particular interest since Long Island's drinking water is drawn from a sole-source aquifer and the primary means of waste disposal is through individual cesspools/septic tanks, particularly in Suffolk County, the easternmost county on Long Island, NY.

An important component of the project was to use the Science Education for New Civic Engagements and Responsibilities (SENCER) approach to teaching and learning. The SENCER approach features the teaching of course content through the lens of student identified civic issues and proposed solutions. The societal effects of the implementation of proposed solutions are also considered. An interdisciplinary Blackboard site complemented the coursework and provided a central communication link for students and professors to share resources, research and insights. In addition to the professors involved, a Chemistry post doc with experience studying water quality issues, experts in local groundwater, politicians and community leaders led online discussions. These discussions included an examination of a new septic system currently being piloted in Suffolk County which reduces Nitrogen loading. Students synthesized scientific information, along with economic, societal and renewable energy implications to arrive at a recommendation.

This presentation will highlight lessons learned from this Citizen Science project including insights from student research, dialogue and assessments of all stakeholders.

Kathryn M. Gutleber
Rebecca K. Davan
Zuhair Al-Masri
Brittany Golden
Angela N. Migues
Margaret Altizer Evans
Nina Leonhardt
Peter Maritato
Elaine Merenda
Natalie Nieman
Candice J Foley
Sharadha Sambasivan
Suffolk Community College

Progress in the TWU Pollinator Garden after Two Years

A group of Texas Woman's University (TWU) faculty have worked together to plan and implement a pollinator garden project as an academic teaching tool on our campus. This garden is not maintained by our campus landscape staff, but rather by faculty and student volunteers. It is a true citizen science project allowing our students to learn about plant-pollinator relationships using plants native to our area in Texas which are also drought tolerant. Planning began in early 2015; visible changes in the ground commenced in fall 2016.

There are many reasons for increasing concerns about failing support for biodiversity in our ecosystems. Our project involves the transformation of certain areas on campus from lawns, which require significant water, fertilizer and maintenance, into a set of sustainable pollinator gardens that will create habitat for insects and birds which underlie the biodiversity in all ecosystems. These will also be places of beauty for humans to refresh themselves. The plants in these gardens will require very little added maintenance, thus reducing pollution from pesticides and fertilizers. Because they are also drought tolerant, water consumption will also be significantly lower once the beds are established.

This presentation will detail the progress and perils encountered to date, along with practical tips for others who may want to implement gardens on their campuses.

Cynthia Maguire
Texas Woman's University

TWU Active Engagement Academy: Improving Active Engagement in Academic Courses

High enrollment classes (greater than 50 students) have historically been associated with lower student engagement and higher failure rates than lower enrollment classes. Active learning has been demonstrated to increase student engagement and, indirectly, student persistence. In addition, faculty who use high engagement in their classrooms become pedagogical role models for the future teachers who are enrolled in their courses. By initiating an Active Engagement Academy at Texas Woman's University, faculty who teach large lecture classes have been recruited and trained to use active learning and teaching methods to foster student engagement, academic success, and retention. The Active Engagement Academy model will be self-perpetuating as participating faculty will become role models within their academic departments for other faculty and for the teacher candidates enrolled in their courses. This presentation will provide a model and framework for other instructors who wish to promote active engagement in their institution's classrooms, including the rationale, recruiting information, workshop plans, and designs for active engagement implementations and measurements for intervention success.

Tina Gumienny
Texas Woman's University

SENCER Projects Added into Anatomy and Physiology and Physics Labs

Two projects were added into anatomy and physiology labs and physics labs taught at Texas Woman's University. The proposed anatomy and physiology project was a pilot program designed to enhance civic engagement through the learning of science content using medicinal−based queries. In this project, the aim was for students to better understand their own bodies as well as real world problems facing human populations globally. The physics project was also a pilot program to increase student awareness and appreciation of energy sources and consumptions. The physics project encouraged students to reflect on the advantages and disadvantages of a system and to use physics and mathematics equations to justify their reasoning helping them to use this knowledge toward future environmentally friendly practices and sustainability. Based on feedback from the pilot programs, improvements will be made and the modified projects will be implemented into other anatomy and physiology and physics laboratory courses. In this presentation, we will discuss the results of these pilot projects along with the challenges and future work. This work was supported by SENCER−National Science Foundation Post−Institute Implementation Award.

Nasrin Mirsaleh-Kohan
Shaumarie Tanner
Texas Woman's University

Chemistry Module: "What's in My Water — Is There Lead in DC Drinking Water?"

A SENCER-inspired module at Trinity Washington University in DC taught introductory chemistry concepts (atoms, ions, molecules, ionic compounds, precipitation reactions, moles and molarity) through the problem of lead in drinking water. Students learned about the contamination of DC water a decade ago, a crisis that Virginia Tech civil engineer Marc Edwards, who uncovered the recent lead contamination in Flint, MI, called "the most fundamental betrayal of public trust and scientific integrity." Laboratory exercises included quantitative determination of lead in water using iodide and a culminating open-ended experiment where students devised their own ways to remove copper(II) from water. Students researched what individuals in DC can do to address the lead problem, and created two infographics, one explaining the chemistry of how lead got into DC drinking water and another outlining what DC residents can do to reduce exposure to lead.

Shizuka Hsieh
Mahshid Khavari
Trinity Washington University

Sustainability in Civil Engineering

The CEE department at the University of Hawaii at Manoa has been developing a comprehensive set of senior level courses for the undergraduate curriculum in civil and environmental engineering (CEE). Four of the six planned courses have already been developed and taught at least once. The department is planning to develop a dedicated Sustainability to complement its existing Construction and Structures tracks.
The initial positive results of this effort is that in 2016 the department clearly fulfilled the ABET requirement on sustainability and fully satisfied the recommendation of the department's Industry Advisory Committee to include sustainability in the CEE curriculum.

Panos Prevedouros
University of Hawaii at Manoa

An Interdisciplinary Undergraduate Science Program Addressing Societal Issues

Graduates of a four-year program focusing on applying scientific knowledge to solving global problems reported confidence in interdisciplinary collaboration, practical problem-solving, and teamwork. Self-evaluation by undergraduates in the program indicated high levels of achievement of learning goals related to addressing real-world problems through science. In order for the next generation of scientists to solve future societal problems, students in STEM fields must learn to collaborate across disciplines. The Integrated Concentration in Science (iCons) program at the University of Massachusetts Amherst is a four-year team-based interdisciplinary science program designed to address societal issues in renewable energy and biomedicine. In their first year, students work in interdisciplinary teams on case studies like emerging contaminants, Zika, or antibiotic resistance. After their first year, students choose either the renewable energy or biomedicine track. Second year students complete a course in Integrated Scientific Communication in which they communicate scientifically to a wide audience. Students conduct research in teams on a societal issue in their third year. Seniors complete theses, communicate their findings through videos, and reflect on their experiences through the program. Program faculty address the role of science in solving global problems, emphasize practical applications for scientific concepts, empower student inquiry and research interests., and promote accountability in science through sound methodology. Overall, participants in the program report understanding of the interdisciplinary nature of societal issues and confidence in their ability to collaborate on scientific problem-solving.

Erica Light
University of Massachusetts Amherst

A College Course That Helps Freshman Bust Myths about Urban Legends and College Life

A 5 credit course called Mythbusters! has been offered where the culmination of the course was the creation of a Mythbusters! style video that debunked a myth or urban legend, shown on an IMAX screen at the Pacific Science Center. The event was mutually beneficial; high school interns at the science center evaluated the videos and college students participated in a panel on the high school to college transition. As part of the course, videos underwent several stages of review: instructor review of their research question and experimental methodology, peer review of draft videos, and evaluation of the final video project by college students and high school interns at the Pacific Science Center.
After the project, college students reflected on the experience through online discussions, in class discussions, and reflective papers. Participants in the project demonstrated increased awareness of the role of science in busting myths. This poster discusses the pedagogical scaffold for the course/assignment, evaluations of the videos by college students and high school interns, and course evaluations. In one year, groups with female students received higher peer evaluation scores than groups with male students, contrary to scores typically seen in sciences. These outcomes and evaluations suggest that it may help increase student awareness of equity and thus merit further study.

Charity Lovitt
University of Washington Bothell

Integrating SENCER into the Public Health Curriculum

A series of faculty development workshops and an increased SENCER presence and voice in campus poster sessions and pedagogy-focused groups has started the process of building a community of practice on the University of Wisconsin – Whitewater campus, including an increased roster of SENCERized courses available in the campus' new public health minor. In coordination with the LEARN Center, a UW-W campus program to improve teaching and student learning, a small core group of faculty who utilize SENCERized courses developed 2 workshops to encourage and guide interested faculty and staff through the process of infusing their courses with the SENCER ideals. The workshops were developed primarily for the instructors of the courses within the public health minor; however, they were open to all faculty and staff on campus. To continue to increase awareness of SENCER and build a community of practice, the core group also presented at the annual 2017 Assessment Day poster session and have discussed SENCERized courses and guiding principles with various faculty development groups, including book clubs, the Community Based Learning Fellows program, and the Public Health Strategic Initiatives working group.

So far, this outreach has resulted in three new SENCERized courses within the public health minor that were developed by two additional faculty members for a total of five courses within the minor. In addition, the Mathematics department is considering a SENCER-based approach to the development of their new introductory-level general education course. Some initial assessment is currently in progress for the two original SENCERized courses within the minor using the SENCER-SALG to determine the impact of the course design on student learning.

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BIOGRAPHICAL SKETCHES OF SSI 2017 PLENARY SPEAKERS AND SENIOR STAFF

David Asai is Senior Director for Science Education at the Howard Hughes Medical Institute. David directs the HHMI Undergraduate and Graduate programs, providing grants to higher education institutions, faculty, undergraduate and graduates students. Before moving to HHMI in 2008, David was on the faculty for 19 years at Purdue University and for 5 years at Harvey Mudd College. He served as Head of Biological Sciences at Purdue and was Stuart Mudd Professor and Chair of Biology at Harvey Mudd. Until 2010 when he closed his lab, his group authored more than 75 papers on the molecular motor dynein in sea urchins and Tetrahymena thermophila. David served as a member of the boards of trustees of the National PTA and the Higher Learning Commission-North Central Association, and served on the BIO Advisory Committee of the National Science Foundation. He is an elected member of the Purdue Teaching Academy and was inducted into Purdue's "Book of Great Teachers." Currently, he serves on several advisory committees, including the Progress Through Calculus project of the Mathematical Association of America, the Interdisciplinary Teaching About Earth for a Sustainable Future (InTeGrate) NSF STEP center, the University of Delaware NSF ADVANCE Institutional Transformation project, the Minority Affairs Committee of the American Society for Cell Biology, the Understanding Interventions project, the Committee on Opportunities in Science (COOS) of the AAAS, Research Enhancement for BUILDing Detroit, the NIH Advisory Committee of the Director's Working Group on Diversity, and the Children's Opportunity Fund of Montgomery County, Maryland. David received the bachelor's degree in chemistry and co-terminal master's degree in biology from Stanford University, and the Ph.D. in biology from Caltech.

Myles Boylan is Lead Program Director in the Division of Undergraduate Education within the Directorate for Education and Human Resources (EHR). Since becoming a Program Director in 1996, he has worked on many education programs. In recent years he has co-led TUES (Transforming Undergraduate Education in STEM) and WIDER (focused on catalyzing institution-wide implementation of evidence-based teaching methods). After these two programs were coalesced into a broader program titled "Improving Undergraduate STEM Education (IUSE)" in 2014, he led this new program in its EHR version, IUSE: EHR.

Myles' doctoral work was in industrial economics. He held a variety of academic appointments before joining the NSF in 1984. His academic research focused on the process and diffusion of technological innovation in private industry and he continues to work through NSF to accelerate the diffusion of proven teaching methods and institutional change.

Katayoun Chamany is the Mohn Family Professor of Natural Sciences and Mathematics, Chair of the Interdisciplinary Science Program, and Project Shepherd and Director of University Science Labs at The New School. A longtime participant, contributor, and faculty leader in SENCER programs, Katayoun has developed educational materials integrating social justice perspectives into biology, providing more highly-contextualized biology education to students. In Spring 2016, she launched Stem Cells Across the Curriculum, an open access collection of educational modules developed in collaboration with colleagues in the humanities, social sciences, and arts/design. In recognition of her transformative teaching and leadership, Katayoun was became the first-ever endowed professor Eugene Lang College of Liberal Arts. She received her Ph.D. in Cell and Molecular Biology from UC Berkeley, and serves on the editorial boards of the National Center for Case Study Teaching in Science and the journal Life Sciences Education.

Elyse Eidman-Aadahl is Executive Director of the National Writing Project (NWP). NWP is a network of sites anchored at colleges and universities and serving teachers across disciplines and at all levels, early childhood through university. The network provides professional development, develops resources, generates research, and acts on knowledge to improve the teaching of writing and learning in schools and communities.

In her role at NWP, Elyse draws upon 15 years of experience designing and leading national programs, partnerships, and action-learning efforts for the NWP and other educational organizations. Prior to becoming Executive Director, Elyse directed National Programs and Site Development for the NWP where she developed many of NWP's signature national programs and partnerships. Her recent work involves educators in schools, libraries, and museums as they rethink their teaching and learning environments with a view toward digital composition and production, connected learning, equity, and civic engagement. In that regard, Elyse is the founder of NWP's Digital Is project and community, supported by the John D. and Catherine T. MacArthur Foundation's Digital Media and Learning Initiative (DML), and is a member of the DML's Youth and Participatory Politics research network. She is a founding member of the Connected Learning Alliance and helped establish the YOUmedia Learning Labs network, the Make to Learn Initiative, and the Educating for Democracy in a Digital Age project.

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 and chair of the department of technology and society in the College of Engineering and Applied Sciences at Stony Brook University. As of November 2015, The National Center for Science and Civic Engagement is a part of the department. He holds a joint appointment in the department of applied mathematics and statistics. In addition to his departmental responsibilities, he holds the position of associate provost for diversity and inclusion. He has directed numerous projects, including a half-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 co-director of the 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.

Karen Kashmanian Oates is a co-founder of the SENCER project and a Professor of Arts and Sciences at Worcester Polytechnic Institute (WPI). Before joining WPI as the Peterson Family Dean of Arts and Sciences, Karen was the deputy director for undergraduate education at the National Science Foundation. She was also the founding provost at Harrisburg University of Science and Technology, and Associate Dean for the College of Integrated and Interdisciplinary Studies at George Mason University. She received her BS in biology from Rochester Institute of Technology and her PhD in biochemistry from George Washington University. Karen conducts faculty development workshops on a variety of topics, including progressive pedagogical approaches to support learning, assessment strategies, and discovery-based undergraduate research, as well as using research on how people learn to inform curricular design. She has served as a Eurasia Specialist with USAID/HED (Higher Education for Development) and participated routinely in global research and education initiatives. In recognition of her founding role in SENCER, Karen, along with Wm. David Burns, received the 2008 Bruce Albert Award for excellence in science education.

Danielle Kraus Tarka is the Director of Programs and Operations for the National Center for Science and Civic Engagement. She manages all national office operations and supervises the coordination of SENCER and the Center's national events, including the annual Summer Institute and Washington Symposium and Capitol Hill Poster Session. Danielle ensures linkages across the NCSCE's SENCER, GLISTEN, SENCER-ISE, SCEWestNet, Engaging Mathematics, and other developing initiatives, as well as the websites to support communication and dissemination of resources. She researches new program opportunities, leads strategic planning activities, and coordinates grant preparation and management of awarded funds, including subgrant programs. She earned her bachelor's degrees from the Pennsylvania State University and completed a nonprofit management executive certificate program at Georgetown

Rick Moog is the Executive Director of the Process Oriented Guided Inquiry Learning (POGIL) project at Franklin and Marshall College. Rick received an A. B in chemistry from Williams College and a Ph.D. in physical chemistry from Stanford University. He is currently Professor of Chemistry at Franklin & Marshall College. He is the 2016 recipient of the George C. Pimentel Award in Chemical Education from the American Chemical Society. Along with colleagues Jim Spencer and Frank Creegan, Rick is also the co-recipient of the 2015 James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry from the Northeast Section of the American Chemical Society.

Rick has been using a guided inquiry approach to teaching chemistry since 1994, and is the coauthor of POGIL materials for general chemistry and physical chemistry. In addition, he has developed guided inquiry experiments for use in the general chemistry laboratory. Rick has organized numerous symposia at national ACS and BCCE meetings concerning POGIL (and active learning more generally) throughout the chemistry curriculum, and has given dozens of presentations, posters, and workshops on POGIL. He is also coauthor of several journal articles and book chapters concerning POGIL, and the coeditor of the ACS Symposium Series volume: Process Oriented Guided Inquiry Learning.

Eliza Jane 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.

Fotis Sotiropoulos is Dean of Engineering and Applied Sciences at Stony Brook University. As Dean, Fotis is committed to fostering "creative, cross-disciplinary research and educational programs, to produce the next generation of leaders, entrepreneurs and innovators." His research focuses on simulation-based engineering science for fluid mechanics problems in renewable energy, environmental, biological, and cardiovascular applications. Funded by the National Science Foundation, the Department of Energy, the National Institutes of Health, the Sandia National Laboratories, private industry, and other state and federal agencies, Fotis has raised over $35M in externally-sponsored funds for research and research facility development and renovation. He is the 2017 Recipient of the American Society of Civil Engineers Hunter Rouse Hydraulic Engineering Prize and a Fellow of the American Physical Society (APS). He has authored over 170 peer reviewed journal papers and book chapters, has twice won the APS Division of Fluid Dynamics Gallery of Fluid Motion (2009, 2011), and is also a recipient of a Career Award from the National Science Foundation. He is also a 2014 distinguished lecturer of the Mortimer and Raymond Sackler Institute of Advanced Studies at Tel Aviv University and is serving or has served on the editorial boards of several journals. Fotis was named a Distinguished Professor at Stony Brook University in 2017.