



# SENCER

SCIENCE EDUCATION FOR NEW CIVIC ENGAGEMENTS AND RESPONSIBILITIES

## 2016 SENCER Summer Institute

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**Roosevelt University**  
**July 28 - August 1, 2016**



NATIONAL CENTER FOR  
SCIENCE & CIVIC ENGAGEMENT



**Stony Brook**  
**University**



INSTITUTE of  
**Museum and Library**  
SERVICES

THE LEONA M. AND HARRY B.  
**HELMSLEY**  
CHARITABLE TRUST



NOYCE  
FOUNDATION



**EPA** United States  
Environmental Protection  
Agency

**[www.ncsce.net](http://www.ncsce.net)**  
**[www.sencer.net](http://www.sencer.net)**

**Twitter: @NCSCE**  
**Twitter: @SENCERnet**

**#SSI2016**

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# SENCER

SCIENCE EDUCATION FOR NEW CIVIC ENGAGEMENTS AND RESPONSIBILITIES

Greetings and welcome! This is our 16th SENCER Summer Institute and we are delighted to be hosted by Roosevelt University. Special thanks to Bob Seiser, Melanie Pivarski, Cathy Evins, and the entire Roosevelt University community for your hospitality.

The central theme of this year's Institute is transformation. Transformation is expressed throughout several facets of our work this year, from the continued progress in our SENCER, SENCER-ISE and Engaging Mathematics projects to our pursuit of opportunities emerging from new partnerships and initiatives, and our organization being profiled in a recent USC monograph by Adrianna Kezar and Sean Gehrke as a Community of Transformation in STEM reform.

Furthering our theme of transformation, the National Center and its programs are also part of a new institutional home. We wish to acknowledge and thank our new hosts at the Technology and Society Department of Stony Brook University for their continued support of our work.

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 2016 program that we would like to call to your attention:

- We have a new mobile application this year. We hope that its abilities to facilitate a personal schedule, networking, and social media interactions will enrich your experience at the Institute.
- In order to provide you with a more interactive and multifaceted experience at SSI plenaries, we have added response panels and interactive activities to this year's All-Institute presentations. The respondent panels will provide the audience with new perspectives on the issues and solutions raised in the plenary address. Responses will be followed by an interactive activity where audience members will work together to devise ways of applying the lessons of plenaries at their home institutions.
- 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 (under a tab in this book) 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 have put together several session blocks, during which sessions of different lengths will run concurrently. This new approach to scheduling emerges from feedback from past symposia evaluation and from conversation with many members of the community.

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 2016

### *BY THE NUMBERS*

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235 Invited Participants and Facilitators

26 Groups and Teams

51 Individual Participants

116 New Participants

119 Alumni Participants

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We welcome representatives from 100 colleges and universities, informal science education institutions, non-profits, government agencies, school systems, and foundations.

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### SUSTAINABILITY AT SSI 2016

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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 messenger bags, tumblers which are reusable with both hot and cold beverages, and high-quality pens 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.
- Shuttles will run only during peak movement times in order to reduce the environmental impact of transporting participants.
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- 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 2016 SHUTTLE SCHEDULE, PARKING INFORMATION, AND STAFF LOCATIONS

### SSI 2016 SHUTTLE SCHEDULE

*Roosevelt University and the Fairmont Millennium Park Hotel are approximately one mile apart. It is approximately a 20-minute walk between them. However, in case of inclement weather and for your convenience, we will provide shuttles between the hotel and the campus.*

#### THURSDAY, JULY 28

*All Sessions will be held at Roosevelt University*

##### Morning and Afternoon

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 8:00 a.m., and ending at 4:30 p.m.

##### Evening – Following Dinner

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 7:30 p.m., and ending at 9:00 p.m.

#### FRIDAY, JULY 29

*All Sessions will be held at Roosevelt University*

##### Morning

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 7:00 a.m., and ending at 9:00 a.m.

##### Evening – Following the Poster Session

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 5:00 p.m., and ending at 8:00 p.m.

#### SATURDAY, JULY 30

*All Sessions will be held at Roosevelt University*

##### Morning

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 7:00 a.m., and ending at 9:00 a.m.

##### Evening – Following Dinner

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 5:00 p.m., and ending at 9:00 p.m.

**SUNDAY, JULY 31**

*All Sessions will be held at Roosevelt University*

Morning

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 7:00 a.m., and ending at 9:00 a.m.

Afternoon – For Sunday Activities

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 2:00 p.m., and ending at 4:00 p.m.

**MONDAY, AUGUST 1**

*All Sessions will be held at Roosevelt University*

Morning

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 7:00 a.m., and ending at 8:30 a.m.

Afternoon

Buses will transport SENCER Summer Institute participants between the Fairmont Millennium Park Hotel's Auto Lobby on B2 of the hotel and Roosevelt University's Wabash Building. Shuttles will run every 20-30 minutes, beginning at 12:00 p.m., and ending at 1:30 p.m.

**SSI 2016 PARKING INFORMATION**

Paid parking is available near the Roosevelt University Campus and paid valet parking is available in front of the Fairmont Millennium Park Hotel.

The closest parking to the Roosevelt University Campus is:

Park One

434 S. Wabash

Chicago, IL 60605

## SSI 2016 STAFF

### SSI 2016 On-Site Staff

#### **Hailey Chenevert, Manager, Informal Science Partnership Programs**

Hailey Chenevert works primarily with the SENCER-ISE (Science Education for New Civic Engagements and Responsibilities – Informal Science Education) initiative. In this capacity, she serves as part of the project leadership team, takes part in the review and distribution of partnership awards, liaisons with project advisors, consultants, and evaluators, and supports developing partnerships. Hailey brings experience in the informal education field from previous work with the Smithsonian Center for Folklife and Cultural Heritage. While at the Smithsonian, she worked with over 25 universities, the USDA, and the Association of Public and Land-grant Universities to create Campus and Community: Public and Land-grant Universities and the USDA at 150, a program for the 2012 Smithsonian Folklife Festival. Hailey holds a degree from Michigan State University, as well as a specialization in Museum Studies.

#### **Christine DeCarlo, SENCER and Engaging Mathematics Coordinator, Digital Media Manager**

Christine Marie DeCarlo supports SENCER programming and the Engaging Mathematics initiative, and manages NCSCE's digital media. Christine's professional background is in K-12 science education, communication, and assessment. Prior to joining NCSCE, she developed science test questions and instructional materials for Assessment Technology, Incorporated, and taught marine biology courses at Newfound Harbor Marine Institute. Christine graduated from the University of Pittsburgh with a bachelor's degree in biology and a certificate in Latin American studies.

#### **Kyle Simmons, Faculty Development Events Manager**

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.

### 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 **Wabash Building Room 1109**

### In Case of Emergency

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

## SSI 2016 AREA MAP AND SESSION LOCATIONS

### SHUTTLES AND STAFF

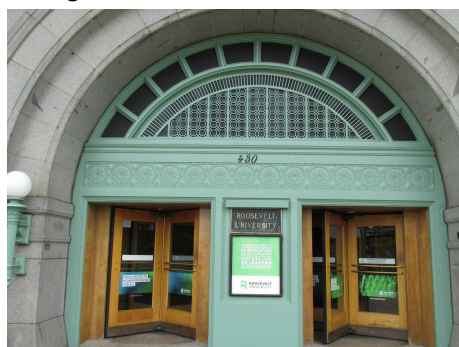
**The Fairmont Chicago Millennium Park Hotel is located at:**

200 North Columbus Drive  
Chicago, Illinois 60601

Roosevelt University is comprised of two main buildings - the Auditorium Building and the Wabash Building

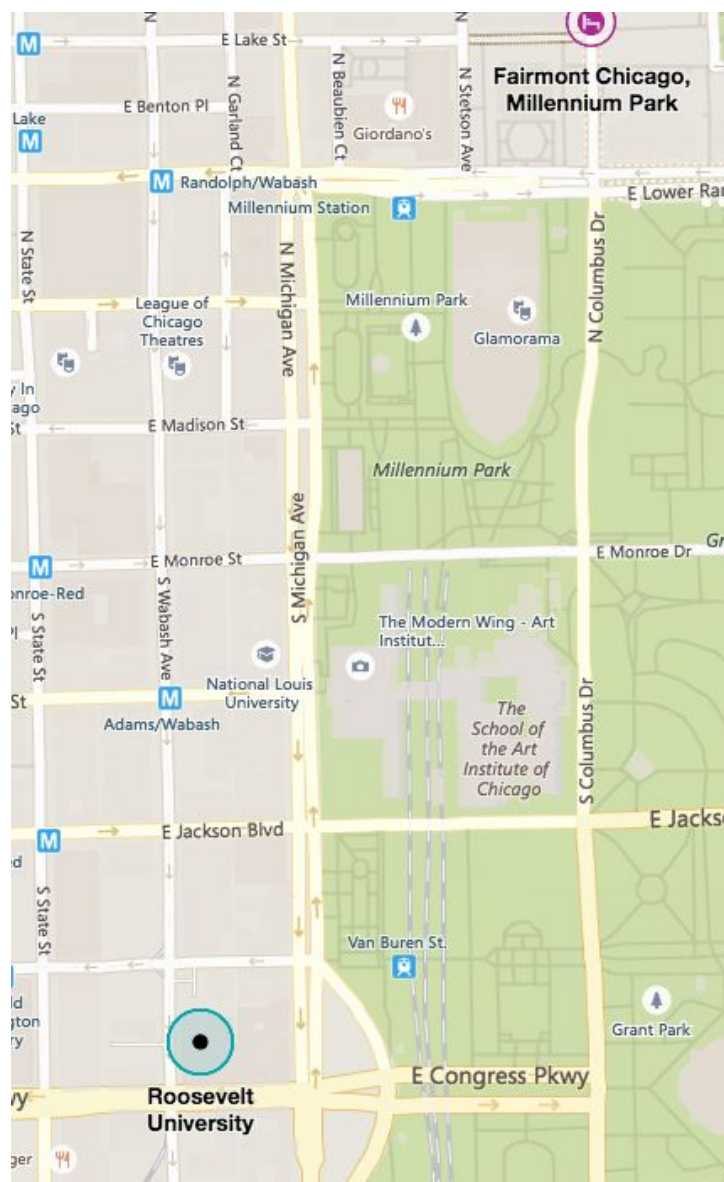
**The Auditorium Building is located at:**

430 S. Michigan Avenue  
Chicago, IL 60605



**The Wabash Building is located at:**

425 S. Wabash Avenue  
Chicago, IL 60605



### Session Locations:

All sessions located in rooms beginning with **AUD** will be in the **Auditorium Building**.

All sessions Located in rooms beginning with **WB** will be in the **Wabash Building**.

**Congress Lounge** is on the **second floor** of the **Auditorium Building**.

**Spertus Lounge** is on the **second floor** of the **Auditorium Building**.

**Fainman Lounge** is on the **second floor** of the **Auditorium Building**.

**Murray-Green Library** is on the **tenth floor** of the **Auditorium Building**.



## SENCER WORKBOOK: NOTE TAKING

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This workbook is an effort to turn your SENCER Summer Institute experience into something more lasting than the usual conference experience.

We all know how conferences usually go: you attend many wonderful sessions, meet great new colleagues with ideas and expertise that sound really useful to you, and collect brilliant new ideas you can't wait to try when you get home. You leave the conference happily exhausted: inspired and energized by all the sharing and learning you've done at the conference. You head home full of optimism and excitement. Then you arrive at your office, plop your conference packet down on your desk, get buried by accumulated emails and other work, and somehow never quite get around to implementing all those fabulous ideas you left the conference with. If, by some stroke of luck, you do find a few minutes to review your conference notes, they seem out of context and lack that spark of inspiration; you quickly feel overwhelmed by the details and end up just filing them away, in case you need to refer to them later. This workbook is an effort to break this cycle by helping you organize your conference experience—and notes—in ways that will make it easier for you to put what you learn into practice.

This workbook has four main sections:

1. A place to set goals and to organize the resources you'll need to achieve them;
2. Some worksheets to help organize the notes you take in the conference sessions and make them more immediately useful;
3. A space to review and reflect—because research shows that this is the single most important thing you can do to remember what you learned; and
4. A place to record action items you want to accomplish when you get home.

### **A One-Minute Warm-Up Exercise: Maintaining Healthy Habits**

Attending conferences can challenge the routines that keep us healthy at home unless we plan for those challenges and take proactive steps to maintain the habits that matter to us. Habits around things like sleep, exercise and diet strongly affect learning and mental performance in addition to wellbeing. If you have a fitness routine at home, will you make time at the SSI to exercise? If you've worked hard to build healthy eating habits at home, how will you resist temptation here? Take one minute to jot down some answers to these questions: What habits do you want to commit to while here? Which ones are okay to let go of until you get home?

**Establishing Purpose: A Three-Minute Freewrite**

Keep this short and sweet: set your phone to timer or stopwatch, or use your watch (with a second hand, please), to give you three minutes to answer the question below. Write whatever comes to mind and keep writing until your timer goes off. Don't overthink: the goal is just to come up with three to five things you want to take away from your time here. You don't need to write complete sentences, but do use verbs to ensure that your list is action-oriented. You may spend a couple of minutes revising after your timer goes off, but the point here is to capture a snapshot, not write an essay.

What do you hope to gain by attending this SENCER Summer Institute?

## Articulating Your Purpose: Setting Goals

Now that you have a sense of your overall expectations for the conference, it's time to set some concrete goals. These pages ask you to identify three specific goals or objectives that you hope to achieve at this SSI. To keep your goals grounded and attainable, it is often useful to think about them in terms of things you hope to accomplish in the next two to six months.

### Goal or Objective #1:

#### Sessions related to this goal or objective:

Session title:

Presenter's Name(s):

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**Preliminary thoughts related to this goal or objective: What are you looking for and/or hoping to find?**

#### Networking related to this goal or objective:

Who did you meet?

What did you talk about?

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**Notes related to Goal or Objective #1:**

This is a place for you to put notes or thoughts related to goal or objective #1 as they come up.

NOTE  
TAKING

## Goal or Objective #2:

### Sessions related to this goal or objective:

Session title:

Presenter's Name(s):

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**Preliminary thoughts related to this goal or objective: What are you looking for and/or hoping to find?**

### Networking related to this goal or objective:

Who did you meet?

What did you talk about?

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**Notes related to Goal or Objective #2:**

This is a place for you to put notes or thoughts related to goal or objective #1 as they come up.

**Goal or Objective #3:**

**Sessions related to this goal or objective:**

Session title:

Presenter's Name(s):

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**Preliminary thoughts related to this goal or objective: What are you looking for and/or hoping to find?**

**Networking related to this goal or objective:**

Who did you meet?

What did you talk about?

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**Notes related to Goal or Objective #3:**

This is a place for you to put notes or thoughts related to goal or objective #1 as they come up.



## Worksheets: Metacognitive Note-Taking for Better Retention

**To Begin:** This approach to note-taking can make your time taking notes more effective because it is based on how you learn. Whenever you start a new section of notes, write the Date, Course/Session & Topics on the top of the page, then draw a line down the middle of the page, 1/4 or 1/3 the way from the left edge. At the end of each session, take 5 minutes to summarize what you most want to remember and follow up on.

Date:	Course/Session:	Topics:
<b>Objectives:</b> <i>Putting this information at the top of the page primes your brain with what you already know about these topics, making it faster and easier for you to make new connections. It also makes it easier to keep your notes organized. Under <u>Objectives</u>, note which of your conference objectives you want to work on in this session. Also note session goals here.</i>		
<b>Reflections/Comments</b> <b>Reflections:</b> <i>Use this space for noting your reactions and responses to what happens during the session. Make sure you capture your emotional responses, since they have the largest effect on your ability to recall what happened.</i>  <i>Write or draw, include your feelings, questions, emerging ideas and other comments. Note items to follow up on here too.</i>  <i>When you review, your associations with how you experienced what happened will make it easier to remember. What you put in this column acts as a key and an index, aiding recall.</i>  <i>This section keeps your note-taking active and metacognitive.</i>	<b>Notes</b> <b>Notes:</b> <i>Use this space for taking notes on what is being presented, using whatever method you like. These are notes on content.</i>	
	<b>Summary:</b> <i>Here's where brain-based research really kicks in. At the bottom of your notes for each talk, draw a line below your notes to write a summary. As soon as possible after the talk (but in any case, before you sleep), take 3-5 minutes to write a summary of what you want to remember from these notes. Writing your summaries before you sleep will help solidify the new neural connections you want to keep.</i>  <i>If you review your summaries within 24 hours, you do even more to move what you learned from short term to long term memory.</i>  <i>When you review your notes, in most cases all you'll need to review is your summaries. Not sure what to write in the summary? One of the easiest ways to do it is in 3 sentences:</i> 1) summarize what the speaker is proposing you think about or do differently 2) reference the key supports for the proposition 3) <b>make a bulleted list of what you most want to remember later ** most valuable</b>  <i>Then create appropriate items in your calendar and to do lists.</i>	
<b>Summary:</b>		

## Review of Metacognitive Note-Taking in Order of Importance:

- 1) Writing a summary is the most important thing you can do to help you retain what happened in a session.
  - a. Keep the summary short so that you will do it and so that you won't overthink. This is supposed to be a summary, not a recapitulation of the material. Part of the value of the process comes from the fact that you have to decide what is most important.
  - b. Write your summary as close to the end of the session as possible. Ideally, you want to write the summary before you attend the next session. In any case, you want to write it before you sleep, since one important function of sleep is to erase non-essential information accumulated during the day (and if you haven't marked the things that happened in the session as important, they are likely to be deleted). Another important function of sleep is to consolidate and file memories, so again, having that summary written before you sleep helps your brain process it appropriately.
  - c. Reviewing your summary within 24 hours helps move what you learned from short-term to long-term memory. (Regular, repeated review is the best way to learn/remember anything.) After writing the summary, this is the next-most important thing you can do to help you retain what you learned.
  - d. Ideally, you write a summary for every 40-45 minutes worth of material in a lecture of average density. A summary for every two pages of notes is about right.
- 2) The second-most important thing you can do to help you retain what you learned in a session is to make your note-taking actively metacognitive.
  - a. Making your note-taking dialectical keeps your brain actively looking for connections—and making connections is how learning works.
  - b. Paying attention in this way helps keep you engaged and motivated.
  - c. Making your note-taking active helps prevent you from becoming passive—a state in which learning is not possible.
  - d. The mental “soundtrack” that you record in the left column is a far better aid to recall than the content itself. Recording your emotional responses is especially effective in this regard because along with repetition, emotions have the biggest influence on your ability to recall.
  - e. Writing down questions and reactions provides armatures for future reflection and further learning.
- 3) Writing header information at the top of the page facilitates learning.
  - a. Reviewing what you know about the topic moves existing knowledge into working memory, making access to that knowledge easier and faster. This improves your ability to make connections between existing knowledge and what happens in the session.
  - b. Writing out your objectives before you start keeps you focused on what you want to learn.

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

Reactions/Comments

Notes

NOTE  
TAKING

Summary:

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

NOTE  
TAKING

Reactions/Comments

Notes

Summary:

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

Reactions/Comments

Notes

NOTE  
TAKING

Summary:

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

NOTE  
TAKING

Reactions/Comments

Notes

Summary:

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

Reactions/Comments

Notes

NOTE  
TAKING

Summary:

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

NOTE  
TAKING

Reactions/Comments

Notes

Summary:



Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

Reactions/Comments

Notes

NOTE  
TAKING

Summary:

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

NOTE  
TAKING

Reactions/Comments

Notes

Summary:

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

Reactions/Comments

Notes

NOTE  
TAKING

Summary:

Date: \_\_\_\_\_ Course/Session: \_\_\_\_\_ Topic: \_\_\_\_\_

**Objectives for this session:**

NOTE  
TAKING

Reactions/Comments

Notes

Summary:

**Review and Reflect:****Reflections for Thursday**

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

**Reflections for Friday**

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

**Reflections for Saturday**

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

**Reflections for Sunday**

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

**Reflections for Monday,**

This is a place for you to synthesize ideas and reflect on what you have gained outside of the context of your specific goals and session notes. Emergent occasions often generate the most valuable learning—write about those occasions here.

**Action Items:**

This is a place to plan specific actions for the near future. Items might include books or resources to order, people to contact, course changes to make, materials to work on, etc. List at least five things you will do within two weeks of your return home. Having a short list of items directly related to your purposes for attending the conference should help you maintain the energy and momentum you developed at the SSI.

1)

2)

3)

4)

5)

# SENCER Summer Institute 2016 Schedule at a Glance

Thursday, July 28, 2016		
Time	Event	Location
7:00 AM - 4:00 PM	SSI 2016 Check-in	Fainman Lounge
9:00 AM - 11:00 AM	Invitational Strategic Planning Group Meeting	Aud 430
12:00 - 2:00 PM	SCI Co-Director Meeting	AUD 430
2:00 - 4:00 PM	SENCER Summer Institute New Participant Orientation	Congress Lounge
4:30 PM - 6:30 PM	SENCER Summer Institute 2016 Opening Plenary Address	Congress Lounge
6:30 PM - 8:00 PM	SENCER Summer Institute Opening Gala Dinner	Murray-Green Library
Friday, July 29, 2016		
7:00 - 8:30 AM	Breakfast	Dining Center
8:30 - 11:00 AM	All-Institute Plenary Session II	Congress Lounge
11:00 - 11:50 AM	Session Block I	Roosevelt Classrooms
12:00 - 12:30 PM	Demonstration from G. Wiz	Congress Lounge
12:45 PM - 1:15 PM	Lunch	Dining Center
1:15 - 2:15 PM	Team Time, Individual Rep. Session, and Initiative Meetings	Roosevelt Campus
2:30 - 5:30 PM	Session Block II	Roosevelt Classrooms
5:30 - 7:30 PM	Poster Presentations	Fainman Lounge
Saturday, July 30, 2016		
7:00 - 8:30 AM	Breakfast	Dining Center
8:30 - 11:00 AM	All-Institute Plenary Session III	Congress Lounge
11:00 AM - 12:00 PM	Team Time, Individual Rep. Session, and Initiative Meetings	Roosevelt Campus
12:00 - 1:15 PM	Lunch	Dining Center
1:15 - 3:05 PM	Session Block III	Roosevelt Classroom
3:30 - 5:20 PM	Session Block IV	Roosevelt Classrooms
5:30 - 7:00 PM	Dinner Recognizing Achievements in the NCSCE Community	Murray-Green Library
Sunday, July 31, 2016		
7:00 - 8:30 AM	Breakfast	Dining Center
8:30 - 11:00 AM	All-Institute Plenary Session IV	Congress Lounge
11:00 AM - 12:15 PM	Brunch	Dining Center
12:30 - 2:30 PM	Session Block V	Roosevelt Classrooms
2:30 PM	Afternoon Activities	Chicago Area
Monday, August 1, 2016		
7:00 - 8:00 AM	Breakfast	Congress Lounge
8:00 - 9:50 AM	Session Block VI	Roosevelt Classrooms
10:00 AM - 12:00 PM	All-Institute Plenary Session V and Closing Thoughts	Congress Lounge
12:00 - 1:00 PM	Lunch	Dining Center

*Friday - Monday during sessions, the SENCER Cafe will be open in Fainman Lounge  
for participants to mingle and get refreshments*



# SENCER Summer Institute 2016 Daily Schedules at a Glance

## AT-A-GLANCE SCHEDULES

Time	Thursday 7/28	
7:00 AM	Check-in (7:00 AM - 4:00 PM) - <b>Fainman Lounge (2nd floor of auditorium building at 430 S. Michigan)</b>	
7:30 AM		
8:00 AM		
8:30 AM		
9:00 AM		Strategic Planning Meeting (9:00 - 11:00 AM) - <b>AUD 430</b>
9:30 AM		
10:00 AM		
10:30 AM		
11:00 AM		
11:30 AM		SCI co-Director Meeting (12:00 - 2:00 PM) - <b>AUD 430</b>
12:00 PM		
12:30 PM		
1:00 PM		New Participant Orientation (2:00 - 4:00 PM) - <b>Congress Lounge</b>
1:30 PM		
2:00 PM		
2:30 PM		
3:00 PM		
3:30 PM		
4:00 PM		
4:30 PM	Sean Gehrke Opening Plenary Address (4:30 - 6:30 PM) - <b>Congress Lounge</b>	
5:00 PM		
5:30 PM		
6:00 PM		
6:30 PM	Dinner 6:30 -8:00 PM) - <b>Murray Green Library</b>	
7:00 PM		
7:30 PM		

# SENCER Summer Institute 2016 Daily Schedules at a Glance

Time	Friday 7/29							
7:00 AM	Breakfast (7:00 - 8:30 AM) - Dining Center (Second floor of Wabash building)							
7:30 AM								
8:00 AM								
8:30 AM	April Hill Plenary Address (8:30am -11:00 AM) - Congress Lounge							
9:00 AM								
9:30 AM								
10:00 AM								
10:30 AM								
11:00 AM								
11:30 AM	The SENCER Model Series: New Developments, New Formats - AUD 420	Assessing for Student Success: Getting Started with the SENCER-SALG - AUD 528	SENCER and the Community College Curriculum: From Pipeline to Pathways - AUD 628	Students, Science Literacy, and Social Media: Participating in Broader Conversations - AUD 426	SENCER: Teaching STEM with Design Thinking by Susan Reiser - AUD 430	Creating a Global Initiative on Campus: Strategy, Design and Implementation - AUD 434	H.E.R.O.E.S. - Helping Educate, Re-energize, and Organize Environmental Stewards - AUD 326	SENCER Cafe - Fainman Lounge
12:00 PM	G. Wiz Presentation - Congress Lounge							
12:30 PM	Lunch (12:30- 1:15pm) - Dining Center							
1:00 PM								
1:30 PM	Team Time, Consultations (1:15- 2:15pm)						Session for Individual Representatives - AUD 420	
2:00 PM								
2:30 PM	Integrating Discovery-Based Research into the Undergraduate Curriculum - AUD 528	SENCER through the K-12 Perspective: Natural Phenomena, Civic Engagement, and the Next Generation Science Standards (NGSS) - AUD 628	Part I: Introduction to the Scholarship of Teaching and Learning (SoTL) - AUD 426	Designing a SENCER Course in 90 Minutes - AUD 420	Civic Engagement and Professional Development: Toward a SENCERized Faculty: - AUD 430	The Impact of Cross-Sector Partnerships for STEM Learning: SENCER-Infomal Science Education and Beyond - AUD 434		
3:00 PM			Teaching as Research, Part II: Applying SoTL Principles to Curriculum Development - AUD 426	Strategies for Departmental Transformation: Lessons from the SENCER and PULSE Projects - AUD 420	Coaching Change Agents: Planning, Implementing, and Sustaining Reforms - AUD 430			
3:30 PM								
4:00 PM								
4:30 PM								
5:00 PM			Poster Presentations (5:30 - 7:00PM) - Fainman Lounge					
5:30 PM								
6:00 PM								
6:30 PM								



# SENCER Summer Institute 2016 Daily Schedules at a Glance

Time	Sunday 7/31							
7:00 AM	Breakfast (7:00 - 8:30 AM) - <b>Dining Center (Second floor of Wabash building)</b>							
7:30 AM								
8:00 AM								
8:30 AM	Cindy Kaus Plenary Address (8:30 - 11:00 AM) - <b>Congress Lounge</b>							
9:00 AM								
9:30 AM								
10:00 AM								
10:30 AM								
11:00 AM	Brunch - <b>Dining Center</b>							
11:30 AM								
12:00 PM								
12:30 PM	Implementation of Civic Engagement in Biology Courses: Assessment Strategies and Outcomes - <b>AUD 320</b>	Controversial Public Policy Questions in an Election Year - <b>AUD 628</b>	Dean's Forum - <b>AUD 420</b>	Transformative Sustainability: STARS, SENCER, and the Future of the University - <b>AUD 528</b>	Science Education and Civic Engagement: An International Journal - <b>AUD 426</b>	STEAM Cleaned: Fostering Collaborations Between STEM and Humanities Through the Topic of Clothing - <b>AUD 430</b>		
1:00 PM					Pop-Up (Mobile) Chem Lab - <b>AUD 426</b>	How STEM Became STEAM and Everyone Won: Incorporating Humanities in STEM Disciplines - <b>AUD 430</b>		
1:30 PM	Differentiating Instruction for All Learners in the STEM Classroom - <b>AUD 320</b>	Assessing for Student Success: Getting Started with the SENCER-SALG - <b>AUD 628</b>	Designing Open Inquiry Laboratories for K-12 Students: It Needn't be Chaotic - <b>AUD 420</b>	Full Circle: Creating Learning Opportunities through Constructive Feedback - <b>AUD 528</b>	Science Literacy for the 21st Century: An Institutional Initiative to Foster Science-Informed Decision-Making about Food, Energy, and Water - <b>AUD 434</b>	The Science Behind Digital Design - <b>AUD 326</b>	The Benefits of Teaching a Project Based Learning (PBL) Organismal Biology Course at a Community College - <b>AUD 330</b>	SENCER Cafe <b>Fainman Lounge</b>
2:00 PM					A collaboration between a 2-year college and a 4-year institution on an introductory Biochemistry laboratory course based on Project Based Learning - <b>AUD 434</b>	A Math Learning Environment that Nourishes General Education - <b>AUD 326</b>	GEARing UP with SENCER in K-12 - <b>AUD 330</b>	
2:30 PM	<b>Afternoon Activities</b> (Begin at 2:30 PM)							
3:00 PM								
3:30 PM								
4:00 PM								
4:30 PM								
5:00 PM								
5:30 PM								
6:00 PM								

## SENCER Summer Institute 2016 Daily Schedules at a Glance

Time	Monday 8/1					
7:00 AM	Breakfast (7:00 - 8:00 AM) - Dining Center (Second floor of Wabash building)					
7:30 AM						
8:00 AM	Documenting Achievements: How to Use Portfolios as a Professional Development Tool - AUD 320	The Carbon Cycle Game - AUD 420	Designing Discussion Prompts for Cognitive Growth - AUD 528	TWU Pollinator Garden Project - AUD 628	CAPS: A Never Ending Resource in Teaching and Learning STEM Education - AUD 426	SENCER Cafe - Fainman Lounge
8:30 AM				Chicago Transportation Authority Bacterial Detectives - AUD 628	Incorporating Photo-Book of Concepts in Physics and Environmental Chemistry Classes - AUD 426	
9:00 AM		Regionalization Strategies for SENCER's National "Community of Transformation" - AUD 420	MetaLearning: Growing Self-Directed Learners - AUD 528	The New York State STEM Quality Learning Rubric and its Application to SENCER Work - AUD 430	The Engaged Faculty Fellows Program - AUD 434	
9:30 AM				Working with Social Media and Case Studies - AUD 430	Adding College Students to an Existing inner city Community Garden - AUD 434	
10:00 AM	Alix Fink Plenary Address and David Burns Closing Address - Congress Lounge					
10:30 AM						
11:00 AM						
11:30 AM						
12:00 PM	Lunch - Dining Center					
12:30 PM						

## THURSDAY, JULY 28TH

### **Notes on the Program**

*All sessions will be held at Roosevelt University*

*Shuttles are available to the Roosevelt campus from the Fairmont Millennium Park hotel. A schedule is included in the front of the program book.*

#### **7:00 A.M. – 4:00 P.M. 2016 SENCER SUMMER INSTITUTE CHECK-IN**

*Fainman Lounge - Second Floor of the Auditorium Building*

All SSI 2016 participants and facilitators should check in with SSI staff upon arrival at Roosevelt University to receive SSI materials, including printed copies of the SSI program, name badges (which are required for access to SSI meals and events), a messenger bag, and a reusable mug for both hot and cold drinks.

#### **9:00 A.M. – 11:00 A.M. STRATEGIC PLANNING GROUP MEETING**

*AUD 430*

This meeting for NCSCE Strategic Planning is by invitation only.

#### **12:00 P.M. – 2:00 P.M. SCI CO-DIRECTOR MEETING**

*AUD 430*

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

#### **2:00 P.M. – 4:00 P.M. SSI 2016 NEW PARTICIPANT ORIENTATION**

*Congress Lounge*

The SSI 2016 New Participant Workshop will be an opportunity for those new to the SENCER community and the Summer Institute to learn more about our work, network with other new participants before the Institute begins, and get tips for making the best of your SSI experience.

#### **4:30 P.M. – 6:30 P.M. SSI 2016 OPENING PLENARY SESSION**

*Congress Lounge*

Robert Seiser, presiding

#### **Welcome**

Bonnie Gunzenhauser, bgunzenhauser@roosevelt.edu

Dean of Arts and Sciences

*Roosevelt University*

#### **Taking Notes and Note Taking: Making the SSI Learning Experience More Durable**

Stephen Carroll, scarroll@scu.edu

Senior Lecturer

*Santa Clara University*

THURSDAY,  
JULY 28

**Plenary Presentation: Creating Communities of Transformation in STEM Education:  
Lessons from Research**

Sean Gehrke, [sjgehrke@lcsc.edu](mailto:sjgehrke@lcsc.edu)

Director of Institutional Planning, Research, and Assessment

*Lewis-Clark State College*

**Plenary Response: Maximizing the Impact of Transformation through Collaboration**

Marsha Semmel, [marsha.semmel@gmail.com](mailto:marsha.semmel@gmail.com)

Senior Advisor

*SENCER - Informal Science Education*

**Plenary Response: Supporting Transformation Across the Curriculum at Roosevelt University**

Robert Seiser, [rseiser@roosevelt.edu](mailto:rseiser@roosevelt.edu)

Associate Professor of Biology and Chemistry

SENCER Center for Innovation – Midwest Co-Director

*Roosevelt University*

**Aims for SSI 2016**

Wm. David Burns, [david.burns@sencer.net](mailto:david.burns@sencer.net)

Executive Director

*National Center for Science and Civic Engagement (NCSCE)*

**6:30 P.M. – 8:00 P.M.**

**SSI 2016 GALA WELCOME DINNER**

*Murray-Green Library*

Murray-Green Library, the site of tonight's dinner, is located on the 10th floor of the auditorium building. NCSCE Staff will lead the group up to the library.

## FRIDAY, JULY 29TH

### Notes on the Program

All sessions will be held at Roosevelt University

Shuttles are available to the Roosevelt campus from the Fairmont Millennium Park hotel. A schedule is included in the front of the program book.

**7:00 A.M. – 8:30 A.M.**

**BREAKFAST**

Dining Center

**8:30 A.M. – 11:00 A.M.**

**ALL-INSTITUTE PLENARY SESSION II**

Congress Lounge

Eliza Reilly, presiding

**Plenary Presentation: SENCER, Transforming STEM for Majors, and It's About Time, Too**

April Hill, ahill2@richmond.edu

Professor and Chair of Biology

University of Richmond

**Plenary Response: Assessing the Impact of Curricular Change**

Stephen Carroll, scarroll@scu.edu

Senior Lecturer, English Department

Santa Clara University

**Plenary Response: Expanding Opportunities for Undergraduate Research**

Jay Labov, jlabov@nas.edu

Senior Scientist and Program Director for Biology Education

National Academies of Sciences, Engineering, and Medicine

**11:00 A.M. – 11:50 A.M.**

**SESSION BLOCK I (CONCURRENT SESSIONS)**

### A NOTE ON THE SSI 2016 PROGRAM FOCUSES

In order to help you identify sessions that fall into particular areas of focus for our program this year, 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-based approaches to learning
2. Academic Leadership Development – Sessions on aligning the SENCER approach with your personal and institutional goals
3. Community Collaborations – Sessions about SENCER work done in concert with local communities
4. SENCER Across the Curriculum – Sessions about courses and programs that combine aspects of both STEM and Humanities courses
5. Applying SENCER to K-12 Education Challenges – Sessions which address the connections between the SENCER approach and the K-12 educational context.

FRIDAY,  
JULY 29



## A NOTE ON THE SSI 2016 SESSION BLOCKS

This year we have put together several session blocks during which sessions of different lengths will run concurrently. The sessions range in length from 20 minutes to 3 hours. This new approach to scheduling emerges from feedback from past symposia evaluation and from conversation with many members of the community.

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.

The 50-minute concurrent sessions and 80-minute work sessions allow for members of the SENCER community to share learning opportunities about their work at a targeted scale and will give participants takeaways applicable at their home institutions.

The two and three-hour workshop sessions will introduce newcomers to basic elements of the SENCER approach, offer hands-on training on active-learning pedagogies and assessment, and provide alumni with opportunities to apply the SENCER approach to new challenges on a larger scale than the shorter sessions.

All sessions within blocks will allow for 10 minutes of passing time between each.

While there are multiple opportunities to pursue thematic interests (themes are identified in program descriptions), individual sessions, except for the SENCER-SALG introduction, are not repeated. Choosing which sessions to attend can be challenging. Teams can make the most of the SSI experience by deploying individual members to different sessions.

FRIDAY,  
JULY 29

### **The SENCER Model Series: New Developments, New Approaches**

AUD 420

Focus: Teaching and Learning

Eliza Reilly, [eliza.reilly@ncsce.net](mailto:eliza.reilly@ncsce.net)

*National Center for Science and Civic Engagement*

Since the project's inception in 2001, the SENCER Model Series has provided courses and programs that exemplify the SENCER ideals for STEM learning. They are offered as guides and inspiration to faculty seeking to improve their practice by teaching STEM content "through" civic questions. From the original four "models" there are now over fifty courses and programs addressing a wide range of disciplinary content and pedagogical frameworks. This session will introduce the 2016 SENCER models, including the first engineering course, a course on forensic science, and an epidemiology course for biology and biochemistry majors. The session will also feature updated content that has been added to models from previous years. Participants will have an opportunity to meet both new and past model "authors" and to hear about the evolution of the model series over the last seventeen years of the SENCER project.

## Assessing for Student Success: Getting Started with the SENCER-SALG

AUD 528

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 effectively. Working directly with the SENCER-SALG website, participants will learn how to set up survey instruments for their own classes, administer the surveys, and interpret the results. Participants will also learn how to customize the instrument to include both their own course goals and SENCER's programmatic goals. This session is especially geared for those new to the SENCER-SALG.

*Note: if your team or group is not familiar with the SALG, we suggest one member attend one of the two SALG sessions. Use of the SALG is required on Post-Institute Implementation Award applications that involve courses or academic programs. The next session will be Sunday, 1:30-2:20 p.m.*

## SENCER and the Community College Curriculum: From Pipeline to Pathways

AUD 628

Theo Koupelis, tkoupeli@broward.edu

Broward College

Bob Franco, bfranco@hawaii.edu

Kapi'olani Community College

Jay Labov, jlabov@nas.edu

National Academies of Sciences, Engineering, and Medicine

In recent years the metaphor of "pathways" has replaced the more impersonal "pipeline" as a description of the students' passage through post-secondary education on their way to jobs and careers. The American Association of Community Colleges has formalized the concept in its Gates Foundation funded Pathways Project, which now includes hundreds of two-year institutions across the country. The first part of this session will describe the Pathway Project and its theoretical assumptions, while highlighting some of its drawbacks, including the implications for the community college curriculum and the possible displacement of the values and goals of a liberal arts education in favor of vocational training.

This session will then explore ways that the SENCER approach could ameliorate some of the concerns about the Pathways Project by helping to integrate disciplinary content while supporting development of students' civic capacity, better preparing them for both the workforce and citizenship in a democratic society.

Panelists will responses to the Pathways Project, including efforts at Broward College. It will also explore the University of Hawaii's "SENCER-ized" approach, focusing on baccalaureate transfer, careers, and preparing students for lives of informed, engaged citizenship. The session will conclude with findings from a new report from the National Academies of Sciences, Engineering, and Medicine that analyzes both the barriers and opportunities to supporting students as they pursue their diverse "pathways" through 2-and 4-year institutions.

FRIDAY,  
JULY 29

**Students, Science Literacy, and Social Media: Participating in Broader Conversations**

AUD 426

Focus: Teaching and Learning

Andrea Aust, [aaust@kqed.org](mailto:aaust@kqed.org)

KQED

This session will address the implementation of social media and simple media production as tools to engage students in civic discourse through KQED's *Do Now U* project. Do Now U provides students with a platform to discuss current, engaging scientific and health issues, like eradicating global diseases, installing artificial turf fields and the Flint water crisis, through social media. Students research topics, share their thoughts, respond to each other's ideas, craft multimedia arguments and search for online publications to support their claims. They move from being purely consumers of media to active participants in conversations, often times looking at a national issue through the lens of their local communities.

Participants in this session will walk through the *Do Now U* process, which includes reading a short article about a current scientific topic, reviewing a featured media resource and then responding to a question about the topic via Twitter or a comment on the KQED website. A small group of professors and classrooms in the SENCER community piloted the development of *Do Now* posts in the 2015-2016 school year. The topics of the *Do Now U* posts are chosen by college students for their peers. Various forms of student responses (e.g. tweets, comments, blog posts, infographics) to the posts will be reviewed as examples. Session participants will be introduced to ways that students can illustrate their viewpoints using a variety of free media-making tools. There will be time for discussion about incorporating social media into formal learning environments and best practices for using *Do Now U* with students.

Note: Please bring your computer and/or mobile device (tablet, smartphone) to the workshop.

**SENCER: Teaching STEM with Design Thinking**

AUD 430

Focus: Teaching and Learning

Susan Reiser, [reiser@unca.edu](mailto:reiser@unca.edu)

UNC Asheville

Kathleen deLaski, [kathleendelaski@gmail.com](mailto:kathleendelaski@gmail.com)

Education Design Lab

Employers want the 4 C's: communication, critical thinking, creativity, and collaboration. SENCER and design thinking cultivate those desired skills in STEM courses. The presenters, long-term proponents and practitioners of user-centered design, will introduce design thinking — the process of tackling challenges from the human needs outward — and show examples of the intersection of design thinking and SENCER in STEM courses. They will also provide examples of how universities are experimenting with assessing the 4 Cs and providing micro-credentials for students. In small groups, attendees will apply design thinking to one of their own curricular challenges. Participants will be invited share their solutions and receive feedback from the facilitators and other attendees.

## Creating a Global Initiative on Campus: Strategy, Design and Implementation

AUD 434

Focus: Community Collaborations

Karen Oates, koates@wpi.edu

Worcester Polytechnic Institute

This session will discuss the challenges and opportunities of “globalizing” the university campus. To be effective campus globalization efforts must go beyond study abroad, or a research projects between investigators in different countries. Rather, globalization is the process by which regional and international systems, including systems of higher education, become integrated and interconnected. In this session we will explore how our actions in teaching, research and service, and co-curricular activities contribute to a globalized system that integrates campus, country, and an internationally diverse community of alumni.

## H.E.R.O.E.S. - Helping Educate, Re-energize, and Organize Environmental Stewards

AUD 326

Focus: Applying SENCER to K-12 Education Challenges

Becky Collins, becky.collins@lipscomb.edu

Ginger Reasonover, ginger.reasonover@lipscomb.edu

Lipscomb Academy Elementary School

The nationally recognized Lipscomb Academy Elementary School Green Team program connects STEM activities with service learning, encouraging the youngest students to grow into civic-minded adults. During 2015-16 school year, the team focused on four areas: training themselves about energy resources, extending the team’s recycling efforts, shielding the revitalized campus stream from destruction, and expanding the team’s outreach from the school community, into the city, around the country, and across the world. In this session, presenters Becky Collins and Ginger Reasonover will provide background information about the program, lead hands-on activities, and provide discuss wider applications of the program and its aspects.

**12:00 P.M. – 12:30 P.M.**

**DRAMATIC DEMONSTRATIONS TO ENGAGE LARGE CLASSES**

Congress Lounge

Garon Smith, garon.smith@mso.umt.edu

University of Montana

A fun way to demonstrate the scientific process is to simulate its practice within a classroom or public presentation setting. The presenter (in the guise of G. Wiz) will share with participants several of his favorite potions that promote audience participation in observing physical phenomena, formulating a hypothesis, and then testing the hypothesis. Part of the lesson’s value is in deliberately choosing a wrong hypothesis to test. In repeating the demonstration, even though the original hypothesis is faulty, most audience members quickly identify a better explanation for the result after the second time. It is important to help students understand that in performing experimental replications, the brain is subconsciously processing information at a sophisticated level. Planned demonstrations include an ink-making spell, a freezing spell, and a magical mathematics trick. The presenter hopes that, as a result of attending this session, participants will be encouraged to employ similar activities in a variety of venues to more effectively engage their science audiences. Ideally, those interested in this approach will form an informal group to share ideas and success stories, and enlarge the collection of useful demonstrations.

FRIDAY,  
JULY 29

**12:30 P.M. – 1:15 P.M.****LUNCH***Dining Center***1:15 P.M. – 2:15 P.M.****TEAM TIME, TEAM CONSULTATIONS, AND INITIATIVE MEETINGS****Team Time**

*Teams may find any suitable location on campus to conduct a team meeting. If you requested a team consultation on your SSI 2016 application, please meet Kyle in The Dining Center to be matched with your consultant.*

**Man, Monkeys, and Article 15:***AUD 420*

Wm. David Burns, david.burns@sencer.net  
National Center for Science and Civic Engagement

**Note: This is a special option for newcomers who are not part of teams.**

“I give them my leftovers like roti but then they ran away with my onions.”

David Burns, the SENCER Principal Investigator and NCSCE Executive Director, would like to get to know you and, through hearing your reactions and suggestions about SSI 2016, enable you to help shape next year’s SSI. Towards that end, we invite you to join him. Together we will work on a real problem, a perfect example of “multidisciplinary trouble”— to use June Osborn’s memorable phrase: the growing population of monkeys in New Delhi. We did this last year and it was, to use a technical term, a “blast.” Not only that, real knowledge production occurred. We hope the same will be true for this year’s sessions.

We plan to work together on this complex, capacious, and as of now unsolved problem that has many dimensions: human and animal behavior; urban ecology; invasive species or sacred being (or both, depending on your point of view); religious belief and practice; challenges in urban planning, public policy, economics, power, and inequality; and, human rights, specifically the right to enjoy the benefits of science (Article 15), but also the right to one’s religious beliefs and practices.

We’ll watch a brief video, divide into teams, identify the various experts among us who can help, and then work together during this work session and Saturday’s to see if we can learn something, have fun doing so, and maybe even come up with some promising answers to a most interesting and vexing problem. While we are doing so, you will learn a bit more about the SENCER approach.

For background reading on man, monkeys and New Delhi, see:

<http://www.nytimes.com/2012/05/23/world/asia/fed-by-indians-monkeys-overwhelm-delhi.html>.

For background reading on Article 15 (“to enjoy the benefits of scientific progress and its applications”) of the International Covenant on Economic, Social and Cultural Rights (ICESCR), see: [http://shr.aaas.org/Programs/program\\_article15.htm](http://shr.aaas.org/Programs/program_article15.htm).

We look forward to seeing you.

**2:30 P.M. – 5:30 P.M.**

**SESSION BLOCK II**

**2:30 P.M. – 5:30 P.M.**

**WORKSHOPS**

**Integrating Discovery-Based Research into the Undergraduate Curriculum**

*AUD 528*

**Focus: Teaching and Learning**

Jay Labov, jlabov@nas.edu

*National Academies of Sciences, Engineering, and Medicine*

Cathy Middlecamp, chmiddle@wisc.edu

*University of Wisconsin, Madison*

The 2012 report, "Engage to Excel," from the President's Council of Advisors on Science and Technology (PCAST) urges the STEM education community and funding agencies to "provide support for replacing standard laboratory courses with discovery-based research courses." Emerging evidence suggests that engaging undergraduates in discovery research as early as possible during their undergraduate years is one of the best strategies for supporting and retaining STEM students and improving aspects of scientific literacy. But providing all students with individualized mentored research experiences, one of the traditional routes to a career in science, is not possible given the large numbers of beginning STEM students and limitations in lab space, supply budgets, and available research mentors. Acting on the PCAST recommendation, many undergraduate STEM educators are now experimenting with various strategies for engaging more students in research, and a variety of tested models are emerging. These successes are catalyzing interest in replacing standard "cook-book" laboratories with discovery-based research and related activities in labs associated with lecture courses or in stand-alone laboratory courses, utilizing on-campus, off-campus, and on-the-web resources.

This interactive session will engage participants in a discussion of key questions surrounding the integration of undergraduate research, including: Is our current knowledge base robust enough to recommend best practices? Is offering such experiences actually beneficial for all undergraduates? What institutional changes will be required to make such opportunities available to large numbers of students? Can such programs drive institutional change? How can we manage the cost/benefit parameters of such programs?

The session also will consider how the SENCER philosophy and approach meshes with emerging research on efforts to improve undergraduate STEM education. The report is available for electronic download without cost at <http://www.nap.edu/catalog/21851>. Session participants will receive a printed copy of the report.

**FRIDAY,  
JULY 29**

## **SENCER through the K-12 Perspective: Natural Phenomena, Civic Engagement, and the Next Generation Science Standards (NGSS)**

*AUD 628*

Focus: Applying SENCER to K-12 Education Challenges, Teaching and Learning

Kathleen Browne, [browne@rider.edu](mailto:browne@rider.edu)

*Rider University*

Monica Devanas, [devanas@ctaar.rutgers.edu](mailto:devanas@ctaar.rutgers.edu)

*Rutgers University*

Jessica Monaghan, [jessica\\_monaghan@nbpsnj.net](mailto:jessica_monaghan@nbpsnj.net)

*New Brunswick Public Schools*

The NGSS have been adopted by 17 US states and numerous other states are exploring options to align with or adopt the standards. In work with NJ districts, teachers have expressed interest in guidance to use disciplinary core ideas and crosscutting concepts in identifying observable natural phenomena and local community civic issues.

This workshop will include 3 sections: 1) An introduction to the three dimensions of the NGSS and summary of efforts in New Jersey to help teachers. 2) Exploration of examples of middle school curriculum aligned to the NGSS and focused on energy and matter flow through an ecosystem. In this section, participants will work through assessment design for the unit, learn how to make a zine, examine examples of student work, and learn details of how the unit supported the success of students. 3) Attendees will discuss the future prospects of extending SENCER strategies to K-12 education.

**FRIDAY,  
JULY 29**

**2:30 P.M. – 3:50 P.M.**

**WORK SESSIONS A**

### **Teaching as Scholarship**

#### **Part I: Introduction to the Scholarship of Teaching and Learning (SoTL)**

*AUD 426*

Focus: Teaching and Learning

Cynthia Maguire, [cmaguire@twu.edu](mailto:cmaguire@twu.edu)

*Texas Woman's University*

The scholarship of teaching and learning (SoTL), a project started by the Carnegie Foundation, has been described as the systematic inquiry into student learning, but what does that look like in daily practice? How does SoTL achieve the “public” dimension that is integral to any form of scholarship? What are the characteristics of scholarship focused on teaching and learning? What constitutes “evidence” in this form of scholarship? This session will provide an overview of SoTL and help participants to conceptualize their own SoTL projects

## **Designing a SENCER Course in 90 Minutes**

AUD 420

Focus: Teaching and Learning

Ellen Goldey, [egoldey@fau.edu](mailto:egoldey@fau.edu)

*Florida Atlantic University*

This is an introduction to the SENCER approach through a design exercise in which participants will develop the outline of a new SENCER-style course, including assessment strategies for the course, and opportunities for civic engagement presented by the content.

Regardless of whether the target audience is students majoring in STEM or other disciplines, SENCERizing courses will make them more relevant to students. The mission of SENCER is to develop the knowledge, skills, and dispositions of students by teaching "through" the lens of wicked problems that are often trans-disciplinary in nature. The main goal of the workshop is for to engage in the process, but don't be surprised if you develop a loveable course!

## **Civic Engagement and Professional Development: Toward a SENCERized Faculty**

AUD 430

Focus: Academic Leadership Development

Robert Seiser, [rseiser@roosevelt.edu](mailto:rseiser@roosevelt.edu)

*Roosevelt University*

Virginia McHugh-Kurtz, [vmchughkurtz@roosevelt.edu](mailto:vmchughkurtz@roosevelt.edu)

*Roosevelt University and Elgin Community College*

Owing in large part to SENCER and similar initiatives, civic engagement, active learning and other transformative pedagogies have been widely adopted by individual STEM faculty. As higher education changes, how will innovative teaching practice at the individual and course level be adopted and recognized at the department level (and beyond)? How can universities build their own self-sustaining, inclusive communities of transformation? In this session, members of the SENCER team from Roosevelt University will share their experiences as part-time and full-time faculty, both on and off the tenure track. This session will discuss the benefits of participation in the national SENCER community as a means of professional development and will suggest ways to incorporate a unique blend of scholarship, teaching and service into faculty recognition and incentive systems at the institutional level. Session participants will be able to make their own plans to expand the reach of SENCER and complement faculty development at their home institutions.

FRIDAY,  
JULY 29



## **The Impact of Cross-Sector Partnerships for STEM Learning: SENCER-Informal Science Education and Beyond**

AUD 434

Focus: Community Collaborations

Hailey Chenevert, hailey.chenevert@ncsce.net  
*National Center for Science and Civic Engagement*

Ellen Mappen, ellen.mappen@ncsce.net  
*National Center for Science and Civic Engagement*

Marsha Semmel, marsha.semmel@gmail.com  
*National Center for Science and Civic Engagement*

David Ucko, daveucko@gmail.com  
*National Center for Science and Civic Engagement*

Charles Walter, charles\_walter@baylor.edu  
*Mayborn Museum Complex, Baylor University*

NCSCE's SENCER-ISE (Science Education for New Civic Engagements and Responsibilities-Informal Science Education) initiative has supported formal and informal education cross-sector partnerships focusing on civic engagement projects such as local impacts of climate change, invasive species and habitat loss, and the public understanding of genomics. SENCER-ISE staff, SENCER-ISE advisors with national perspectives on the potential impact of such collaborations, and a former SENCER-ISE partner from the informal education sector will share insights about the benefits to both sectors that can enhance learning at all ages and in different environments. The presentations and participant discussions will highlight some basic elements of formal-informal education collaborations, offer information about national informal science networks, afford an opportunity to share cross sector partnership work being done in the SENCER community, and provide a forum to explore potential project and partnership ideas.

**4:00 P.M. – 5:20 P.M.**

**WORK SESSIONS B**

### **Coaching Change Agents: Planning, Implementing, and Sustaining Reforms**

AUD 430

Focus: Academic Leadership Development

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

Amy Shachter, aschacter@scu.edu  
*Santa Clara University*

Change happens – even in an academic setting. Change is hard – especially in an academic setting. Faculty and administrators are often motivated or called upon to lead change – to serve as change agents. Change agents struggle with ways to better plan, implement, and sustain reform on campus. This workshop will explore strategies for leading change, discuss opportunities and obstacles that change agents often encounter, and analyze case studies to assist in developing change strategies. With an interactive format, the ultimate goal of the workshop will be to coach participants in developing as change agents and in drafting strategies for change on their own campuses.

## Strategies for Departmental Transformation: Lessons from the SENCER and PULSE Projects

AUD 420

Focus: Teaching and Learning

April Hill, [ahill2@richmond.edu](mailto:ahill2@richmond.edu)

*University of Richmond*

Ellen Goldey, [egoldey@fau.edu](mailto:egoldey@fau.edu)

*Florida Atlantic University*

Alix Downing Fink, [finkad@longwood.edu](mailto:finkad@longwood.edu)

*Longwood University*

Fellows from both the SENCER community and PULSE (Partnership for Undergraduate Life Sciences Education) join forces in this participatory session to engage teams (or individuals) in strategies for developing a shared vision for department-wide improvement. Using a rubric designed by the PULSE Fellows, participants will consider ten factors known to improve learning and faculty efficacy. Participants will reflect on where their department is now, establish priorities for improvement, share best practices, and discuss ways to overcome the myriad of challenges in department-level change. Regardless of disciplinary affiliation or title, this session will be helpful in modeling engagement with faculty colleagues in discussing these issues in your home institution.

## Teaching as Research, Part II: Applying SoTL Principles to Curriculum Development

AUD 426

Focus: Teaching and Learning

Rikki Wagstrom, [rikki.wagstrom@metrostate.edu](mailto:rikki.wagstrom@metrostate.edu)

*Metro State University*

Using a case study involving mathematics curriculum integrating sustainability, this session will illustrate how SoTL can contribute to the process of developing, assessing, and disseminating curriculum. SoTL components discussed in this session include: (1) using literature searches to shape and refine research questions and to provide background context required for publication, (2) gathering evidence, (3) obtaining IRB approval, and (4) dissemination. Time will be allotted for participants to discuss SoTL projects of interest to them.

**5:30 P.M. – 7:30 P.M.**

**POSTER PRESENTATION**

*Fainman Lounge – Second Floor of the Auditorium Building*

### A NOTE ON THE SSI 2016 POSTER PRESENTATION

We are pleased to invite you to attend a special poster session that feature the work of SSI 2016 participants. Poster authors will be on hand to share their work, exchange ideas, and answer questions during the designated Poster Presentations time. You will receive a poster abstracts booklet with your registration materials that will include descriptions of each project, as well as contact information for poster authors. We hope that this booklet will facilitate meaningful exchanges during the Institute and encourage you to follow up with colleagues after the Institute.

More information, including poster abstracts, can be found in the SSI 2016 Poster Presentations Booklet. There will be refreshments served at tonight's reception.

FRIDAY,  
JULY 29

## SATURDAY, JULY 30TH

### **Notes on the Program**

*Shuttles are available to the Roosevelt campus from the Fairmont Millennium Park hotel. A schedule is included in the front of the program book.*

**7:00 A.M. – 8:30 A.M.**

**BREAKFAST**

*Dining Center*

**8:30 A.M. – 11:00 A.M.**

**ALL-INSTITUTE PLENARY SESSION III**

*Congress Lounge*

Cathy Middlecamp, presiding

**Plenary Presentation: Field Philosophy and SENCER: Multiple Knowledge Systems and Their Place in Civic Engagement**

Adam Briggie, adam.briggie@unt.edu

Associate Professor of Philosophy

*University of North Texas*

**Plenary Response: The Science of Science Communication**

Dan Kahan, dan.kahan@yale.edu

*Yale University*

**Plenary Response: Holistic Engineering**

David Ferguson, david.ferguson@stonybrook.edu

*Stony Brook University*

**11:00 A.M. – 12:00 P.M.**

**TEAM TIME**

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

**Session for Individual Representatives: Man, Monkeys and Article 15 Part 2**

*AUD 430*

Wm. David Burns, david.burns@sencer.net

*National Center for Science and Civic Engagement*

**12:00 P.M. – 1:15 P.M.**

**LUNCH**

*Dining Center*

**1:15 P.M. – 3:05 P.M.**

**SESSION BLOCK III**

**1:15 P.M. – 3:05 P.M.**

**WORKSHOPS**

SATURDAY,  
JULY 30

**Science and Technology for Social Good**

AUD 320

Focus: SENCER Across the Curriculum

David Ferguson, david.ferguson@stonybrook.edu

*Stony Brook University*

Cathy Middlecamp, chmiddle@wisc.edu

*University of Wisconsin, Madison*

Komal Magsi, komal.magsi@stonybrook.edu

*Stony Brook University*

Many of the pressing 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 disciplines, to have the inclination and abilities to address these and other areas. This session will focus on approaches (Including SENCER) that transcend discipline-specific knowledge to engage students in holistic ways of understanding, planning projects, and applying their knowledge. Presenters will focus on efforts in several content areas: sustainability, technological design, and engineering. All of these curricular efforts have the aim of helping students to take advantage of and build on their diverse experiences, cultures and knowledge. Courses and programs enable students to engage in knowledge production and to make contributions to comprehensive team efforts focused on projects aimed at a social good – locally, nationally, or globally. Session participants, working in groups, will share their existing work in linking STEM and social good and will explore ideas for new courses that might be offered at their institutions.

**SENCER Across the Curriculum: Integrating STEM, Humanities, and the Arts**

AUD 420

Focus: SENCER Across the Curriculum

Jay Labov, jlabov@nas.edu

*National Academies of Sciences, Engineering, and Medicine*

Eliza Reilly, eliza.reilly@ncsce.net

*National Center for Science and Civic Engagement*

Susan Scheckel, susan.scheckel@stonybrook.edu

*Stony Brook University*

The session will provide an overview of the growing trend, and the educational rationale behind the trend, to integrate humanities and art content into STEM courses and programs, at both the undergraduate and graduate levels. SENCER courses, due to their deliberate linking of STEM content to civic questions, have always incorporated content traditionally associated with the social sciences (public policy, economics, sociology, etc.). More recently there has been a recognition of the potential learning gains that might result from creating integrative curricula that explore the indissoluble connections between the problems and challenges associated with science and technology and those addressed by the arts and humanities disciplines.

Using examples from SENCER faculty, presenters will suggest ways that integrating STEM, the humanities, and the arts could transform both the undergraduate and graduate curriculum, and the role that SENCER strategies could play in that transformation. A description of a new study by the National Academies of Sciences, Engineering, and Medicine to examine the evidence base for the impacts of integrating the STEM disciplines and humanities also will be discussed.

### **Curiosity, Cultural Pluralism, and the Science of Science Filmmaking**

*AUD 528*

Andrea Aust, [aaust@kqed.org](mailto:aaust@kqed.org)  
*KQED*

Dan Kahan, [dan.kahan@yale.edu](mailto:dan.kahan@yale.edu)  
*Yale University*

Katie Carpenter, [katie.carpenter@yale.edu](mailto:katie.carpenter@yale.edu)  
*Everwild Media*

This presentation will report on an ongoing project to carry the philosophy of SENCER to a new domain: science filmmaking. Working in collaboration with a group of professional science filmmakers, researchers from the Cultural Cognition Lab and the Annenberg Public Policy Center have conducted a set of studies on engagement with science documentaries. The studies have furnished compelling corroboration that science curiosity is a real disposition, that it is distributed widely across the population, and that it can enable diverse citizens to take pleasure in contemplation of scientific insight even on societally contested issues. Moreover, because both science curiosity and the success of skilled professionals in satisfying it admit of empirical *measurement*, scientific knowledge has a role to play here, as elsewhere, in maximizing its own propagation.

The workshop's aims are to impart understanding of the process by which empirical methods are being used in this collaboration and to solicit feedback on how the process can be improved and extended.

**1:15 P.M. - 2:05 P.M.**

**CONCURRENT SESSIONS A**

### **Polygons and Platonic Solids—A Hands-on Approach**

*AUD 306*

**Focus: Applying SENCER to K-12 Education Challenges**

Caroll Wells, [carroll.wells@lipscomb.edu](mailto:carroll.wells@lipscomb.edu)  
*Lipscomb University*

In this session, a paper folding activity will be used to create polygons and to study associated geometric properties and measurements. The activity concludes with the creation of two of the Platonic solids, a tetrahedron and an icosahedron. Selections from over eighty geometry concepts will be reviewed and discussed during the session. This session will demonstrate how these geometric concepts can be applied in grades K-university with details added as the grade level increases. Participants will consider why a biologist studies the icosahedron and how mathematics teachers can use the activity for a history and writing assignment. Printed instructions will be provided.

**SATURDAY,  
JULY 30**

**Addressing Barriers that Prevent Science Fair Participation for Elementary School Students**

AUD 426

Focus: Applying SENCER to K-12 Education Challenges

Catherine Haslag, catherine.haslag@riverland.edu

*Riverland Community College*

Founded in 2014, the Science Fair Mentoring Project is designed to address barriers elementary school students experience when participating in the science fair. This program pairs students with mentors who guide them through the process of selecting, researching, and completing projects for the science fair. By engaging community and college members, elementary school students are able to build positive relationships with adults and explore science in a new way. The design, goals, outcomes, and future directions of this program will be discussed with an opportunity for attendees to ask questions about this program.

**SENCERizing Your Department: A Workshop for Departmental Leaders**

AUD 430

Focus: Academic Leadership Development

Steve Cohen, scohen@roosevelt.edu

Melanie Pivarski, mpivarski@roosevelt.edu

*Roosevelt University*

In this session, participants will consider and assess the resources in their own institution and how to leverage them to bring about departmental change. Examples from the Roosevelt Math department will be offered, along with information on programs and resources developed for mathematics departments. Participants are encouraged to bring information on other resources to share. The main focus will be on chairs and other departmental leaders, although all are welcome.

**2:15 P.M. - 3:05 P.M.****CONCURRENT SESSIONS B****What is “Active Learning?”**

AUD 306

Focus: Teaching and Learning, Applying SENCER to K-12 Education Challenges

Drew Sieg, drew.sieg@gmail.com

*Young Harris College*

Active learning engages students in their learning by encouraging thoughtful reflections, the practice of new skills, and the application of new knowledge. Active learning includes any activity that students do before, during, or after class that moves them beyond passive listening and note taking – to explore the new materials, to consider what they have read, seen and heard, apply it to real life situation or new problems, and proactive the process of adapting and applying learning while alone, in pairs, or in groups. Decades of research in multiple disciplines, several models of instruction, and emerging best practices in assessing student learning are available for support the faculty member who believe students will learn better when classroom activity is not limited to lecturing alone. This session will provide an overview of effective practices in active learning. Participants, working in small groups, will consider benefits and drawbacks to active learning, share their own efforts to incorporate active learning strategies, explore “Process Oriented Guided Inquiry Learning” (POGIL) strategies, and examine active learning strategies for lab settings.

## **Dual Enrollment: Strengthening College/High School Connections**

AUD 426

Focus: Applying SENCER to K-12 Education Challenges

Missy Holzer, mholzer@monmouth.com

*Monmouth University*

There is a growing movement to help students know their options regarding STEM careers and achieve early college success through dual credit/dual enrollment courses. These courses partner secondary schools with colleges and universities to offer rigorous and enticing courses not typically offered in a high school, while providing students with college credit. Such programs can strengthen high school and college connections while maintaining quality control over course content. This interactive session reviews the goals and challenges associated with dual credit programs, and presents multiple models that have been successfully implemented across the United States. Attendees will have the opportunity to brainstorm potential models and strategies for their local institutions.

## **Sustainability: Structure and Strategy for “Non-Glacial” Academic Change**

AUD 430

Focus: Community Collaborations

Bob Franco, bfranco@hawaii.edu

Krista Hiser, hiser@hawaii.edu

Michael Ross, mikeross@hawaii.edu

*Kapi'olani Community College*

Can higher education respond faster than the glaciers melt?

The ten campus University of Hawaii (UH) System has developed an Executive Sustainability Policy. In response Kapi'olani Community College's has developed an aligned Strategic Plan for 2016-2021 and Campus Sustainability Plan for 2016-2019. The Sustainability Plan includes: 1) Native Hawaiian Wisdom; 2) Curriculum, Teaching, and Learning; 3) Community Engagement; and 4) Facilities matters including reducing energy, water, waste and increasing use of local foods for food security. In this session Dr. Krista Hiser, who is leading the UH System sustainability curriculum, will discuss teaching, and learning innovations; Michael Ross will discuss his integration of service-learning and undergraduate research with Hawaiian flora, and invasive species issues in Hawai'i. Specific campus initiatives will be highlighted including: Service and Sustainability Learning; NSF STEM grant support for environmental science and engineering (reengineering islands), Malama in na Ahupua'a through the MINA Program at UH Manoa, AASHE S-designated courses, Engineers for A Sustainable World, Ecology Club, and the Sustainability Promotion Team.

**SATURDAY,  
JULY 30**

**3:30 P.M. - 5:20 P.M.**

**SESSION BLOCK IV**

**3:30 P.M. - 5:20 P.M.**

**WORKSHOPS**

**Moving Your Academic Career Forward – The Next Step**

*AUD 320*

Focus: Academic Leadership Development

Karen Kashmanian Oates, koates@wpi.edu

*Worcester Polytechnic Institute*

So Dr. X has been at Institution Y for several years and is wondering what the next phase in his or her 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. This session will explore options for mid-career academics and the steps that can get them on track for their next position. As a group the participants will dissect two case studies, engage in a dialog, and position themselves (or others) to be competitive for the next steps in advancing their academic career goals. The session will conclude with the creation of a personalized strategic career development plan.

**Creating the Student-Centered Classroom**

*AUD 306*

Focus: Teaching and Learning

Drew Sieg, drew.sieg@gmail.com

*Young Harris College*

This workshop will discuss the many considerations that go into designing a student-centered classroom. It will begin with an evaluation of how students are currently engaged in your courses, followed by a discussion of common challenges associated with implementing active pedagogies. After sharing novel formative and summative assessments that have been successful in learner-centered classrooms, it will conclude by implementing backwards design to restructure a lecture-intensive class into a cooperative learning environment. This session will also touch on the concepts of Bloom's taxonomy, constructivism, problem-based learning, authentic research experiences, flipped classrooms, and process oriented guided inquiry learning (POGIL).

**3:30 P.M. - 4:20 P.M.**

**CONCURRENT SESSIONS A**

**The Challenge of Graduate Education in the “New Academy”**

*AUD 430*

Focus: Academic Leadership Development

Robert Seiser, rseiser@roosevelt.edu

*Roosevelt University*

This session will provide an open forum for exploring and discussing the challenges and opportunities of graduate education, both in STEM fields and more generally, in a rapidly changing job market. Topics will include proposed changes to federally sponsored graduate training programs, student goals for civic engagement and career development, and the potential of SENCER/NCSCE to enhance education at the masters and doctoral levels.

**SATURDAY,  
JULY 30**



## **Of Rice and Men: Food Science and Literature for the Gen Ed Soul**

AUD 420

Focus: SENCER Across the Curriculum

Autumn Marshall, autumn.marshall@lipscomb.edu

Lipscomb University

The general education program at Lipscomb University requires students to take a minimum of two integrated courses at the sophomore level. There are four categories: Integrated History, Integrated Literature, Integrated Math and Science, and Integrated Social Science. These offerings have included courses that blend STEM disciplines for years, but are now integrating STEM disciplines with humanities disciplines. In Spring 2016, Lipscomb offered a cross-listed integrated literature and integrated math/science course entitled, *Food and Literature: Of Rice and Men*. The course examined food in literature, as well as discussed the science behind the foods commonly cooked and eaten. This blending allowed students to choose either the literature or math/science option, as the course was listed on the schedule twice but offered in the same room at the same time with both teachers present.

Food has provided an excellent framework for both rich class discussions and scientific explanations of the chemistry and physics of cooking in the foods lab (alongside delicious lab results!) The course has been evaluated in a number of ways, including the SENCER-SALG, essay questions, reading quizzes, and lab reports; all of which provided evidence of student gains in both content knowledge and attitudes. Students reported appreciating the variety of included in the course, which included canonical literature but also social media posts, video documentaries, and advertisements. Additionally, students have responded well to the opportunity to learn science concepts through edible laboratory assignments. The session will also demonstrate how results from the SENCER-SALG can be used to make adjustments in the course as it is offered in the future.

## **Radioactivity, People, and Our Planet (Is it Time?)**

AUD 528

Focus: Teaching and Learning

Cathy Middlecamp, chmiddle@wisc.edu

University of Wisconsin-Madison

“Nuclear Unclear” was the title of a SENCER plenary address at SSI 2011. In it Cathy Middlecamp told stories of radioactivity, people, and our planet. What has changed since then? Are issues relating to nuclear energy, nuclear medicine, and nuclear weapons finding their way into SENCER courses? This session invites those who are concerned or interested in teaching about nuclear issues, or are just curious about how they can use this topic in their courses. This interactive session will utilize one of the 2016 SENCER Pearls of Practice, “What’s radioactive in this room?” in order to start a conversation that could easily launch a SENCER course on nuclear power, medicine, weapons or even about uranium and other radioactive substances on our planet.

SATURDAY,  
JULY 30

4:30 P.M. - 5:20 P.M.

CONCURRENT SESSIONS B

**Building Collaborative Networks Integrating Natural, Social, and Indigenous Knowledge – SENCER Hawaii in Formal and Informal Networks**

AUD 528

Focus: Community Collaborations

Ulla Hasager, ulla@hawaii.edu

*University of Hawaii at Manoa*

The presentation will begin by presenting a SENCER Hawaii film intended for a national audience, as a central part of a multi-media campaign. While it depicts Hawai'i's existing multi-institutional and statewide collaborative initiatives, its community engagement programs, and SENCERized classroom instruction integrating indigenous, social, and natural sciences in education, the film also provides information about the SENCER state concept and network development. Intended to inspire other SENCER institutions across the nation to develop collaborative/state networks, the film was produced to garner support from key stakeholders, policy makers, and funders; reach out to faculty at community colleges, private universities, and to informal science educators throughout Hawai'i; expand and strengthen existing collaborations and multi-institutional team development activities as well as help create SENCERized curricula and civic engagement opportunities at additional institutions. The film showing will be followed by additional information, discussion, and a chance for the participants to become engaged in working on collaborative network.

**SENCER in Online Courses**

AUD 430

Focus: Teaching and Learning

Dennis Lehman, dennisleh@msn.com

*Harold Washington College*

This session invites faculty who have taught on-line courses, or are interested in teaching on-line, to share ideas and insights about how to incorporate civic engagement into distance learning. Some topics to be discussed include incorporating letters to policy makers and legislators into assignments, partnering with local and national government agencies or NGO's, and collaborating with Informal science educators, such as zoos, museums, and parks.

SATURDAY,  
JULY 30

**SENCER and Team-Taught Courses**

AUD 420

Focus: Teaching and Learning

Autumn Marshall, autumn.marshall@lipscomb.edu

*Lipscomb University*

Cynthia Maguire, cmaguire@twu.edu

*Texas Woman's University*

Through the years, many SENCER courses have been offered as team-taught courses, either to the delight or the chagrin of both students and educators. What makes a team-taught course work? This session will discuss best practices for team-taught courses as described in scientific and educational literature, a variety of ways in which courses may be taught by more than one professor, lessons learned in the field, and pitfalls to avoid. Additionally, assessment of team-taught courses will be discussed.

**5:30 P.M. – 7:00 P.M.**

**DINNER RECOGNIZING ACHIEVEMENTS IN THE NCSCE COMMUNITY**

*Murray-Green Library*

Monica Devanas, presiding

We invite all SSI 2016 participants to join us for dinner to celebrate your work over the past year and during the Institute. 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. This session will also recognize new and returning SENCER model developers, and provide an update about new NCSCE programs. The program will culminate with the presentation of the William E. Bennett Award for Extraordinary Contributions to Citizen Science and remarks from NCSCE Executive Director Wm. David Burns.

**SATURDAY,  
JULY 30**

## SUNDAY, JULY 31ST

### **Notes on the Program**

*All sessions will be held at Roosevelt University*

*Shuttles are available to the Roosevelt campus from the Fairmont Millennium Park hotel. A schedule is included in the front of the program book.*

**7:00 A.M. – 8:30 A.M.**

**BREAKFAST**

*Dining Center*

**8:30 A.M. – 11:00 A.M.**

**ALL-INSTITUTE PLENARY SESSION IV**

*Congress Lounge*

Danielle Kraus Tarka, presiding

#### **Plenary Presentation: Transforming the Classroom to Truly Embrace Diversity**

Cindy Kaus, cindy.kaus@metrostate.edu

Associate Professor of Mathematics

*Metropolitan State University*

#### **Plenary Response:**

Monica Devanas, devanas@ctaar.rutgers.edu

Director of Faculty Development and Assessment Programs, Center for the Advancement of Teaching

*Rutgers University*

**11:00 A.M. – 12:15 P.M.**

**BRUNCH**

*Dining Center*

**12:30 P.M. – 2:30 P.M.**

**SESSION BLOCK V**

**12:30 P.M. – 1:20 P.M.**

**CONCURRENT SESSIONS A**

#### **Implementation of Civic Engagement in Biology Courses: Assessment Strategies and Outcomes**

*AUD 320*

Focus: Teaching and Learning

Anna Rozenboym, anna.rozenboym@kingsborough.edu

*Kingsborough Community College*

The session will provide a brief overview of a curricular design grounded in SENCER ideals, emphasizing implementation of a civic engagement component in Anatomy and Physiology courses. Construction of SALG assessment tools customized for the course will be reviewed and participants will be offered an opportunity to construct questions relevant to their discipline and course content, explore various teaching and learning practices, the perceptions and attitudes of students, as well as their mastery of the content. Strategies for survey administration, including planning and recruitment, choice of assessment tools, timing of surveys, and students' response rate will be addressed. Assessment strategies, including analysis of both qualitative and quantitative data sets will be presented. The results obtained by SALG pre- and post-surveys will be included in the presentation. Through an interactive discussion, the meaning of assessment results as well as their value to both students and faculty will be elucidated.

**SUNDAY,  
JULY 31**

## **Dean's Forum**

AUD 420

Focus: Academic Leadership Development

Karen Kashmanian Oates, [koates@wpi.edu](mailto:koates@wpi.edu)

*Worcester Polytechnic Institute*

This session will provide an occasion for academic administrators to reflect on their critical role in advancing and supporting innovation and reforms, including SENCER, in their home institutions, and how they can create an academic culture that fosters faculty leadership, cooperation, and creativity. Participants will be invited to share experiences, successes, and challenges, and to consider the opportunities and resources that SENCER's national "community of transformation" could offer deans and other academic leaders as they navigate the terrain of the changing higher education landscape.

## **Transformative Sustainability: STARS, SENCER, and the Future of the University**

AUD 528

Focus: Community Collaborations

Mike Bryson, [mbryson@roosevelt.edu](mailto:mbryson@roosevelt.edu)

Maria Cancilla, [mcancilla@mail.roosevelt.edu](mailto:mcancilla@mail.roosevelt.edu)

Rebecca Quesnell, [rquesnell@roosevelt.edu](mailto:rquesnell@roosevelt.edu)

*Roosevelt University*

During the time that SENCER has inspired civic engagement and pedagogical innovation in STEM undergraduate education, colleges and universities have been engaged in a sustainability revolution. This session describes Roosevelt University's journey since 2010 to "green" its curriculum, buildings, operations, and community relations — efforts which culminated in the development of a Strategic Sustainability Plan and Roosevelt's first STARS rating in 2015 from AASHE. In line with SENCER's approach of students learning through applied, real world contexts, RU's sustainability work has been student-driven from the outset. In this presentation, Roosevelt students, staff, and faculty will discuss how the academic and operational wings of a university can collaborate on campus sustainability initiatives across a broad range of topics. The presenters will demonstrate how aligning the goals and methods of SENCER with campus sustainability endeavors has transformative potential for students, faculty, and other institutional stakeholders.

**SUNDAY,  
JULY 31**

## Controversial Public Policy Questions in an Election Year

AUD 628

Focus: Teaching and Learning

Frank Wattenberg, frank.wattenberg@mac.com

*United States Military Academy*

Wm. David Burns, david.burns@sencer.net

*National Center for Science and Civic Engagement*

Assuming both conventions go as expected, this year's election will be extremely important and extremely contentious. Scientists and as educators have an enormous opportunity, an enormous responsibility, and face enormous problems. Many of the issues in this election involve not only science but also the role of science in public policy. Scientists can help inform the debate and also explain the role of science and scientists. Although a great deal has been written about the role of news people and, in particular, the false impression created by giving equal time to both sides, less has been written about the role of educators. Educators must respect students with different opinions while being honest about their own beliefs, an obligation, complicated by the fact that they assign grades. This session will be an open discussion about ways in which these kinds of questions and discussions can be handled in classrooms. Part of this discussion will examine a simple and intuitive but instructive mathematical model that might help understand the importance of civil discourse in avoiding the extreme polarization that has captured American society.

**12:30 P.M. - 12:50 P.M.**

**PRESENTATIONS A**

## Science Education and Civic Engagement: An International Journal

AUD 426

Focus: Academic Leadership Development

Eliza Reilly, eliza.reilly@ncsce.net

*National Center for Science and Civic Engagement*

This session is an introduction to the National Center's peer-reviewed e-journal *Science Education and Civic Engagement: An International Journal*. The session will cover the journal's mission, content areas, and editorial process and will welcome questions and proposals for submissions from prospective contributors. If you are interested in disseminating your work on SENCER or other science education projects with civic components, please attend! This session will also serve as a continuation of the Institute's exploration of the Scholarship of Teaching and Learning

## Peer Enhanced Experiential Research in STEM

Kenneth Nicholson, k-nicholson@neiu.edu

Sudha Srinivas, s-srinivas@neiu.edu

Northeastern Illinois University

Northeastern Illinois University (NEIU) recently received a National Science Foundation Improving Undergraduate STEM Education (NSF-IUSE) grant to enhance the academic engagement and learning experience of its undergraduate STEM majors. The PEERS project is a cross-cutting, curricular initiative that embeds "research" modules into entry-level courses in Chemistry, Earth Science, Physics, Mathematics and Computer Science, using a "scale up, scale down" strategy of engaging a larger group of students in laboratory-based guided research activities within a classroom setting through mini research projects incorporated across the curricula.

SUNDAY,  
JULY 31

Students drawn from an intermediate or upper level cohort serve as peer leaders for the introductory courses, and are trained through a newly designed, multi-disciplinary research workshop course. This presentation will describe specific examples of open ended, inquiry based interdisciplinary research projects in the fields of statistics, computer science, chemistry, and physics that are being integrated into the curriculum. Connections to civic engagement and responsibility will be highlighted. Data on student assessment of learning gains as well as student attitudes before and after the research experiences will be presented. The challenges of persistence and graduation in STEM are not unique to NEIU and the results of the project are relevant to other urban institutions with a large percentage of students with financial, familial, as well as other challenges which often delay or impede graduation.

### **STEAM Cleaned: Fostering Collaborations Between STEM and Humanities Through the Topic of Clothing**

AUD 430

Focus: SENCER Across the Curriculum

Rita Kranidis, [rita.kranidis@montgomerycollege.edu](mailto:rita.kranidis@montgomerycollege.edu)

Montgomery College

For the last two years, the Global Humanities Institute has worked with instructional designers at Montgomery College to create events that bring together faculty in STEM and the Humanities to address a global concern. Outstanding faculty representing several disciplines prepared for the workshop by discussing how disciplinary collaborations might enhance the way they teach topics like the ones featured at each event: In 2015, the topic was "STEAMed Rice: Collaborations Between STEM and the Humanities on the Topic of Global Food." In 2016, the topic was "STEAM Cleaned: Collaborations Between STEM and the Humanities on the Garment Industry." Faculty also prepared and shared resources that would support their interdisciplinary teaching.

In this session the Director of the Global Humanities Institute will share some of the discoveries of the STEAM workshop faculty participants, including teaching resources, insights on the possibilities for integrating STEM and the Humanities to address global issues, and their ideas for how their new learning might manifest itself in the various classrooms in the near future. Information about the STEAM workshops' partnership with the Pulitzer Center in Washington DC, which has stepped forward to support this curricular innovation work, will also be provided.

**1:00 P.M. - 1:20 P.M.**

**PRESENTATIONS B**

### **Pop-Up (Mobile) Chem Lab**

AUD 426

Focus: Teaching and Learning, Community Collaboration

Shelby Hatch, [slhatch@u.northwestern.edu](mailto:slhatch@u.northwestern.edu)

Northwestern University

During the final course in each of the general chemistry laboratory sequences at Northwestern University, students actively engage in experiments that have application far beyond the traditional laboratory. Each group of four students develops a hands-on "informal science" activity related to a specific general chemistry topic, implementing their activity with the public and presenting their results in a poster session at the end of the quarter. The overall project requires students to identify their audience and to design an appropriate activity that can be completed in about twenty minutes. Additionally, students are required to determine how to assess their project in terms of content, as well as the engagement and interest of their participants. Audiences have ranged from pre-school children to non-STEM Northwestern University students. Participants are either invited into the general chemistry laboratory to perform the activity, or the students travel to them with a mobile "laboratory" that is a modified tricycle food cart. Inaugural year feedback suggests strong learning gains—both anticipated and not—for both the general chemistry students and their audiences. Learning outcomes and future directions will be discussed.

**SUNDAY,  
JULY 31**

## **How STEM Became STEAM and Everyone Won: Incorporating Humanities in STEM Disciplines**

AUD 430

Focus: SENCER Across the Curriculum

Gillian Backus, gbackus@nvcc.edu

*Northern Virginia Community College*

Nationally, STEM education is in the spotlight as a pathway to improving economic and technological capacity. At the same time, traditional STEM education misses opportunities to integrate with humanities and art disciplines in ways that strengthen learning outcomes. Many global problems, such as population growth, inadequate health care, resource sustainability, and poor water quality require multiple perspectives and the expertise of many disciplines, from science and economics to geography, history, and politics. Tomorrow's leaders need abstract and critical thinking skills to successfully navigate critical issues, and develop unique approaches to solving these global problems. Such cross-disciplinary courses that bridge the STEM and humanities disciplines are rare.

This presentation will provide two examples of non-traditional, inter- and trans-disciplinary curriculum development from a community college, provide quantitative assessment of the results, and encourage a wider discussion on ways that integrating the arts into STEM learning can improve undergraduate outcomes.

**1:30 P.M. - 2:20 P.M.**

**CONCURRENT SESSIONS B**

## **Differentiating Instruction for All Learners in the STEM Classroom**

AUD 320

Focus: Teaching and Learning

Karen Dunlap, kdunlap@twu.edu

Rebecca Fredrickson, rfredrickson@twu.edu

*Texas Woman's University*

In this interactive session, participants will engage in a number of differentiated instructional activities focused specifically on meeting the needs of a diverse student population in a STEM classroom. There will also be a handout explaining different ways to use these activities in multiple settings. The three activities are:

- 1) Science Synetics - This is for the visual learner. Working in groups, participants will be given a picture (a shore with a lighthouse, for example) and invited to define ways that the picture represents what is being studied at the moment. This exercise can be used in multiple ways for formative assessment to enable faculty to examine critical thinking in students.
- 2) Mock Debate – In a much abbreviated version of the activity that would be carried out in the classroom, two groups of participants will assume positions (pro/con) and will have 10 minutes to put notes together for the topic, "Should human cloning be legal in the US?" After the ten minutes, a random person will be selected from each group to participate in a structured debate on the topic.
- 3) Rap/Song creation – Designed kinesthetic learner, in this exercise participants will create a song or a rap (with movement) to the planets. Applicable for multiple topics across the STEM curriculum, this exercise can serve as a summative assessment measure or simply as a learning tool for students.

**SUNDAY,  
JULY 31**



**Assessing for Student Success: Getting Started with the SENCER-SALG**

AUD 628

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 effectively. Working directly with the SENCER-SALG website, participants will learn how to set up survey instruments for their own classes, administer the surveys, and interpret the results. Participants will also learn how to customize the instrument to include both their own course goals and SENCER's programmatic goals. This session is especially geared for those new to the SENCER-SALG.

*Note: if your team or group is not familiar with the SALG, we suggest one member attend one of the two SALG sessions. Use of the SALG is required on Post-Institute Implementation Award applications that involve courses or academic programs.*

**Designing Open-Inquiry Laboratories for K-12 Students: It Needn't be Chaotic**

AUD 420

Focus: Applying SENCER to K-12 Education Challenges

Linden Higgins, linden.higgins@uvm.edu

University of Vermont

The Next Generation Science Standards (NGSS) require K-12 teachers and informal educators to engage young learners with authentic scientific and engineering practices. Research evaluating implementation of NGSS reveals that designing and facilitating open student inquiry in the regular classroom is very intimidating for many teachers. Key to reducing the sense of unease around authentic practice is to provide opportunities for open-inquiry laboratory exercises for education majors and other non-science students.

SENCER ideals provide a guide to creating laboratory opportunities: these labs must allow students to exercise their growing knowledge and skills in science to address issues of personal interest, with no single "right" answer. However, many faculty and departments avoid student-driven open-ended laboratory activities in introductory courses for fear of chaos or added expenses. After discussing the eight components of NGSS scientific and engineering practices and their alignment with SENCER ideals, this session will propose an approach to laboratory design that allows open-inquiry without greatly increasing expense or chaos. Most of the session will be spent developing model laboratory exercises for participants' classes.

## **Full Circle: Creating Learning Opportunities Through Constructive Feedback**

AUD 528

Focus: Teaching and Learning

Mangala Kothari, mkothari@lagcc.cuny.edu

Marina Nechayeva, mnechayeva@lagcc.cuny.edu

*LaGuardia Community College*

As part of the Engaging Math SENCER Project at LaGuardia Community College, several learning modules have been created for the Elementary Statistics Course. The 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.

With the goal of fostering quantitative reasoning skills through assignments that increase students' awareness and connect their learning to the real world, each module reveals the relevance and applicability of statistics to the understanding of a social, environmental or civic issue, and provides a meaningful context for data analysis and statistical inference.

One of the main challenges presented by such assignments is to allow students a degree of freedom, while ensuring they grasp key principles and ideas. Very often students struggle the most with questions that call upon their logical and critical thinking skills and many fail to reach conclusions their research points towards.

Participants will use examples from Engaging Math – related statistics classes to explore the following questions: How do we assess students' written responses to this kind of open-ended questions so as to create learning opportunities? What kind of constructive feedback would best serve the purpose of encouraging independent thinking while helping students realize their judgment may be clouded by pre-conceptions and/or suffering from logical fallacies and inconsistencies?

**1:30 P.M. - 1:50 P.M.**

**PRESENTATIONS C**

## **Science Literacy for the 21st Century: An Institutional Initiative to Foster Science-Informed Decision-Making about Food, Energy, and Water**

AUD 434

Focus: Teaching and Learning

Cory Forbes, cory.forbes@unl.edu

*University of Nebraska-Lincoln*

A growing human population necessitates a substantial increase in global food production while managing increased costs and decreasing natural resources, a situation that demands technological innovation, human ingenuity, and leadership. To confront these challenges, tomorrow's global citizens must learn to employ scientific knowledge in the context of social, cultural, legal, and economic realities. This session will describe the Science Literacy Initiative, a comprehensive, collaborative, and far-reaching effort of the University of Nebraska-Lincoln's Institute of Agriculture and Natural Resources. Its objective is to foster a scientifically literate society capable of making effective decisions grounded in STEM-informed analyses of complex, multi-faceted, real-world challenges, particularly those associated with the agriculture and natural resource challenges of food, energy, and water systems. The project addresses diverse audiences, including PK-12 teachers and students, undergraduate and graduate students, stakeholders, and the public through innovative teaching, extension, outreach, and research activities that leverage multidisciplinary expertise across the College of Agricultural Sciences and Natural Resources, Nebraska Extension, and the College of Education and Human Sciences.

**SUNDAY,  
JULY 31**

## **The Science Behind Digital Design**

AUD 326

Susan Reiser, reiser@unca.edu

UNC Asheville

The human vision system impacts digital design choices. Why is it that some color combinations are hard to read? Why are certain typefaces easier to read online than others? Which graphics format is best for line drawings? The answers to these questions are tied to the physiology of our eyes. In this presentation, participants will learn how to select an appropriate image format, e.g. jpg, png, gif, svg; the right typeface; and a good color combination as well as the physiology behind those design decisions.

## **The Benefits of Teaching a Project Based Learning (PBL) Organismal Biology Course at a Community College**

AUD 330

Focus: Teaching and Learning

Barbara Berchiolli, bberchiolli@gmail.com

Harold Washington College

The decision to convert an existing introductory organismal biology course into a Project Based Learning (PBL) course has two objectives. The first is to promote student environmental awareness and respect for natural resources. To this end, phytoremediation (the treatment of environmental problems (bioremediation) through the use of plants) presents itself as a useful environmental issue that engages students and lends itself to a lab curriculum for a PBL course. A second goal is to provide an opportunity to compare learning gains between an existing traditional introductory organismal biology and a newly designed PBL course. This session will explore the hypothesis that PBL strategies, which foster critical thinking, should produce learning gains in comparison with traditional lab-based courses.

**2:00 P.M. – 2:20 P.M.**

**PRESENTATIONS D**

## **A Collaboration Between a 2-year College and a 4-year Institution on an Introductory Biochemistry Laboratory Course Based on Project Based Learning**

AUD 434

Focus: Teaching and Learning, Community Collaboration

Farah Movahedzadeh, fmovahedzadeh@ccc.edu

Harold Washington College

Students are often required to take laboratory courses as a part of meeting general education requirements. The standard experiments in these settings are often non-sequential and non-engaging. This often results in unengaged students in the labs who merely move through the steps to complete the assignment, where results are often predictable. Providing a series of connected experiments, in a form of Project Based Learning, that guide the students to a final conclusion, can lead to greater engagement and understanding of the laboratory process and scientific method applied to an authentic problem. This broader knowledge of the scientific method will ultimately give students a real world experience with research in a classroom setting, and optimally, encouraging them to consider pursuing more STEM education.

Harold Washington College (HWC) in collaboration with the Institute of Tuberculosis Research at the University of Illinois at Chicago (UIC) is proposing a unique opportunity to engage students' interest in STEM fields through a Problem Based Learning opportunity working with protein from its expression to preparatory crystallography.

## **A Math Learning Environment that Nourishes General Education**

AUD 326

Focus: Teaching and Learning

Herb Schanker, [Herbert.Schanker@csi.cuny.edu](mailto:Herbert.Schanker@csi.cuny.edu)

*College of Staten Island*

To prepare their students to become useful citizens in this complex and rapidly changing environment, The Computer Science Department at the College of Staten Island (CSI) offers a comprehensive general education course in technology.

Normally technology education depends very strongly on quantitative and mathematical reasoning. Unfortunately non-STEM students are often math-averse, so math was de-emphasized in the general education curriculum. As time progressed, and through the influence of SENCER, quantitative and mathematical reasoning education became a more significant component of general education.

The session will explore the type of technology-oriented math currently being taught, along with examples of successful student experiences. Pedagogical practices, such as increased hands on class work (less lecturing), repetition of concepts throughout the academic term, and applications of math to everyday life will be discussed. Participants will be encouraged to describe their own experiences of integrating math into general education curriculum.

## **GEARing UP with SENCER in K-12**

AUD 330

Focus: Applying SENCER to K-12 Education Challenges

Andrea Martinez, [amartine@unca.edu](mailto:amartine@unca.edu)

Susan Reiser, [reiser@unca.edu](mailto:reiser@unca.edu)

Tiece Ruffin, [truffin@unca.edu](mailto:truffin@unca.edu)

*UNC Asheville*

Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) is a federally funded initiative to provide a pathway to college for middle school and high school students. Within GEAR UP, UNC Asheville focuses on middle school students in eleven western North Carolina counties. Presenters will discuss their efforts to provide K-12 faculty-driven SENCER professional development that also serves to advance the goals of GEAR UP.

**SUNDAY,  
JULY 31**

## 2:30 P.M.

## AFTERNOON ACTIVITIES

Following the day's sessions, participants are free to enjoy an afternoon in Chicago. The following are several activities that you may enjoy on your own. We also suggest using this afternoon as additional team time or for visiting the institutions of informal learning on this list to see how they can be of better use in your SENCER work. Some options, with descriptions taken from their websites, are:

**1) Art Institute of Chicago** - The Art Institute of Chicago collects, preserves, and interprets works of art of the highest quality, representing the world's diverse artistic traditions, for the inspiration and education of the public and in accordance with the profession's highest ethical standards and practices.

The Art Institute is located within walking distance of the Fairmont hotel, just south of Millennium Park, on Michigan Avenue.

**2) The Field Museum of Natural History** - The Field Museum inspires curiosity about life on Earth while exploring how the world came to be and how we can make it a better place. Visitors, students, educators and scientists from around the world are invited on a journey of scientific discovery.

The Field Museum is located within walking distance of the Fairmont hotel, just south of Millennium Park, on Lakeshore Drive.

**3) Shedd Aquarium** - The John G. Shedd Aquarium is known as "The World's Aquarium." Situated on Chicago's lakefront, Shedd is home to 32,000 animals representing more than 1,500 species of fishes, reptiles, amphibians, invertebrates, birds and mammals from waters around the world.

The Shedd Aquarium is located within walking distance of the Fairmont hotel, just south of Millennium Park, on Lakeshore Drive.

**4) Chicago Architecture Foundation River Cruise** - Chicago Architecture Foundation docents interpret more than 50 buildings along the Chicago River. You'll find out how Chicago grew from a small settlement into one of the world's largest cities in less than 100 years. In 90 minutes, get the real story on Chicago architecture and its history.

The River Cruise is based at the southeast corner of the Michigan Avenue Bridge at Wacker Dr., about 3 blocks north of the Fairmont hotel.

**5) Willis Tower Skydeck** - The Skydeck is located inside the Willis Tower, the tallest building in the Western Hemisphere. A recently added glass box allows visitors to go approximately 4 feet past the edge of the building.

The Willis Tower is located at 233 S Wacker Dr., approximately 8 blocks from Roosevelt University.

## MONDAY, AUGUST 1ST

### **Notes on the Program**

*All sessions will be held at Roosevelt University*

*Shuttles are available to the Roosevelt campus from the Fairmont Millennium Park hotel. A schedule is included in the front of the program book.*

**7:00 A.M. – 8:00 A.M.**                      **BREAKFAST**  
*Dining Center*

**8:00 A.M. – 9:50 A.M.**                      **SESSION BLOCK VI**

**8:00 A.M. - 9:50 A.M.**                      **WORKSHOP**

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

*AUD 320*

Focus: Academic Leadership Development

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

Are you redesigning a course to include SENCER elements? Are you designing a new SENCER course? Are you able to demonstrate that your new course improves student learning? Did you know the SENCER Models are formatted as Course Portfolios? If you answered yes to any of these questions you need a Course Portfolio. A course portfolio can be a key asset in your professional development because they demonstrate what you did, why you did it and provide evidence that shows you were successful.

Are you going up for reappointment, or tenure, or on the job market? Do you have a Teaching Portfolio to demonstrate your effectiveness? Do you need a framework for collecting authentic student assessments, including work projects and reflections on learning? You might consider a Student Portfolio. Has your career evolved to running programs and other administrative responsibilities and you need to capture the work you do that is not teaching or research or service? An Administrative Portfolio may be the answer. All 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.

**8:00 A.M. - 8:50 A.M.      CONCURRENT SESSIONS A**

### **The Carbon Cycle Game**

AUD 420

Focus: Teaching and Learning

Cathy Middlecamp, [chmiddle@wisc.edu](mailto:chmiddle@wisc.edu)  
University of Wisconsin-Madison

For students, here are three talking points: 1) carbon is found in many places on the planet, 2) carbon moves from place to place, 3) and which place carbon ends up matters. To engage students in learning about carbon-related issues such as energy, food or climate change in a SENCER course, what better way to start a conversation about carbon than to play a game? In this session, participants play the Arctic version of the Carbon Cycle Game, moving among reservoirs of carbon found in the North. The game can be customized for play in different regions, and take-home directions for this customization will be provided. The equipment needed is easy to assemble: different colored glass or wooden beads, stretchy bracelet bands to string the beads, and posters for the 12 carbon reservoirs.

### **Designing Discussion Prompts for Cognitive Growth**

AUD 528

Focus: Teaching and Learning

Linden Higgins, [linden.higgins@uvm.edu](mailto:linden.higgins@uvm.edu)  
*University of Vermont*

This session will provide an opportunity to collaborate on discussion prompts aligned with student cognitive development and Universal Design for Learning. Students often come to their classes unprepared to work with open-ended questions. Several models of student learning suggest that this reflects prior experience in science as well as their cognitive development. By asking carefully designed questions, educators can support students' growing understanding, comfort with ambiguity, and use of evidence-based arguments. Different kinds of questions are appropriate for different pedagogical goals. Instructors may be seeking to confirm content knowledge, detect misconceptions, or guide practice of critical thinking and use of evidence. Examples will be offered that are aligned with different learning goals within the context of cognitive development and UDL. Session participants will work together to develop prompts and conclude with an open conversation about how to facilitate student discussions while creating a safe environment for dissent in this age of "trigger warnings" and anonymous threats.

**8:00 A.M. - 8:20 A.M.      PRESENTATIONS A**

**TWU Pollinator Garden Project**

AUD 628

Focus: Community Collaborations

Cynthia Maguire, [cmaguire@twu.edu](mailto:cmaguire@twu.edu)

*Texas Woman's University*

Increasing concerns about biodiversity in ecosystems has led a group of faculty at Texas Woman's University to propose adding an academic pollinator garden to the Denton campus. The TWU Pollinator Garden Project involves the transformation of campus lawn areas, which require a lot of water, fertilizer and maintenance, into a series of sustainable pollinator gardens. The primary goal of this project is educating students and local residents about sustainability issues, thus helping them become active citizens in finding solutions to current environmental issues, particularly regarding water and pollinator conservation. These gardens will create habitats for insects and birds, which underlie the biodiversity in all ecosystems, as well as serve as places of beauty for humans to refresh themselves. The plants in these gardens will be drought tolerant and require very little maintenance, thus contributing to water conservation and reduced pollution from pesticides and fertilizers.

TWU's pollinator gardens will serve as observatories and laboratories for undergraduate and graduate education, in sciences and throughout our curriculum. Students from many disciplines will be involved in planting, maintenance, research and civic outreach as they teach others to create sustainable spaces on their campuses, town squares or backyards. Partnerships with a variety of outside organizations to meet student learning objectives connect classroom theories to real-world experiences through practical application of knowledge. Students majoring in science fields will be able to develop research projects using the pollinator gardens. As students learn about environmental responsibility, they develop tools to educate the Denton community about environmental and sustainability issues and assist their fellow citizens in projects to promote environmental stewardship.

**CAPS: A Never Ending Resource in Teaching and Learning STEM Education**

AUD 426

Focus: Teaching and Learning

About Cherif, [aboutcherif@att.net](mailto:aboutcherif@att.net)

*American Association of University Administrators*

With amazing frequency, most of us will open a bottle and throw the cap away without thinking that it has any other use. However, while the end function of a bottle cap is the same for almost all types and materials, the caps use various mechanisms to achieve their main function. For a teacher, caps can have a multitude of educational and pedagogical uses.

In this "CAPS: A Never Ending Resource in Teaching and Learning STEM Education" project, we will offer participants some tools for understanding and using caps as valuable resources for teaching and learning various topics in STEM fields as well as to motivate students to engage in their own learning process. This session will provide detailed instructions, including some hands-on activities that will help faculty master the concepts and the pedagogy.

**MONDAY,  
AUGUST 1**



**Chicago Transportation Authority Bacterial Detectives**

AUD 628

Focus: Community Collaborations

Farah Movahedzadeh, fmovahedzadeh@ccc.edu

Bara Sarraj, bsarraj@ccc.edu

*Harold Washington College*

The goal of this initiative is to put SENCER ideals into practice by placing the scientific method and academic resources in the service of the community. This course-related activity allows students to “bacterial detectives” who will set up high hygienic standards for the college and community at large. Students screen public transportation facilities (Chicago Transportation Authority train system, or CTA) for evidence of bacterial growth, focusing on regularly touched areas such as poles, doorknobs and seat handles. Students identify these bacteria through the microbial techniques, grow and isolate these bacteria on nutrient agar plates and/or in nutrient broth tubes. Bacterial growth is determined via direct cell count (colony count) and microbial characteristics are investigated using microscopy, Gram staining and biochemical identifications. Results are shared with college to encourage the adoption of student-created, scientific hygienic standards. This project can be expanded into surrounding public places such as restaurants and fast food locations, where the public health is at risk.

**Incorporating Photo-Book of Concepts in Physics and Environmental Chemistry Classes**

AUD 426

Focus: Teaching and Learning

Nasrin Mirsaleh-Kohan, nmirsalehkohan@mail.twu.edu

Texas Woman’s University

The photo-book project, an experiential learning activity has been designed to allow students to analyze the relation of the subject matter to the real world with the purpose of enriching students’ understanding of the subject and reinforcing their appreciation of what they learn in a classroom. This project has been embedded in various classes such as physics, environmental chemistry, and climate change and also in community projects such as Earth week. In the photo-book project, students are asked to capture class concepts in pictures. This experiential learning encourages students to be more observant and search for examples in their world; and further allows them to freely express their interpretation of the subject and reflect on their learning.

The photo-book project has proven to be a valuable tool with great potential in terms of students’ learning, while being quite manageable for instructors and easily implemented in other classes and subjects. In this presentation, the details of the photo-book concept, a few poster presentations, examples of students’ comments, and an overview of this experiential learning model will be discussed.

9:00 A.M. - 9:50 A.M.

CONCURRENT SESSIONS B

**Regionalization Strategies for SENCER's National "Community of Transformation"**

AUD 420

Amy Shachter, aschacter@scu.edu  
Santa Clara University

Large-scale STEM reform initiatives often develop at the national level, but a regional and local strategy is critical to sustaining, scaling and spreading reforms and to increasing access to programs and resources. This session invites participants to connect with and review SENCER's existing regionalization strategy—the SENCER Centers of Innovation—and consider new ways to expand, organize, and institutionalize SENCER's regional and local activities during our next decade of growth.

**MetaLearning: Growing Self-Directed Learners**

AUD 528

Focus: Teaching and Learning

Stephen Carroll, scarroll@scu.edu  
Santa Clara University

In the 21st century, both professional and personal success depend on being able to adapt swiftly and effectively to rapidly changing circumstances. Thus, the most important skill college students need to learn is HOW TO LEARN independently, consciously and with maximum efficiency. In this work session, participants will learn by doing—experiencing brain-based learning activities and pedagogies that can be used to accelerate students' progress toward becoming effective self-directed learners.

Participants will recognize and understand some of the myths and misperceptions that inhibit students' ability to learn efficiently and effectively; acquire and practice techniques to overcome these barriers; be motivated to incorporate the latest scientific research/evidence about how people learn into their teaching practices; and leave the session with a set of resources and experiences that will allow them to quickly integrate what they've learned into their teaching practices.

9:00 A.M. - 9:20 A.M.

PRESENTATIONS C

**The New York State STEM Quality Learning Rubric and Its Application to SENCER Work**

AUD 430

Focus: Teaching and Learning

Nina Leonhardt, leonhan@sunysuffolk.edu  
Suffolk County Community College Continuing Education

A statewide team of STEM leaders from the NYS STEM Collaborative and the Empire State STEM Learning Network developed this flexible rubric, appropriate for all STEM disciplines from Pre-K-graduate school. This session will review the rubric and explore applications to SENCER-ized instruction beyond New York through interactions with the audience.

## **The Engaged Faculty Fellows Program**

AUD 434

Focus: Academic Leadership Development

Hitish Nathani, hnathani@alamo.edu

*St. Philips College*

The Alamo Colleges Office of Experiential Learning has developed a two-tier program to encourage faculty to incorporate civic engagement learning into coursework. Tier one involves using a faculty-on-loan model allowing a civically engaged faculty member to spend a year developing, engaging, and training other faculty. Tier two involves previously trained faculty developing and implementing courses that place a minimum of 10% of the course grade on the civic engagement component. This session will provide an overview of this initiative.

**9:30 A.M. - 9:50 A.M.      PRESENTATIONS D**

### **Working with Social Media and Case Studies**

AUD 430

Focus: Teaching and Learning

Thomas Wood, twood@gmu.edu

*George Mason University and the Galapagos Conservancy*

Expanding on SENCER and KQED's collaboration, *Do Now U*, this session will explore the use of case studies in a learning community and social media to expand comprehension of the relevance of current events to student engagement in current issues impacting society. The model course, *Mysteries of Migration* has been used to develop case study and social media use. The session will help participants consider using these practices in their courses.

### **Adding College Students to an Existing Inner City Community Garden**

AUD 434

Focus: Community Collaborations

Michou Saint Hubert, msainthubert@alamo.edu

Kathy White, kwhite@alamo.edu

*St. Philip's College*

St. Philip's College, designated as both a Historically Black and Hispanic Serving Institution, is located in the East Side of San Antonio, Texas. Six blocks from campus a community garden was established in 2008 by a group of neighborhood women, who were already "senior citizens" at that time. Over time, several elements of the college took an educational interest in the garden, including the Science Club, nutrition faculty, the culinary department, and the campus ministry. This began a partnership between young, enthusiastic college students who could lift, dig, carry, shovel, build, mulch, water, and stand the heat and the neighborhood women who taught the students about both gardening and the history of the area. The garden was later upgraded with a solar energy device to capture the sun's rays to power the radio and juicers, creating a beautiful garden. Over the eighteen months of involvement with the garden thirteen faculty representing six departments have become part of this project. This session will explain how this partnership came together, share best practices, and discuss next steps for the garden.

**MONDAY,  
AUGUST 1**

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

**ALL-INSTITUTE PLENARY SESSION V AND CLOSING THOUGHTS**

*Congress Lounge*

Amy Shachter, presiding

**Plenary Presentation: From Ideals to Transformation: A SENCER Journey**

*Alix Downing Fink, [finkad@longwood.edu](mailto:finkad@longwood.edu)*

Dean of the Cormier Honors College and Associate Professor of biology

*Longwood University*

**Closing Thoughts**

Wm. David Burns, [david.burns@sencer.net](mailto:david.burns@sencer.net)

*National Center for Science and Civic Engagement*

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

**LUNCH**

*Dining Center*

All Institute participants are invited to a final lunch in the dining center.

**MONDAY,  
AUGUST 1**

## BIOGRAPHICAL SKETCHES OF SSI 2016 PLENARY SPEAKERS AND SENIOR STAFF

**Adam Briggie** is a professor in the philosophy and religion department at the University of North Texas. His work has appeared in *The New York Times*, *The Guardian*, *Slate*, *Salon*, and *Truthout*. He is also the author of *A Rich Bioethics: Public Policy, Biotechnology, and the Kass Council*, which explores philosophy and policymaking through a case study of George W. Bush's President's Council on Bioethics, and is co-author of *Socrates Tenured* (with Robert Frodeman), which lays out a program of reform for philosophy and the humanities in a neoliberal, technoscientific age. He has been interviewed by NPR, BBC, and the *LA Times*, holds a PhD in Environmental Studies from the University of Colorado, and served for three years as a postdoctoral fellow working on the philosophy of technology at the University of Twente in the Netherlands.

Adam's latest book, *A Field Philosopher's Guide to Fracking*, chronicles his efforts to ban hydraulic fracturing for natural gas in Denton, Texas. Shortlisted for Columbia University's prestigious J. Anthony Lukas Book Prize, the book examines the grand-scale implications of fracking on a philosophical level—that our ability to innovate outstrips our capacity to think about the consequences of our actions. As a 'field philosopher,' and as leader of the grassroots, democratic Denton Drilling Awareness Group, Briggie led the successful Frack Free Denton campaign to ban hydraulic fracturing in Denton's city limits: an underdog victory for Denton, and now nationally recognized as a beacon for citizens' rights.

**Wm. David Burns** is the executive director of the National Center for Science and Civic Engagement, co-founder and principal investigator of SENCER, publisher of *Science Education and Civic Engagement - An International Journal*, and a Research Professor at Stony Brook University. He also serves or has served as principal investigator for the National Center's Great Lakes Stewardship Through Education Network (GLISTEN) project, Science and Civic Engagement: Western Network (SCEWestNet), SENCER-ISE, an initiative to connect formal science education at the college level with informal science educators (museums, aquaria, science journalists, etc.), and Engaging Mathematics, an initiative which applies the SENCER method to college-level mathematics courses, with the goal of using civic issues to make math more relevant to students.

Prior to establishing the National Center, David served as senior policy director for the Association of American Colleges and Universities (AAC&U). During his nine years with AAC&U, he established the Center for Disease Control and Prevention-sponsored Program for Health and Higher Education and created the Summer Symposia dedicated to exploring the power that students have to improve the health of colleges and communities. For 23 years, David was a member of the administration of Rutgers, the State University of New Jersey. David is the principal author and editor of the book, *Learning for Our Common Health*, and, among other publications, the article, "Knowledge to Make Our Democracy." In 2008, the American Society for Cell Biology honored David and SENCER co-founder Karen Kashmanian Oates with the Bruce Alberts Award for Excellence in Science Education. David's undergraduate and graduate work (at Rutgers) was in political science with a concentration on political theory. He was a Woodrow Wilson National Fellow.

**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.

**Alix Dowling Fink** is Dean of the Cormier Honors College and Associate Professor of biology at Longwood University. Alix's role has involved fostering collaborative interdisciplinary projects across the university, working with faculty in the arts and sciences and partners in student affairs. With a colleague in physics, she developed an interdisciplinary, topic-driven general education science course that was selected as a SENCER model in 2007, *The Power of Water*. Longwood's engagement with SENCER also generated a new capstone for the academic core. The course, *Exploring Public Issues through Writing*, is a transdisciplinary collaboration focused on the civic challenge of the stewardship of our public lands, with particular emphasis on Yellowstone National Park. In the course, which has been taught for 11 years, students approach a stewardship issue, such as managing invasive species, from the perspective of their experiences in general education and their major. In 2016, nearly 50 Longwood students will travel to Yellowstone as part of the program, and an additional 12 students will be partners in developing a new sister program in Alaska.

In addition to her work on general education, Alix has joined a departmental initiative to reframe the biology major curriculum to align with core principles of key STEM reform initiatives, including SENCER, AAAS's *Vision and Change*, and BIO2010. Alix currently serves as Co-PI for a new NSF-funded project that will use the SENCER approach to structure an interdisciplinary learning community for chemistry, biology, physics, and environmental science majors. Alix was elected to the SENCER Leadership Fellows Program in 2009, and serves as a PULSE (Partnership for Undergraduate Life Sciences Education) Fellow.

**Sean Gehrke** is Director of Institutional Planning, Research, & Assessment at Lewis-Clark State College. Prior to joining Lewis-Clark State, Sean Gherke earned his Ph.D. in urban education policy and higher education from the University of Southern California. His research focuses on organizational issues in higher education relating to social networks, leadership, organizational change, and educational reform, as well as how the college environment and student experiences influence learning and development. His experience as an administrator and researcher has contributed to his expertise in outcomes-based assessment, strategic planning, STEM reform, and leadership development.

**April Hill** is professor and chair of Biology at the University of Richmond. April is a recipient of the 2016 State Council of Higher Education for Virginia Outstanding Faculty Award. She is director of University of Richmond's HHMI-funded Undergraduate Science Education (URISE) program that focuses on building community support and research skills for incoming students who are from groups traditionally underrepresented in the sciences. She guided the development of, and teaches in, the interdisciplinary first-year research-centered STEM courses (Integrated Quantitative Science and Science, Math, and Research Training) that focus on real world problems like climate change, antibiotic resistance, and HIV. She also teaches in a Sophomore Scholars in Residence Living and Learning Program where students explore how the world's oceans shaped human experience through the course Out of the Sea. She is committed to social justice and uses her voice as a biologist in discussions of race at Richmond through involvement in a faculty learning community (Terms of Racial Justice). April is a PULSE (Partnership for Undergraduate Life Sciences Education) Leadership Fellow and works with the Southeast Regional PULSE to help life science departments reform undergraduate curricula around the principles of Vision and Change.

As an evolutionary developmental geneticist, she enjoys working on interdisciplinary research collaborations. She is passionate about undergraduate research and has advised more than 70 students in her laboratory over the past 15 years and many more students through authentic research experiences in a variety of biology courses (e.g., Evolutionary Developmental Biology, Genetics, Epigenetics, and Genomics). Her current research uses marine and freshwater sponges as model systems to ask questions about the gene regulatory networks important in the development of animal body plans and animal symbioses. This collaborative research is currently funded by the NSF Integrative Organismal Systems Program.

**Cindy Kaus** is an associate professor and chair of mathematics at Metropolitan State University in St. Paul, MN. She earned her bachelor's and master's degrees in electrical engineering at Arizona State University and her Ph.D. in mathematics at the University of Arizona. In 2014, Cindy was a Fulbright Scholar at the University of Seychelles, Africa where she taught Calculus, helped the university to develop their mathematics education program and began developing an environmental statistics course. She is also currently a Co-PI on the NSF funded grant "Engaging Mathematics – Building a National Community of Practice."

An advocate of incorporating civic issues in mathematics to reach groups of students typically underrepresented in the STEM disciplines, she has directed and co-directed various grants leading to curriculum reform in mathematics. In addition, she served as co-director of Mpower, a year round mathematics program for urban middle school girls. She has been rewarded for her service to women at Metropolitan State University and has won awards for her outstanding teaching at Metropolitan State University, the University of Minnesota and the University of Arizona.

To encourage teaching mathematics through civic issues, Cindy co-chaired a session at the Mathematical Association of America's MathFest 2008 entitled "Teaching Mathematics and Statistics through Current Civic Issues," hosted the 2009 Midwest SENCER Center for Innovation Fall Symposium entitled "Teaching Quantitative Reasoning through Civic Issues" and served as a visiting mathematician at the National Center for Science and Civic Engagement for the 2008-2009 academic year. Cindy was elected to the inaugural class of SENCER Leadership Fellows in July of 2008. Prior to coming to Metropolitan State University, Cindy was a visiting assistant professor of mathematics at the University of Minnesota and an electrical engineer at Honeywell Satellite Systems in Glendale Arizona.

**Ellen Mappen** is a senior scholar and the project director for Informal Science Education Programs at NCSCE. SENCER-ISE, an initiative funded by the National Science Foundation and The Noyce Foundation, looks to develop partnerships between SENCER faculty and informal science educators that benefit students and the general public. She was the founding and long-time director of the Douglass Project for Rutgers Women in Math, Science and Engineering (1986-2003). Under her direction, this initiative offered co-curricular activities at the precollege and undergraduate levels. Working with science, mathematics, and engineering faculty, she developed a research course for first-year students that involved small group projects and student presentations of their findings. She served as the course coordinator for number of years. Under her leadership, the project received the 1999 National Science Foundation's Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring. From 2003-2006, she administered a program for high school students in a health sciences high school located in New Brunswick, New Jersey and organized programs for these students at a local medical center. Her academic background includes a Ph.D. in history from Rutgers University. She has written on women's participation in the workforce in late nineteenth and early twentieth century Britain and on the role of co-curricular initiatives for encouraging women to enter STEM studies. She is one of the authors of a *Review of the Literature on Increasing the Representation of Women Undergraduates in STEM Disciplines Through Civic Engagement Pedagogies*, along with then graduate student David B. Knight and Professor Stephanie L. Knight of the Pennsylvania State University (SECEIJ, Winter 2011. 3(1): 36M47). She co-authored, with the late Alan J. Friedman, Ph.D., Consultant for Museum Development and Science Communication, "SENCER-ISE: Establishing Connections between Formal and Informal Science Educators to Advance STEM Learning through Civic Engagement" (SECEIJ, Summer 2011. 3 (2): 31M37). She and Dr. Friedman also co-authored a chapter, "Formal/Informal Science Learning through Civic Engagement: Both Sides of the Education Equation," in *Science Education and Civic Engagement: The Next Level* (eds. Richard D. Sheardy and Wm. David Burns (2012, ACS).

**Eliza Jane Reilly** is the deputy executive director of programs for the National Center for Science and Civic Engagement. has two decades of experience in the design and implementation of programs and materials to advance curriculum, academic leadership and faculty development. Her past roles include Executive Director of the American Conference of Academic Deans, Director of Programs at the Association of American Colleges and Universities, and most recently, Director of the Phillips Museum of Art at Franklin & Marshall College. Eliza is the General Editor of the SENCER Models, the co-Editor of the journal, a consultant to Engaging Mathematics, an advisory board member of SENCER-ISE, and a Research Professor at Stony Brook University.

**Danielle Kraus Tarka** is the deputy executive director of operations, community outreach, and engagement 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