

Saturday, August 8th

Notes on the Program

Breakfast, the plenary session, and the poster session will be held at the Palmer House Hilton. All other sessions will take place at Harold Washington College (see Maps section for walking directions).

7:00 – 8:30 a.m. **CONTINENTAL BREAKFAST**
Adams Ballroom, 6th Floor

7:00 – 8:30 a.m. **MEETING FOR CURRENT SENCER LEADERSHIP FELLOWS**
Spire Parlor, 6th Floor
Breakfast will be served.

8:30 – 10:00 a.m. **PLENARY SESSION**
Adams Ballroom, 6th Floor
David Ferguson, presiding

Introducing the SENCER Leadership Fellows

David Ferguson
Stony Brook University

SENCER and Gender Research

Ellen Mappen
National Center for Science and Civic Engagement

Recognizing Excellence

Debra Meyer
University of Pretoria

Plenary Address: What on Earth are We Doing?

Jay Labov
National Research Council

Cathy Middlecamp
University of Wisconsin Madison

10:00 – 11:00 a.m. **POSTER SESSION**
Exhibition Hall

We are pleased to invite you to attend a special poster session that features the work of SSI 2009 participants. Poster developers will be on hand to share their work, exchange ideas, and answer questions during the designated Poster Session time.

You will receive a “Poster Abstracts” booklet with your registration materials that includes descriptions of each project as well as contact information of session contributors. We hope that this booklet will facilitate meaningful exchanges during the institute and opportunities to follow-up with colleagues after the Institute.

11:00 a.m. **WALK TO HAROLD WASHINGTON COLLEGE**

11:15 – 12:30 p.m. LUNCH
Room 101/102

12:30 – 1:45 p.m. CONCURRENT SESSIONS

Re-inventing Teaching: Is it Ok for Every Student to Earn an A?

Room 614

Themes:	Theory/Rationale Pedagogy	Assessment/Evidence SENCER in the Majors
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Terry McGuire, mcguire@biology.rutgers.edu
Rutgers University

Abstract: This session will provide an opportunity for participants to discuss the SENCER Backgrounder, “Reinventing Myself as a Professor: The Catalytic Role of SENCER,” with its author, Terry McGuire. In the backgrounder (available on the SENCER website), the author describes “the drunkard’s walk” that he has traveled since first attending the SENCER Summer Institute. While doing so, he enumerates the many effects that work with colleagues at the Institute and other faculty members have had on his teaching. Perhaps most of all, what has changed for the presenter is his view of, and relation to, his students. In essence, it has now become important to McGuire that all his students do “A work” and that they really learn what the course aims to teach. In the session, he will discuss how his changed view and the strategies he has adopted to improve learning by majors have now produced results—tangible evidence of improved learning in the sciences—that are inspiring to him as a teacher and deeply gratifying for students. While the presenter will offer some suggestions and conclusions that participants might find useful, the overall goal is to provide an opportunity for others to talk about their own experiences and to join in the process of reinvention.

What will be accomplished: Participants will reflect on their own journeys as a faculty members and teachers.

Results: Participants will reflect on how they teach their courses now and commit to change at least one thing in at least one course to make learning more enjoyable and more effective for the students and themselves.

The Basics of Community-Based Research

Room 608

Themes:	Pedagogy Theory/Rationale	Community Engagement Assessment/Evidence
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Amy Shachter, ashachter@scu.edu
Santa Clara University

Abstract: This session will explore the basic tenets and practices of undergraduate Community Based Research for both science and non science and majors alike. Together we will discuss the practice as it relates to the National Research Council's guidelines for best practices in science teaching and as it supports the missions of many of our colleges and universities. We will review the aims and objectives of this experiential learning practice and provide time to work on connecting curriculum to authentic discovery-based research practices and assessment.

What will be accomplished: Participants will (1) formulate a working definition of undergraduate research and community-based research, (2) relate the research experiences to civic engagement, and (3) propose ways to integrate research into the undergraduate experience at their institution.

Results: Relating to their own courses and institutions, participants will be able to (1) describe the value of research opportunities to the undergraduate experience in the context of national standards, (2) outline learning outcomes related to research experiences, and (3) design assessment strategies including measures of success and student self-assessment of learning gains.

Adapting Large Lecture Formats to SENCERized Teaching and Civic Engagement

Room 323

Themes:	Pedagogy Assessment/Evaluation	Partnerships Large Classes
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Garon Smith, garon.smith@umontana.edu
University of Montana

Abstract: Is it possible to engage large, content-driven lecture classes for SENCERized teaching and civic engagement? Absolutely! *Chemistry 151* (soon to be CHMY 121), a SENCER course at The University of Montana, successfully engages an annual student population of 800 students in addressing looming societal issues with science components and following up on them with civic action. After introducing the relevant topics during class-time, an “extra credit” mechanism subtly entices students to participate in related outside-of-class activities. In addition, other community-related science engagement activities are offered – after-school mentoring of at-risk students, attending or testifying at local policy formulation hearings, chairing sessions at our campus undergraduate research conference, judging at grade school science fairs and staffing stations at our city’s annual household hazardous waste clean-up days. Graphical presentations of raw course averages versus extra credit points reveal that students across the entire range of academic performance take advantage of the “extra credit” opportunity. Responses collected during administration of the SENCER SALG support the student appeal and utility of this course strategy.

What will be accomplished: Participants will (1) recognize that the “extra credit” strategy involves a minimum of “time stealing” from content delivery so that this mechanism can be used in majors just as easily as in non-majors courses; (2) be alert to choosing example problems based on real-world, local issues that respect the interests of the students but also support the course content; (3) appreciate that getting the students active in the community is a win-win-win situation – students get to work on actual problem solving, the community gets “free” labor out of the students, the institution gains invaluable town-gown public relations points.

Results: Other faculty will consider adopting the same strategy in their own courses and we will form an informal group to share ideas and success stories for implementing a similar strategy.

SENCER: An Institutional Approach

Room 603

Themes: SENCER in the Majors

Large Implementations

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

Abstract: Kapi'olani Community College is currently implementing and evaluating three NSF grants. In just three years, the number of students pursuing our two-year STEM-ASNS degree has climbed to 60. The College's new strategic plan has set a benchmark of 300 STEM-ASNS degree students by 2015, and an annual increase in STEM baccalaureate transfer of six percent for Native Hawaiian and three percent for all students. Through an NSF-Innovation Through Institutional Integration award, the College is using a self-developed tool called the "Assessing Institutionalization Map" (AIM) to align its major functions with these degrees and transfer benchmarks. In its first implementation in spring 2009, curriculum and partnership functions were scored at a very low level. The purpose of our SENCER engagement is to strengthen these two functions through a focus on both content and context in undergraduate science courses.

Inquiring into Our Students' Learning – The Scholarship of Teaching and Learning

Room 604

Themes: Assessment/Evaluation

Course Design

Matthew Fisher, matt.fisher@email.stvincent.edu
Saint Vincent College

Abstract: The scholarship of teaching and learning has been described as inquiring into our students learning. But what does that look like in real life? How does this work help to make teaching public and community property? How does this form of scholarship connect to the concerns of faculty involved in SENCER? This session will provide an overview of the scholarship of teaching and learning through the work of faculty who have been actively involved in SENCER and participated in the SoTL workshops that were offered as part of the 2007 and 2008 Summer Institutes. Through examination of these projects and related work by faculty involved in SENCER, participants will develop an understanding of important characteristics of the scholarship of teaching and learning. The session will also provide information about resources and tools for engaging in this work.

What will be accomplished: This session will provide participants with an overview of the characteristics of the scholarship of teaching and learning, the resources and tools for engaging in SoTL, and an opportunity to identify questions they would like to pursue with SoTL approach

Results: Participants will be able to identify questions arising in their own teaching that would be suitable starting points for a SoTL project and identify appropriate tools and resources for pursuing a SoTL project.

The Use of Critical Thinking Performance Tasks to Connect Undergraduate Science Education with Civic Engagement

Room 602

Themes: Assessment/Evaluation

Liza Bolitzer, lbolitzer@cae.org

Marc Chun, mchun@cae.org

Council for Aid to Education

The higher order skills (critical thinking, analytic reasoning and problem solving) that both support civic engagement and are goals of undergraduate science education (Levine, 2006) can be developed through Critical Thinking Performance Tasks (CTPTs). The importance of this connection is supported by research that indicates that sustainable knowledge occurs when students are able to see the applicability of big ideas in diverse situations (Bransford et al, 2001). CTPTs are a form of problem based learning and authentic assessment that emerges from the work of the Collegiate Learning Assessment (CLA). CTPTs are designed so students learn to see a problem like an expert (consistent with the work of Bransford et al, 2001). CTPTs also employ a diagnostic rubric that provides students with feedback on higher order skills, facilitating a direct link to their civic life. Further, opportunities to help students develop metacognition through rubrics for self-assessment will also be presented.

What will be accomplished: The presentation will draw explicit connections between the skills developed in undergraduate science courses and forms of civic engagement using CLA Critical Thinking Performance Tasks as examples.

Results: Faculty will be able to (1) help students understand how their science courses help them to develop higher order skills with applications both in science settings and civic life, (2) understand how Critical Thinking Performance Tasks provide a means for students to practice and develop higher order skills, and (3) create and/or use diagnostic rubrics that connect undergraduate science course content to civic engagement.

Featured Model Panel: Energy and the Environment and Science, Society, & Global Catastrophes

Room 618

Themes: Disciplinary

Theory/Pedagogy

Trace Jordan, trace.jordan@nyu.edu

New York University

Theo Koupelis, tkoupelis@edison.edu

Edison State College

Abstract: The authors of two SENCER model courses will review their adaptations of the SENCER approach to different disciplines that nevertheless address some of the same phenomena. *Science, Society, & Global Catastrophes* is a team-taught, interdisciplinary course that focuses on the nature, excitement, and role of scientific inquiry as a means of solving real-world problems through research and collaboration. By using the fundamental unifying principles of the natural sciences, it puts in scientific context important public issues such as past and possible future catastrophes that did and can affect our environment (e.g., plagues, extinctions, global warming, ozone depletion, nuclear winter, collisions with space debris, etc.). *Energy and the Environment* is a course offering within the large-scale Foundations of Scientific Inquiry

program at NYU. The course typically enrolls between 120 and 130 students in a large lecture class, with laboratory sections of 20 students. The course uses contemporary environmental issues, including global warming, the ozone layer, and water quality, as a framework for introducing foundational principles of chemistry, such as atomic and molecular structure, chemical reactivity, and thermodynamics.

What will be accomplished: The facilitators will discuss how the courses came about, as well as what types of assignments, activities, and assessments have been used.

Teaching Scientific Methods Through Civic Engagement

Room 621

Themes:	Teacher Preparation Service-Learning Multi-disciplinary	Online Courses Case Reports
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Norbert Cordeiro, ncordeiro@roosevelt.edu

Robert Seiser, rseiser@roosevelt.edu

Roosevelt University

Abstract: *The Nature of Science* is an introductory-level class at Roosevelt University that is offered in both online and classroom formats. The course introduces students to the philosophy of science and the use of scientific methodology. In-class discussions address contemporary issues in science and technology that are selected by students and instructors. Students gain direct experience with experimental design, hypothesis testing and data analysis by carrying out individual research projects. Many students select topics that are close to home, such as transportation, nutrition habits, and anti-smoking ordinances. Social justice and the broader impacts of scientific innovation are explored through these and other course activities. Participants in this session will learn about a process-oriented approach to general education science instruction and will perform their own experimental design with an eye toward civic engagement. We will also discuss the pros and cons of this approach and its challenges to students and instructors.

What will be accomplished: We hope to inform new and alumni SENCER participants about discipline-independent approaches to practical science education, stimulate discussion about the meaning of service-learning and civic engagement among practitioners of science, and obtain feedback about the course and our approach to general education science instruction.

Results: Participants will be able to better understand connections between science as practiced and science as taught, devise ways to incorporate scientific method and philosophy of science into their courses, and incorporate civic engagement and community outreach into project-based courses at their institutions.

What Works, What Needs to Be Modified, and What Needs to be Scrapped: Strategies to Increase Enrollment, Retention, and Diversity in the Sciences

Room 606

Themes:	SENCER in the Majors Diversity	Partnerships Community Engagement
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Maria Curtin, mcurtin@stonehill.edu
Stonehill College

Abstract: This interactive session will cover different strategies used to attract and retain science majors, especially in relation to underrepresented minorities. The Stonehill College chemistry department's effort to implement an innovative way to teach general chemistry is a good starting point for a discussion. Stonehill has partnered with Massasoit Community College and is using several strategies including the incentive of offering early research experiences in the sciences to improve student performance. These initiatives are funded by an NSF-STEP grant. In addition to the new general chemistry pedagogy, we have other initiatives such as mentoring and research opportunities for students in their first and second year. The group is collecting SALG evaluations of general chemistry sections using the new theme-based integrated lecture-lab chemistry approach vs. the traditional approach, and expects to have results to report shortly.

They have also have tracked students through the first two years to see how these experiences have affected their performance and choice of major.

What will be accomplished: Faculty will develop a general understanding of what are the most useful approaches to engaging students in the sciences.

Results: Participants will increase dissemination of successful strategies to attract and retain students in the sciences with other institutions and increase collaboration, think of new ways to adapt strategies so they are more useful to their institutions, and understand better why some strategies do not work.

SENCERizing Tutors

Room 605

Themes:	Civic Engagement Mathematics	Case Reports Writing
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Sarah Hansen, sarah.hansen@metrostate.edu
Cindy Kaus, cindy.kaus@metrostate.edu
Jenni Runte, jenni.runte@metrostate.edu
Rikki Wagstrom, rikki.wagstrom@metrostate.edu
Metropolitan State University

Abstract: We will relate our recent summer experience developing math and writing tutor workshops and materials to support SENCERized curricula in mathematics and statistics at Metropolitan State University. We will also report on our efforts to help faculty create effective written assignments. We plan to report on the results of our own SALG, customized to include tutor-specific math and writing outcomes and administered to our tutors. We will illustrate our successes and our not-so-successes with anecdotes from the tutor floor and math classroom, and invite comments and suggestions for how we can improve our training and support for tutors in future semesters.

What will be accomplished: We will advocate for inclusion of and appreciation for tutoring and other academic support systems for students and faculty in SENCER-ized courses and highlight the good work that tutors do to help students accomplish their learning outcomes.

Results: Participants will be able to recognize the intrinsic value of tutoring and other academic support programs, and reach out to and work with academic support programs at their institutions.

Life Amid the Maddening Crowd – Traffic in Atlanta and Beyond

Room 607

Themes:	SENCER in the Majors	Environment
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Keith Aufderheide, kaufderheide@oglethorpe.edu

John Cramer, jcramer@oglethorpe.edu

Lynn Gieger, lgieger@oglethorpe.edu

Oglethorpe University

Abstract: Traffic has been a cultural onus for millennia, but the focus of our new two-hour SENCER course was on traffic of the more recent automotive variety. Our target audience consisted of second-semester STEM majors, particularly those who might be at academic risk, although the course was open to all takers. Meeting 90 minutes per week, the in-class discussions focused on topics as varied as data collection and analysis, hypothesis testing, and physical, chemical and psychological effects associated with traffic. Class members interacted with guest speakers and participated in fieldtrips (including an overnight excursion to Washington, DC). Finally, five groups of three students each developed and then implemented their own research projects concerning traffic. Those who attend this presentation can expect to find out how a year-and-a-half of planning was important but formative fine-tuning was no less so in light of a startling number of unanticipated logistical and pedagogical conundrums.

What will be accomplished: We would like to acquaint our audience with some of the exciting things that have been going on at Oglethorpe during the past two years as a result of our affiliation with SENCER. Second, we would like to share our vision for this course, and contrast that vision with the reality of its implementation, not only as a way of analyzing our successes and failures but also as a way of noting what we have learned and what we would do differently in the future. To some extent, we anticipate that these lessons would cross institutional and disciplinary bounds. Finally, we would like to interest other groups in exploring the topic of traffic, particularly with an eye toward developing inter-institutional collaborations.

Results: Participants will be able to (1) jump into their first SENCER course with less trepidation than we felt, (2) think about how and why they might like to implement a traffic course on their own campus and (3) come to understand that the logistical and pedagogical issues we faced probably transcend the particular topic of traffic, meaning our experience perhaps models what any group can expect to confront when they offer their first SENCER course.

2:00 – 4:00 p.m. COLLOQUIA FOR NEWCOMERS AND ALUMNI

Newcomers Colloquium: SENCER in Theory and Practice

Room 323

Themes:	Planning Civic Engagement Pedagogy	Theory/Rationale Assessment/Evidence
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David Burns (chair), david.burns@sencer.net
National Center for Science and Civic Engagement

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

Eliza Reilly, eliza.reilly@fandm.edu
Franklin & Marshall College

This is a repeat of a colloquium held on Friday, August 7th. Please go to page 8 in the August 6th & 7th tab to read the session abstract.

Newcomers Colloquium: SENCER – A Basic Design Exercise

Room 602

Themes:	Course Design	Theory/Rationale
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Ellen Goldey (chair), goldeyes@wofford.edu
Wofford College

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

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

This is a repeat of a colloquium held on Friday, August 7th. Please go to page 9 in the August 6th & 7th tab to read the session abstract.

Newcomers Colloquium: Incorporating Civic Engagement

Room 604

Themes:	Pedagogy Civic Engagement	Theory/Rationale
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Amy Shachter (chair), ashachter@scu.edu
Santa Clara University

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

Glenn Odenbrett, glennodenbrett@aol.com
Western Reserve Resource Conservation and Development Council

Pamela Proulx-Curry, pamela.proulx-curry@uwex.edu
Wisconsin Campus Compact

This is a repeat of a colloquium held on Friday, August 7th. Please go to page 10 in the August 6th & 7th tab to read the session abstract.

Newcomers Colloquium: Active Pedagogies

Room 203 D/E

Themes:	Pedagogy	Theory/Rationale
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Monica Devanas (chair), devanas@ctaar.rutgers.edu
Rutgers University

Marion Field Fass, fassm@beloit.edu
Beloit College

Theo Koupelis, tkoupelis@edison.edu
Edison State College

Garon Smith, garon.smith@umontana.edu
The University of Montana

This is a repeat of a colloquium held on Friday, August 7th. Please go to page 9 in the August 6th & 7th tab to read the session abstract.

Newcomers Colloquium: Effective and Inclusive Teamwork

Room 1001/1002

Themes: Faculty Development Partnerships

David Ferguson (chair), dferguson@notes.cc.sunysb.edu
Stony Brook University

Cindy Kaus, cindy.kaus@metrostate.edu
Metropolitan State University

Robert Sanford, rsanford@usm.maine.edu
University of Southern Maine

SENCER approaches often lead to learning environments that are highly interdisciplinary, reflective of democratic principles, and exemplars for the effective use of cooperative and constructive approaches to learning. Success in the design, marketing, implementation and assessment of such learning environments demands diversity: different types of populations (students, administrators, faculty, staff, and non-institutional collaborators), and the richness that it is derived from multiple backgrounds and perspectives. Given the need for such diverse talent, it is no wonder that so many SENCER projects seek ways to build more effective and inclusive teams. This session is designed to address several issues: (1) how do SENCER projects support/promote interdisciplinarity, multi-discipline teams, (2) how the SENCER approach is especially well suited to help with recruiting and promoting academic success for previously underrepresented students in STEM fields (including women, African Americans, Latinos, and Native Americans), (3) what are exemplary approaches to building effective teams in SENCER projects, and (4) what are ways of making students more integral parts of all phases (design, marketing, implementation, assessment, revision) of SENCER projects?

Alumni Colloquium: SENCER and Educational Policy – The Challenges of the New Economy

Room 606

Themes: Dissemination Reform

Jay Labov (chair), jlabov@nas.edu
National Research Council

Myles Boylan, mboylan@nsf.gov
Karen Kashmanian Oates, koates@nsf.gov
National Science Foundation

The current economic crisis has forced most colleges and universities to re-examine their programs, course offerings, and even their educational missions. Much of this discussion has focused on the challenges of today. But could these challenges also serve as catalysts to re-envision the roles and future of undergraduate education? How and what can the STEM disciplines contribute to new emphases and alignments of undergraduate teaching and learning? What lessons from the SENCER approach to undergraduate education might help inform such transformations? Through a combination of short presentations and small- and larger group discussions, this colloquium will explore all of these issues. Participants will be asked to provide examples of challenges that their institutions are currently facing. These will be used as the basis for conversations about re-envisioning the future of undergraduate education.

Alumni Colloquium: Advanced Issues in Assessment

Room 614

Themes:	Assessment/Evaluation	Theory/Rationale
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Stephanie Knight (chair), slk44@psu.edu
The Pennsylvania State University

Stephen Carroll, scarroll@scu.edu
Santa Clara University

Matthew Fisher, matt.fisher@email.stvincent.edu
Saint Vincent College

Jeannette Haviland-Jones, baljones@rci.rutgers.edu
Terry McGuire, m McGuire@biology.rutgers.edu
Rutgers University

This will be an opportunity for the coordinators of SENCER's assessment initiatives to share information on plans for future research and evaluation, including types of studies SENCER is considering sponsoring. Participants will be invited to comment on a rubric SENCER staff have assembled, and to discuss how we can measure and track "faculty transformation." Educators, administrators, and students interested in possibly collaborating on research projects and having an advanced and sophisticated discussion of the next generation of SENCER assessment efforts are encouraged to attend.

Alumni Colloquium: SENCER Across the Curriculum – Focus on Administrators

Room 608

Themes:	Faculty Development Reform	Dissemination
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Edward Katz (chair), ekatz@unca.edu
Keith Krumpe, kkrumpe@unca.edu
University of North Carolina at Asheville

DonnaJean Fredeen, fredeend1@southernct.edu
Southern Connecticut State University

Dennis Lehman, dlehman@ccc.edu
Harold Washington College

This is a repeat of a colloquium held on Friday, August 7th. Please go to page 11 in the August 6th & 7th tab to read the session abstract.

Alumni Colloquium: SENCER and Informal Science Education Collaborations

Room 618

Themes:	Partnerships Dissemination	Theory/Rationale Community Engagement
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Ellen Mappen (chair), ellen.mappen@ncsce.net
National Center for Science and Civic Engagement

Richard Duschl, rad19@psu.edu
The Pennsylvania State University

Brian Hagenbuch, hagenbuchb@hartwick.edu
Hartwick College

Tom Wood, twood@gmu.edu
George Mason University

SENCER and Informal Science Education (ISE) Collaborations will examine the theoretical connections between informal and formal STEM education, especially around the framework of learning through civic engagement and the study of civic issues. The session will highlight two specific informal/formal science education approaches and present a brief overview of future plans to enhance the connections. Through small group discussions, we will also examine what steps and supports are needed to enhance collaborations SENCER faculty have or could have with the ISE community.

4:00 – 5:30 p.m. SCHEDULED TEAM TIME AND REGIONAL NETWORKING FOR INDIVIDUALS

Teams should use this time for meeting. Other participants who interested in learning more about the SENCER Centers for Innovation are invited to meet informally with the co-directors and members of the Leadership Councils attending SSI 2009.

SCI – Midatlantic: Room 203 D/E
SCI – Midwest: Room 1001/1002
SCI – New England: Room 602
SCI – South: Room 323
SCI – West: Room 607

5:30 – 7:30 p.m. DINNER FOR SENCER LEADERSHIP FELLOWS, SENIOR FELLOWS, AND SENIOR SCHOLARS *Room 1115* *By Invitation Only*