

2016 MRSEC Education Share Session

November 2016

Brandeis University

The Brandeis MRSEC and Waltham High School Science Pizza Talks

Integral to our partnership with Waltham Public Schools is the on-going monthly High School series given by Brandeis scientists (with free pizza) for students and teachers called, "The Brandeis MRSEC and Waltham High School Science Pizza Talks." These extremely popular talks occur during two different lunch periods so that any student can easily attend them. Research suggests that role models are important for motivating students to persist in STEM fields so series speakers describe their journeys into science and highlight moments when they overcame challenges or defied expectations.

Columbia University

Near-peer Mentoring, Lab Visit Curriculums and Elements of Successful School Partnerships.

The dyad model whereby high school students are paired with other students during a summer research program provides several benefits: a) opens doors and retains students in STEM field b) training for mentors such as undergrads and postdocs c) allows sharing of academic, social and cultural experiences. The students immersed in Columbia's outreach programs are able to take advantage of peer and faculty interactions, an increased knowledge of scientific research and career readiness.

Cornell University

Lending Library of Experiments

The CCMR Educational Programs Office provides educational resource for teachers, the Lending Library of Experiments. The Lending Library offers lesson plans and student activity sheets available for download on a wide variety of science topics that are being designed to meet the Next Generation Science Standards. We are adding activity sheets in Spanish. Kits also exist for many of the activities, which can be checked out free of charge, to help teachers facilitate the activity in the classroom.

Duke University - NC State University - UNC Chapel Hill - NCCU

SENSOR Saturday Academy

The Research Triangle MRSEC has contributed to a year-long outreach program designed to enhance the exposure of 8th graders from underrepresented minority groups to science and engineering. The importance of materials is emphasized throughout the program, and MRSEC participants contribute to lab tours, research presentations, and panel discussions.

Harvard University

Reaching Non-traditional Students: Providing Opportunities for Veterans and Community College Students

Non-traditional students who participate in summer research opportunities can bring new perspectives and experiences to your cohort. The Harvard MRSEC would like to share strategies for engaging community colleges and veterans, and work with other MRSECs who are interested in these student groups, as well as student from Tribal Colleges.

Massachusetts Institute of Technology

Community College Partnerships

The MIT MRSEC has a multi-faceted partnership with two local community colleges where the underrepresented minority student enrollments are >50%. It operates a dedicated REU program for students from the community colleges. Through this program, the students gain research experience that is not available at their home institutions, thereby developing the skills and confidence to continue their education and pursue careers in science and engineering. To date, 59 students have completed the program, the majority of whom have subsequently enrolled in bachelor's programs, and some in graduate programs. This successful program has been expanded over the past few years to provide faculty from the same community colleges with research opportunities through the MRSEC's RET program. In addition, faculty and students visit the MRSEC Shared Experimental Facilities, some of whom make use of the instruments for their own or class-related research projects.

New York University

NYU-MRSEC Outreach Overview

Current direction, partnerships and future direction of NYU-MRSEC outreach in NYC.

Northwestern University

Engineering Trans-disciplinary Outreach Program in the Arts (ETOPiA)

ETOPiA is a production that uses theater to inspire a cross-disciplinary dialogue about the various roles of science and technology in society. This is an outreach program for audiences of students and the general public.

Ohio State University

Master's-to-PhD Physics Bridge Program Facilitates Admissions and Program Reflection and Evaluation

The Master's-to-PhD Physics Bridge Program has had great impact on Ohio State's physics graduate admissions, curriculum and student retention. The program is reflecting on its policies by evaluating student course placement during the first year based on assessment originally done with Bridge students that has carried over to the entire incoming class; the addition of group tutorial sessions, enabled by MRSEC support, for some core courses and will begin investigating the overall graduate student experience and factors impacting retention.

Pennsylvania State University

Accessibility to STEM for Students Who are Blind or Visually Impaired

After piloting a half-day program in July 2016, the Center for Nanoscale Science is leading an effort to implement a 4-day STEM extension to an existing college-transition and preparation program for students who are blind or visually impaired. The project builds upon longstanding partnerships with Penn State's Science U summer camp program and instructional staff in the Physics & Chemistry departments.

Princeton University

Discussion of the Princeton MRSEC Broader Impacts

I will recap the MRSEC educators network past efforts in creating cross center MRSEC logic models of our programs to facilitate collaboration and improve planning and communication of our programs across disciplines. I will show how that directly connects, and discuss new plans for science communication professional development from Portal to the Public to provide key beneficial professional development for graduate students and postdocs and improve the effectiveness of our programs.

University of California at Santa Barbara

Art+Energy K-12 program

This art/science activity focused on spatial awareness and the fourth grade energy curriculum; fourth graders designed a lighted village using drawable circuits and aerial photographs of their school's neighborhood. The students' final project was exhibited alongside professional artist installations at the first Isla Vista Lightworks Celebration in 2016. The project highlights cross-campus and community collaborations with the UCSB Art Department, Isla Vista Elementary School and the Pearl Chase Foundation.

University of Chicago

Reviving the Upper-Midwest Student Symposium??

An initiative started circa ~2003 between the four upper-Midwest MRSECs in existence at that time, provided opportunities for graduate students to present their research to a wider academic audience. Each symposium had a common scientific theme to enable more fruitful and in-depth discussion, and allow students from proximate MRSECs with similar backgrounds to learn about each others' academic environments. However, as time went on, the goals of this symposium evolved (e.g. postdocs were invited to give talks, and some faculty were keynote speakers) and as the Directors turned over and the difficulty of the MRSEC competition intensified, this event has been placed on the back burner (at least by Chicago). I would like to ask whether this type of activity is still needed, and whether proximity is still a necessary condition or whether common research interests/themes should be the primary focus.

University of Colorado Boulder

MRSECs Sharing Instructional Materials to Increase Impact

CU Boulder's Soft Materials Research Center members developed and implemented a new lesson that expands upon the UW-Madison activity "Liquid Crystal Sensors". This new lesson, "Detection of Volatile Analytes Using a Liquid Crystal Based Sensor" is aimed for middle and high school students as part of the Center's Nanoworld Series.

University of Michigan

REU

Discuss a plan for a MRSEC REU gathering at Argonne National Laboratory for the 2017 REU cohort.

UMN MRSEC Materials Week Program

The University of Minnesota MRSEC has developed a week-long summer experience for high school students highlighting the research of the IRG and Seed faculty. Each IRG has developed a series of activities designed to teach Materials concepts that can be used interchangeably depending on the age and interest of the students. The MRSEC organizes two summer camps using the Materials Week programming including one specifically for American Indian students. In addition to the summer camps, these activities are adaptable to shorter visits by students during the academic year and are presented annually for 200-plus American Indian students at the American Indian visit day- organized in collaboration with the UMN Admissions office to encourage enrollment in STEM fields at UMN. Examples of current activities include: *"Polymer Day: You Make It, You Break It"*, *"Electronic Materials in Technology"* (IRG-I), and *"Nanoparticles: Making, Seeing, Integrating, and Putting Them to Use"* (IRG-II).

University of Nebraska

UNL MRSEC Science Slams

Science Slams are innovative science communication contests in which graduate and undergraduate researchers from all scientific disciplines are challenged to communicate their work in short, dynamic presentations, with a winner decided by the audience. Nebraska MRSEC held the first Science Slam on the University of Nebraska-Lincoln campus - and the first event of its kind in the United States -- in March 2016.

University of Pennsylvania

Setting up and Running a Science Cafe

A relatively simple and inexpensive way of increasing interaction with the general public. We have been presenting monthly, materials-based talks for six years at two venues, one in Wilmington, DE and one in Philadelphia, PA with over 100 talks presented to an estimated audience of over 4,000.

University of Utah

Young and WISE Program

This is an after school program that we started at a high school with high diversity. Women in our MRSEC travel out to the school twice a month to provide activities, tutoring, and mentorship to women at the school.

University of Wisconsin-Madison

Science Communication Practicum: Improv to Improve Science Communication and Teaching

The UW MRSEC collaborated with the Delta program, a future faculty professional development program, and a local theater company to develop an 8-week graduate practicum that uses improvisation technique to develop formal and informal science communication skills. We've also created a training institute to enable instructors from other institutions to teach the course to their own graduate students.

Yale University:

MRSEC Collaborative Shared Exhibit to Broaden Participation

CRISP will collaborate with other MRSECs to assemble a traveling exhibit available for use at national meetings. The focus will be on showcasing the collective strengths of the MRSEC network with the goal of recruitment to broaden participation in STEM. I will briefly discuss the most recent very successful booth at SACNAS in Long Beach.