

# MRSEC Education Directors Meeting

September 28, 2012  
Chicago



# Updates

- **MRSEC Representation at NSF JAM**
  - Dan Steinberg and Frank Snowden
- **Netway Project**
  - Summary from Trochim group
- **Undergraduate Research Student Self Assessment [URSSA] REU Project**
  - Presentation by Tim Weston
- **Project FOCIS Collaboration**
  - Presentation and workshop by Dr. Robert Tai

**JAM** = Joint Annual Meeting;


**FOCIS** = Framework for observation and categorization of interest in science

# Update: NSF JAM

- **NSF Joint Annual Meeting [JAM]: Broadening Participation Research** – June 12-15, 2012; Washington Hilton Hotel.
- Attended by Dan Steinberg and Frank Snowden



# Update: NSF JAM



### Materials Research Science and Engineering Centers

Materials Research Science and Engineering Centers are approved by the NSF to undertake materials research of scope and complexity that would not be possible under traditional funding of individual research projects.

#### These Centers:




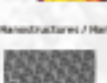


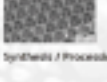

- require outstanding research quality, intellectual breadth, interdisciplinarity, flexibility in responding to new research opportunities, support for research infrastructure, and they foster the integration of research and education in the materials field
- address fundamental, complex problems of intellectual and societal importance
- contribute to national priorities by fostering active collaboration between academia and other sectors
- are the basis for a national network of university-based Centers in materials research

#### Who We Are

|                                       |   |
|---------------------------------------|---|
| Brunel University                     | University of Massachusetts Lowell        |
| Columbia University                   | University of Alabama                     |
| Cornell University                    | University of California at Santa Barbara |
| Duke University                       | University of Chicago                     |
| Georgia Institute of Technology       | University of Colorado                    |
| Harvard University                    | University of Michigan                    |
| Massachusetts Institute of Technology | University of Minnesota                   |
| New York University                   | University of Nebraska                    |
| Northwestern University               | University of Pennsylvania                |
| Ohio State University                 | University of South Florida               |
| Pennsylvania State University         | University of Wisconsin-Madison           |
| Purdue University                     | University of Utah                        |
|                                       | Yale University                           |

### Research

Each MRSEC encompasses one or more interdisciplinary Research Groups (RGs). The RGs in a Center may be closely related, or they may address different topical aspects of materials research; they contribute to the synergy arising from the research and education activities of the Center and to common infrastructure, shared facilities and outreach programs. Thus, the Center as a whole is expected to be more than the sum of its parts.

|  |  |  |
|--|--|--|
| <b>Biomolecular / Biomimetic Materials</b><br>            | <b>Condensed Matter Phenomena</b><br> | <b>Coatings / Ceramics</b><br>        |
| <b>Multiferroics / Magnetism / Spintronics</b><br>        | <b>Mechanics of Materials</b><br>     |  |
| <b>Nanodevices / Photonics / Organic Electronics</b><br> | <b>Polymers</b><br>                  | <b>Hard Focused</b><br>              |
| <b>Nanofabrication / Nanoparticles</b><br>              | <b>Synthetic / Processing</b><br>     | <b>Soft Materials, Colloids</b><br> |

### Shared Facilities- Materials Research Facilities Network


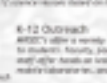

The Materials Research Facilities Network (MRFN) is a nationwide partnership of NSF supported MRSEC centers designed to provide support to researchers in the broad area of materials research in academic, government and industrial laboratories around the world.

### Education and Human Resources

MRSEC offer educational outreach programs in science and technology for elementary, middle, and high school (K-12) students and teachers, undergraduates, and general public.

These programs commit to:

- Raise the quality of K-12 science education programs.
- Enlarge the pool of students who become our future scientists.
- Advance participation of groups traditionally underrepresented in science.
- Increase public interest in, and awareness of, scientific concepts and new technology.

|  |  |
|--|--|
| <b>Graduate Fellowships</b><br>   | <b>Research Experience for Undergraduates (REU)</b><br> |
| <b>Research Experiences for Teachers (RET)</b><br>                     | <b>K-12 Outreach</b><br>                               |
| <b>Partnership for Research and Education in Materials (PREM)</b><br> | <b>Outreach for High School Students</b><br>          |

MRSECs seek to advance their Education and Outreach goals through current and planned collaborations with other NSF FRC sponsored programs including: ADVANCE, CAREER, CREST, IGERT, IRI, LSHARC, MRSEC-UP, TC-UR, HSI.

Created with MRSEC input, presented at JAM and posted on MRSEC.org

# Netway Update\*

## NSF Award #0814364



- Covers the **Evaluation Planning** phase of the evaluation cycle, which includes:
  - Commitment to the project
  - Program Modeling
  - Developing the Evaluation Plan
- Purpose – develop and test the effectiveness of the SEP for evaluation of STEM programs.
- Scope – Using the SEP for Evaluation Planning.

**SEP = Systems Evaluation Protocol**

**\*Update provided by the Trochim group; based on grant report**

# MRSECs participating in Netway Project

|         |  |  |  |
|---------|--|--|--|
| 2006    | Cohort 1   | <i>CCMR</i>  |  |
| 2009    | Cohort 2<br>(fSEP)   | University of Chicago<br>University of Maryland  | Yale University (CRISP)  |
| 2010    | Cohort 3<br>(fSEP)   | <i>Pennsylvania State University</i><br>University of California, Santa Barbara<br>University of Minnesota | University of Nebraska<br>University of Washington                                 |
| 2011    | Cohort 4<br>(fSEP)   | Colorado School of the Mines<br><i>Northwestern University</i><br>The Ohio State University                | University of Massachusetts<br>University of Pennsylvania<br><i>Cornell (CCMR)</i> |
| 2012    | Cohort 5<br>(mySEP)  | Georgia Institute of Technology<br><i>Pennsylvania State University</i>                                    | Brandeis University<br><i>Northwestern University</i>                              |
| Funding | Aug 2006- July 2008 NSF #0535492, Aug 2008- July 2013 NSF #0814364 |  |  |

## Facilitated SEP: *Preliminary Findings*

- Participation is associated with **improved understanding of the program and logic** for achieving outcomes
- Participation is associated with **improved ability to discuss and promote the program**
- Participation is associated **with improved evaluation capacity**, and more efficient reiterations of SEP application.
- **Quality of the evaluation plan** is highly correlated to the quality of the program logic and pathway models
- **Managers are using SEP tools** for more than program evaluation (such as for program management, development & planning; grant writing)

# Preliminary Findings beyond project scope

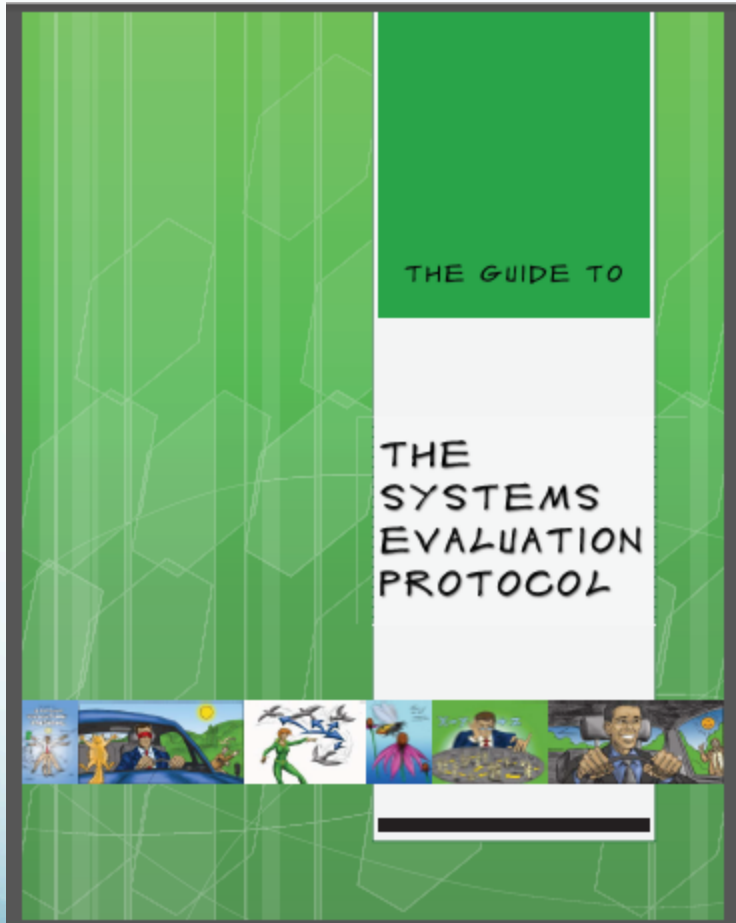
- **High levels of support and commitment from funders and organization are associated with ability to conduct quality evaluation.**
  - Lack of time is reported as a barrier to good evaluation.
  - Programs frequently don't have resources dedicated to evaluation.
  - Sustainability of quality program evaluation is a concern in general.
  - Evaluation is ideal for bridging the research-practice and practice-research gaps
- **Assistance with planning evaluation is insufficient for quality evaluation.**
  - **Training and support for evaluation implementation** was requested by most participants.
  - Additional ongoing **support may be needed for finding and developing measures, statistical analysis, and IRB issues.**
  - Refresher evaluation planning workshops and continued consultations on implementation have been requested.



# Outputs (Products)

- **Guide to the Systems Evaluation Protocol**  
Trochim, W., Urban, J., Hargraves, M., Hebbard, C., Buckley, J., Archibald, T., Johnson, M., & Burgermaster, M. (2012) The Guide to the Systems Evaluation Protocol. Ithaca, NY. Cornell Digital Print Services.
- **Golden Spike Paper**  
Urban, J. B., & Trochim, W. (2009). The Role of Evaluation in Research-Practice Integration: Working Toward the “Golden Spike”. American Journal of Evaluation, 30(4), 538-553.
- **mySEP / Netway –**  
online resources with training materials and resources built into it. Parallels the Notebooks that the fSEP participants received
- **Rubrics**  
measures based on ideas of systems evaluation to assess the quality of logic models and evaluation plans

# Guide to the Systems Evaluation Protocol



Step-by-step guide for program planning and developing program evaluation plans.

[https://core.human.cornell.edu/  
documents/SEPGuide2\\_small.pdf](https://core.human.cornell.edu/documents/SEPGuide2_small.pdf)

(please let CORE know if you download it to use it ([evaluationresearch@cornell.edu](mailto:evaluationresearch@cornell.edu)))

[https://core.human.cornell.edu/research/  
systems/protocol/index.cfm](https://core.human.cornell.edu/research/systems/protocol/index.cfm)

# What do we hope to accomplish?

## **Expected meeting outcomes:**

Participants will gain an increased knowledge of:

1. Existing and validated instruments for assessment of EO programs
2. Limitations of existing instruments
3. Methods of data analysis and implementation

## **Expected long-term outcomes:**

The MRSEC Educators Network will:

1. Establish a plan for continued cross-site evaluation efforts
2. Will start a list of useful and validated instruments to be shared with network members
3. Will initiate the development [and sharing of] resources for data analysis and reporting

# Agenda

- **8:30 – 9:00am:** Registration; Networking and continental breakfast
- **9:00 – 9:15am:** Welcome and updates
- **9:15 – 9:45am:** **Tim Weston** “An Update on the MRSEC Cross-site REU Assessment with the *Undergraduate Research Student Self Assessment Instrument*”
- **9:45 – 10:15am:** **Patricia Campbell**, Ph. D. “Making It Better: Using Research Results and NSF Frameworks to Improve the Quality and Usability of Evaluations”
- **10:15 – 10:30am:** Coffee Break and Networking
- **10:30 – 11:00am:** **Gil Noam**, Ed.D., Ph. D., “Assessment Tools of Quality STEM Programming and Engagement: New Developments”

# Agenda [continued]

- **11:00 – 11:30am: Cary Sneider**, Ph. D., “The Next Generation Science Standards and MRSEC K-12 Outreach Opportunities”
- **11:30 – 12:00pm: Kirsten Ellenbogen**, Ph.D., “Measuring the Ephemeral: Effective Evaluation of Informal STEM Learning Experiences”
- **12:00 – 1:15pm:** Lunch [committees, networking and election]
- **1:15 – 3:00pm: Robert Tai**, Ph.D. presentation and workshop
- **3:00 – 3:15pm:** Coffee Break and Networking
- **3:15 – 3:30pm:** Wrap-up, post survey and feedback

\*Presentations and other resources from this meeting will be posted at:  
<http://www.mrsec.org/events/education-directors-meeting-sept-2012>