

Advancing the STEM Agenda for Education, the Workplace and Society

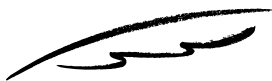


July 19-20, 2011

Sponsored By:

ASQ Education Division

University of Wisconsin-Stout



UNIVERSITY OF WISCONSIN
STOUT
WISCONSIN POLYTECHNIC UNIVERSITY



About University of Wisconsin-Stout

The University of Wisconsin-Stout, Wisconsin's Polytechnic University, enrolls more than 9,000 students in its undergraduate and graduate programs. The College of Science, Technology, Engineering and Mathematics is home to undergraduate and graduate programs in applied science, applied math and computer science, computer game design and development, information technology management, computer engineering, plastics engineering, manufacturing engineering and engineering technology and sustainable management.

UW-Stout, recipient of the Malcolm Baldrige National Quality Award, is known for its applied focus, high impact educational practices and cutting-edge, career-oriented degree programs. Nearly 90 percent of students complete an experiential learning experience prior to graduation and the graduate job placement rate has exceeded 95 percent for more than a decade. Academic programs are complemented by the UW-Stout Discovery Center, a campus-wide center involving faculty and students in applied research and technology transfer projects.

About the ASQ Education Division

The Education Division of the American Society for Quality (ASQ) promotes networking and informs its members about topics related to "quality in education," including educational leadership and reform, the *Baldrige Education Criteria for Performance Excellence*, student learning outcomes, student retention, scholarly teaching, international quality assurance, K-12 outreach and successful transition to the workplace. The division's vision is to "Shape the Future through Quality in Education and Professional Development."

The Education Division continues to grow with over 1300 members and its success was recognized with ASQ's coveted J. S. McDermond Total Quality Award this past year. The division publishes two periodicals: the open access, peer-reviewed *Quality Approaches in Higher Education* and the *Workforce Development Brief*. It also publishes *QED News*, its bi-annual newsletter.

The Education Division is a conference partner for the annual ASQ National Quality Education Conference (NQEC), is a co-sponsor of the annual STEM joint issue of the *ASQ Primary and Secondary* and *Higher Education Briefs* in celebration of engineers' week. The division also sponsored the workshop, "STEM Education: Changing the Direction," led by Division Chair, Cindy P. Veenstra and Higher Education Quality Systems Chair, Julie Furst-Bowe at the 2011 ASQ World Conference on Quality and Improvement.

Dear Conference Participants,

University of Wisconsin-Stout and ASQ Education Division welcome you to the 1st annual conference addressing STEM education. ***Advancing the STEM Agenda for Education, the Workplace and Society***, will bring to the fore the importance of a quality STEM education through the pipeline from Pre-school to Professional.

STEM students of today will be the STEM professionals of tomorrow. Success in the ventures and businesses of today and tomorrow is reliant upon the progressive, innovative and relevant STEM education this conference seeks to activate, cultivate and sustain.

The economic, social, and cultural value of the four fields of STEM – science, technology, engineering, and mathematics – cannot be understated in today’s swiftly evolving landscape. We hope you find helpful and promising the resources we have gathered for each pre-conference workshop, break-out session, and keynote address. We also hope you take advantage of opportunities to network with other professionals and educators to gain real-world knowledge about best practices and lessons learned.

We thank you for your participation and what you bring to the table by way of ideas and support to advance the STEM agenda.

Sincerely,

Your Conference Co-Chairs

July 19, 2011-Pre-Conference

see pgs. 5-6 for descriptions

1:00 p.m.-3:30 p.m. **Workshop 1**

Jarvis Hall Science Wing 142 Development and Continuous Improvement of K-12 Outreach Programs in STEM

1:00 p.m.-3:30 p.m. **Workshop 2**

Jarvis Hall Science Wing 146 Using Social Media to Support Interaction and Quality of Student Experience

1:00 p.m.-3:30 p.m. **Workshop 3**

Jarvis Hall Science Wing 150 Effective Strategies in Development Math Education

1:00 p.m.-3:30 p.m. **Workshop 4**

Jarvis Hall Science Wing 156 STEM from a Job Churning Perspective: Professions Deemed Critical for the Country's Future Well-being

4:00 p.m.-5:00 p.m. **Welcome Reception**

Jarvis Hall Science Wing Introductions:
Concourse Provost Julie Furst-Bowe
UW-Stout
Cindy Veenstra
ASQ Education Division

July 20, 2011- Conference

see pgs. 11-22 for descriptions

8:00 a.m. - 4:30 p.m. Exhibitors

Micheels Hall 184

8:00 a.m. - 9:00 a.m. Continental Breakfast

Micheels Hall 184

Poster Session

8:30 a.m. - 9:00 a.m.

Micheels Hall 184

9:00 a.m. - 9:45 a.m. **Opening Session:**

Micheels Hall 184

Welcome and Introductions

Chancellor Charles Sorensen, UW-Stout

Provost Julie Furst-Bowe, UW-Stout

Cindy Veenstra, ASQ Education Division

Opening Keynote

Michele Brinn, Vice President

Workforce Development

and Education, Greenville, SC

Chamber of Commerce

Room #:

Break out Session Tracks: Jarvis Hall Science Wing Addition 146

Track 1 Sessions: Jarvis Hall Science Wing Addition 150

Track 2 Sessions: Jarvis Hall Science Wing Addition 156

Track 3 Sessions:

Break-out Session 1

9:55 a.m. - 10:50 a.m.

Break-out Session 2

11:00 a.m. - 11:55 a.m.

Luncheon Session:

12:00 p.m. - 1:15 p.m.

Micheels Hall 184

Introductions

Provost Julie Furst-Bowe

Fernando F. Padró, ASQ Education Division

Luncheon Keynote:

Keith T. Miller

President, Virginia State University

Break-out Session 3

1:20 p.m. - 2:15 p.m.

Break-out Session 4

2:25 p.m. - 3:20 p.m.

Closing Session:

3:30 p.m. - 4:30 p.m.

Jarvis Hall Science Wing 110

Closing Keynote

Julie Furst-Bowe UW-Stout

Provost & Vice Chancellor for

Academic & Student Affairs, UW-Stout

Closing Reception

4:30 p.m. - 5:00 p.m.

Jarvis Hall Concourse Area

Other Information at a Glance

A reminder to all of our guests, UW-Stout is a tobacco free campus. Cigarettes and other tobacco products cannot be used while on campus owned or controlled property.

Internet Access

1. Open Internet Explorer and go to:
<http://net.uwstout.edu/welcome.asp>
2. Click “I Agree” at the bottom of the Page
3. Enter Username and Password
 - a. Username: STEM2011
 - b. Password: 2011STEMAgenda

(If password doesn't work, contact an Event Services Representative or dial x2000 from a campus phone)

4. Select “Register a Device” From the Left-hand navigation menu
 - a. The MAC address should appear in window (if using an unregistered computer, if not, contact an Event Services representative for assistance)
 - b. To enable the registration, the computer must be restarted (“Start” menu, “Shut Down”, “Restart”)

Program Changes and Cancellations

Changes and cancellations will be posted at the Registration Desk. The conference organizers reserve the right to make changes in programs and speakers or to cancel programs if enrollment criteria are not met, or when conditions beyond its control prevail.

Conference Proceedings

The Conference Proceedings (break-out sessions, poster papers and presentation handouts) are accessible on the conference program page:

<http://asq.org/conferences/stem-agenda/program.html>

Accreditation/ Certification Units

0.9 accreditation units will be awarded to conference participants by the University of Wisconsin-Stout. The ASQ Education Division recommends that ASQ members claim 0.9 Re-certification units (RUs) for this conference. Your conference nametag, the program cover page and the conference schedule in this program are the evidence needed to claim these RU's for your ASQ recertifications.

Transportation

Hotels to Campus Shuttle: *If you require shuttle transportation outside of these times please stop by the registration desk in Micheels Hall outside Room 184. Conference staff will do their best to accommodate any transportation requests.*

July 19:

Hotels to UW-Stout 12:00 p.m.

Hotels to UW-Stout 3:30 p.m.

UW-Stout to Hotels 5:00 p.m.

July 20:

Hotels to UW-Stout 7:45 a.m.

UW-Stout to Hotels 5:00 p.m.

Local Taxi Service:

231-TAXI : (715) 231-8294

Airport Shuttle:

Chippewa Valley Airport Service

(715) 830-9400 or (877) 811-4211

Pre-Conference Workshops

July 19, 2011, 1:00 - 3:30 p.m.

Workshop 1: Development and Continuous Improvement of K-12 Outreach Programs in STEM

Jarvis Hall Science Wing 142

Workshop Leader:

Paul D. Plotkowski

Dean of the Padnos College of Engineering and Computing
Grand Valley State University, Grand Rapids, Michigan

This workshop will engage participants in the essential elements of developing, sustaining, and continuously improving K-12 outreach programs.

Workshop 2: Using Social Media to Support Interaction and Quality of Student Experience

Jarvis Hall Science Wing 146

Workshop Leader:

Kevin W. Tharp

Assistant Professor of Information and Communications
Technology

Department of Apparel and Communications Technology
University of Wisconsin-Stout, Menomonie, Wisconsin

Tools are available to help instructors to reach out to the students in the mobile realm where many of them spend their time. This session considers the use of social media as a tool for communications and content delivery.

Pre-Conference Workshops

July 19, 2011, 1:00 - 3:30 p.m.

Workshop 3: Effective Strategies in Development Math Education

Jarvis Hall Science Wing 150

Workshop Leaders:

Deborah Kruschwitz-List

Interim Math TLC Co-Director, UW-Stout, Menomonie, Wisconsin

Kristle Mayer

Assistant Math TLC Director, UW-Stout, Menomonie, Wisconsin

This session will highlight successful and cost-effective strategies for improving student success in remedial math courses developed by the Math, Stats and Computer Science Department at the University of Wisconsin-Stout

Workshop 4: STEM from a Job Churning Perspective: Professions Deemed Critical for the Country's Future Well-being

Jarvis Hall Science Wing 156

Workshop Leader:

Fernando F. Padró

Interim Director, Educational Leadership

Cambridge College, Cambridge, Massachusetts

This workshop is a discussion of STEM from the backdrop of job churning, particularly job flow as seen in employment and wage data. This discussion should be of interest to policy makers as well as educators in K-12 and higher education.

Opening Keynote Speaker

QLS: Quality as a Second Language



Michele Brinn is Vice President of Workforce Development and Education at the Greenville (SC) Chamber of Commerce. Michele manages the chamber's workforce and education programs. Trained in mathematics education, guidance and organizational development, she taught math at the middle school and technical college level. Michele founded and directs the Carolina First Center for Excellence, providing training and services to K-12 schools and classrooms on Continuous Quality Improvement, including Baldrige principles and practices. She contributed the article, "Quality in the Classroom: Engagement, STEM and Achievement All in One" to the 2011 special issue on STEM of the ASQ Education Briefs. She has been a presenter at NQEC for several years.

Luncheon Keynote Speaker

STEM: An Entrepreneurial Approach

Dr. Keith Terrence Miller began his academic career in 1987 at Fairleigh Dickinson University's Teaneck Campus. In 1991, his last year there, he served as interim chair of the Management and Marketing Department.

Dr. Miller moved to Quinnipiac College in Hamden, CT, in 1991, where he spent three years as associate dean of the School of Business. He later became the dean of the College of Business at Niagara University.

Dr. Miller was named provost and vice chancellor of the University of Wisconsin, Oshkosh, in 2001. While serving as chief academic officer there, Dr. Miller restructured the Academic Affairs Division to focus on faculty support, learning outcomes and curricular innovation, and helped to expand the opportunities available to students to participate in research activities with university faculty. Dr. Miller is also President Emeritus of Lock Haven University of Pennsylvania.

On July 1, 2010, President Miller assumed his position as the 13th President of Virginia State University, a Historically Black College or University (HBCU) located in Chesterfield County, Virginia. Dr. Miller earned his bachelor, master's and doctoral degrees from the University of Arizona.



Closing Keynote Speaker

Lessons Learned and Next Steps



Dr. Julie A. Furst-Bowe is the Provost and Vice Chancellor for Academic and Student Affairs at the University of Wisconsin-Stout. She provides leadership to the nationally-recognized quality improvement program at UW-Stout and has served as a senior examiner for the Malcolm Baldrige National Quality Award Program. She is currently serving as higher education chair for the ASQ Education Division.

She is recognized for her expertise in quality in higher education and has authored several articles and a book on this topic, *Quality and Performance Excellence in Higher Education*. She is an editor of the International Journal of Excellence in Education.

Julie currently serves on the Executive Board for the National Consortium for Continuous Improvement in Higher Education and also the Board of Directors for the Wisconsin Center for Performance Excellence, Sacred Heart Hospital and the Stout Technology Park. She is currently under contract to provide consulting services to Singapore's Ministry of Education and Ahlia University in Bahrain.

Prior to becoming Provost at UW-Stout, Julie served as a faculty member, department chair, assessment coordinator and associate vice chancellor at UW-Stout. She holds a doctorate in education from the University of Minnesota.

Poster Presentations

Apply Failure Modes and Effects Analysis (FMEA) in STEM Curriculum Redesign

Xuedong (David) Ding, University of Wisconsin-Stout

Career Services at UW-Stout - A Collaborative and Integrative Approach

Amy Lane, University of Wisconsin-Stout

Emerging Virtual Modeling Technology to Enhance STEM Students Critical Thinking

Xuedong (David) Ding, University of Wisconsin-Stout

JETS TEAMS Competitions Builds Future Leaders in STEM Fields

David Batts and Charles Lesko, East Carolina University

Science Career Motivation and Influences

Victoria J. Fawcett-Adams, Shenandoah University

Using Regional Data Collection to Inform University Led Initiatives: The Case of a STEM Education SWOT Analysis

Jerlando F. L. Jackson and LaVar J. Charleston, Wisconsin's Equity and Inclusion Laboratory, University of Wisconsin-Madison

**Track 1:
Providing Quality and Excellence in K-12 STEM Education**

**Session 1-1:
Teacher Education and Collaboration
Improves K-12 Math and Science Learning**

9:55 a.m. to 10:50 a.m. Jarvis Hall Science Wing 146

**9:55-10:20 SySTEMically Improving Student Academic
Achievement in Mathematics and Science**

Kevin Mason, Charles Bomar and Petre Ghenciu

University of Wisconsin-Stout

Mike LeDocq and Carolyn Chapel, Western Technical College

Jerrilyn Brewer, Sparta Area School District

Jerry Redman, Redman & Associates

The study describes a collaborative project of the Western Wisconsin STEM Consortium with the University of Wisconsin-Stout, Western Technical College and nine area school districts to increase the academic achievement of students in mathematics and science by enhancing the content knowledge and pedagogical skills of classroom teachers through professional development. Participants demonstrated significant gains in mathematics and science content knowledge.

**10:25-10:50 Mathematics Placement and Student Success:
The Transition from High School to College Mathematics**

*David Boyles, Chris Frayer, Leonida Ljumanovic
and James Swenson*

University of Wisconsin-Platteville

This presentation describes the experiences of a team of mathematics instructors at the University of Wisconsin-Platteville working in collaboration with area high school mathematics teachers to reduce obstacles experienced by students in the transition from high school to college.

**Track 1:
Providing Quality and Excellence in K-12 STEM Education**

**Session 1-2:
Experiential STEM Project Learning in Middle and High Schools**

11:00 a.m. to 11:55 a.m. Jarvis Hall Science Wing 146

11:00-11:25 High Performance Math

Wendy Zinn

San Bernardino Community College District

Craig Reisgen

HiPerMath

This presentation will present the HiPerMath program designed for middle and high school students to learn math from algebra through calculus through the virtual design and operation of cars and the excitement of racing of these cars on a virtual racetrack.

11:30-11:55 FLVS Computer Science is STEMulating

Bill Jordan and Amie Ross

Florida Virtual School

This presentation will discuss the importance of teaching K-12 computer science to promote STEM education. A hands-on approach to teach Python using a robot and Java using media computing in an introductory programming course will be described. Advanced programming skills and knowledge gained from AP Computer Science will also be described. STEM related projects will be demonstrated during the presentation.

**Track 1:
Providing Quality and Excellence in K-12 STEM Education**

**Session 1-3:
Understanding the Gender Gap in STEM**

1:20 p.m. to 2:15 p.m. Jarvis Hall Science Wing 146

**1:20-1:45 Gender Stereotypes Persist in Middle School
Students Engaged in Technical Activity**

Sue Caley Opsal, Dorene Perez, Jim Gibson and Rose Marie Lynch
Illinois Valley Community College

In this K-12 research study, middle school students were surveyed and student boy/girl pairs participated in hands-on electronics activities. Researchers observed the interactions between the pairs, including the use of tools. They concluded that there needs to be more awareness of gender stereotypes and girls need to be encouraged to use tools at an early age.

**1:50-2:15 Making the Blind to See: Balancing STEM Identity
with Gender Identity**

Jennifer Skaggs
University of Kentucky

This presentation discusses the need to examine and integrate an understanding of gender within the larger societal culture for systemic and lasting change to occur in STEM education.

**Track 1:
Providing Quality and Excellence in K-12 STEM Education**

**Session 1-4:
Innovative Studies in K-12 STEM Learning**

2:25 p.m. to 3:20 p.m. Jarvis Hall Science Wing 146

**2:25-2:50 Identifying a Solar Cell Misconception Held by
Middle School Students**

*Marsha Ing, Peter Huang, Nohemi LaCombe, Yahaira Martinez
and Elaine D. Haberer*

University of California, Riverside

This research project of middle school students was designed to identify middle school students' misconceptions about solar energy and conducted activities that addressed these misconceptions. The relationship of misconceptions of scientific ideas to future studies in STEM will be discussed.

**2:55-3:20 Fab Labs: Re-envisioning Innovation and
“Entrepreneering”**

Sylvia Tiala, University of Wisconsin-Stout

This presentation discusses the innovation of “fab labs” and UW-Stout’s plans for developing a fab lab that supports the institution’s commitment to technology transfer, entrepreneurial support, and outreach to K-12 schools. Recent paradigm shifts will be discussed that support Fab labs. Fab labs have the potential for significantly supporting the STEM Agenda and fostering research in best practices for teaching/learning in STEM.

**Track 2:
Higher Education STEM: Innovative Approaches**

**Session 2-1:
Interdisciplinary Approaches Improve
STEM Instruction Design**

9:55 a.m. to 10:50 a.m. Jarvis Hall Science Wing 150

**9:55-10:20 Developmental Math Design for a Science/Math
Bridge Program: An Accelerated Approach to Basic Skill
Remediation**

Luanne E. Borowicz and Emily Baguhn

Madison Area Technical College, Madison WI

This presentation will describe an innovative Bridge program at Madison Area Technical College that pairs General Chemistry with a non-credit developmental math course and a technical reading course designed to support a chemistry curriculum. The outcomes are considered very successful and encouraging. Ninety-three percent of the students who completed the program earned a C or better in the Chemistry course and 68% of the students in this pilot study achieved an AB or higher in the math course.

**10:25-10:50 Interdisciplinary Lesson Study: Building Graph
Interpretation, Web Evaluation Skills and Enthusiasm**

Maleka Hashmi, Amanda Little and Jennifer Grant

University of Wisconsin-Stout

This presentation is focused on using instruction to increase interest in the STEM fields through an interdisciplinary non-majors biology lesson study that includes graph interpretation and critical analysis of internet information. The lesson made coursework more relevant to students, and stimulated student interest in biology.

**Track 2:
Higher Education STEM: Innovative Approaches**

**Session 2-2:
Supporting a Diverse Student Body through
STEM Learning Communities**

11:00 a.m. to 11:55 a.m. Jarvis Hall Science Wing 150

11:00-11:25 A Holistic Model for Supporting a Diverse Student Body in the STEM Field

Kitrina Carlson and Krista C. James
University of Wisconsin-Stout

This presentation describes a NSF S-STEM funded model that incorporates a holistic approach for supporting a diverse student body in the STEM fields at the University of Wisconsin-Stout. It includes a summer bridge program, faculty and peer mentors, a freshmen living-learning community, undergraduate research experiences and a scholarship program. During the time this program has been in place, the underrepresented minority population in the Applied Science program has increased from 6% to 14%.

**11:30-11:55 Mathematics in the Life Sciences:
Developing a Best Practice**

Jennifer Fellabaum, Jeni Hart and Rainer Glaser
University of Missouri

This presentation gives an overview of the University of Missouri's Mathematics in the Life Sciences learning community. It is in its 2nd year and has the potential for attracting non-STEM majors to become STEM majors. This learning community is innovative as it includes a goal to involve the local K-12 school systems in the learning community.

**Track 2:
Higher Education STEM: Innovative Approaches**

**Session 2-3:
Using Assessments in the College Classroom and to Evaluate
STEM Intervention Programs**

1:20 p.m. to 2:15 p.m. Jarvis Hall Science Wing 150

**1:20-1:45 Gender Differences in Student Responses to Physics
Conceptual Questions based on Question Content**

Laura McCullough

University of Wisconsin-Stout

In an innovative physics classroom assessment, this research studies the possible effects of the contexts in which physics questions are presented on exams. The physics classroom may serve as a barrier to women's participation when the contexts of questions and examples are stereotypically male. The results of the study indicated that the context in which physics questions are presented can have an effect on student response, and can show gender differentiation.

**1:50-2:15 Establishing Legitimacy Among STEM Intervention
Programs: The Need for Evaluation**

Casey E. George-Jackson and Blanca Rincon

University of Illinois at Urbana-Champaign

This presentation will examine the effectiveness of STEM intervention programs in conducting evaluations of their programs. STEM Intervention Programs at large, public, research universities are reviewed, including how evaluations are conducted and a summary of the results. This study will be of interest to attendees interested in implementing continuous improvement and PDSA for STEM Intervention programs.

**Track 2:
Higher Education STEM: Innovative Approaches**

**Session 2-4:
Instructional Innovations in Higher Education
Improve Quality of Education**

2:25 p.m. to 3:20 p.m. Jarvis Hall Science Wing 150

**2:25-2:50 Inspiring Non-Science Students in STEM Courses:
The Illustrated Novel Project**

Maleka Hashmi and Jennifer Grant

University of Wisconsin-Stout

Deanna Suilmann

Menomonie High School

The presentation will describe an “Illustrated Novel” project that requires each student to create a 15-20 page illustrated novel focusing on a topic within human biology. Students found the project to be beneficial, both in helping to increase their personal interest in biology and as an effective studying tool.

**2:55-3:20 Instructional Assessment Methods to Enhance
Conceptual Knowledge: A Preliminary Investigation**

Derek Wissmiller

University of Wisconsin-Stout

This study describes a pilot study to investigate the effect of alternative methods of student assessment on conceptual knowledge transfer relating to the topic of buoyancy at the University of Wisconsin-Stout. The approach could be applied in a number of classroom settings.

**Track 3:
STEM Partnerships in K-12,
the University, the Workplace and Society**

**Session 3-1:
Innovative Models for STEM Partnerships in the 21st Century**

9:55 a.m. to 10:50 a.m. Jarvis Hall Science Wing 156

9:55-10:20 Toward a New Paradigm: A Bachelor of Science Degree with a Major in Engineering Education

Kenneth Reid and Eric T. Baumgartner

Ohio Northern University

This presentation will describe a new Bachelor of Science degree with a major in engineering education at Ohio Northern University that blends the disciplines of engineering, math, science and education in the curricula. The program's graduates will be prepared to teach in middle and high schools with a strong background in engineering analysis and design. Having knowledgeable K-12 teachers who understand and communicate engineering to their students will become increasingly important.

10:25-10:50 Partnering for Success in the 21st Century

Maureen M. McMahon and Terri T. Showers

Anne Arundel County Public Schools

This presentation focuses on the development of successful K-12 STEM programs in a large suburban school district using a contemporary model that assumes interaction and engagement from all stakeholders/sectors of a community, including business and industry, higher education and community organizations.

**Track 3:
STEM Partnerships in K-12,
the University, the Workplace and Society**

**Session 3-2:
Connecting STEM Students with the Workforce
Leads to Careers**

11:00 a.m. to 11:55 a.m. Jarvis Hall Science Wing 156

**11:00-11:25 Entry of Undergraduate Engineering Students into
Work-Related Organizations and Occupational Roles**

Through a Co-op Program

Chris Plouff

Grand Valley State University

This presentation will discuss Grand Valley State University's engineering co-op program and partnership for helping students transition from their academic life to a co-op engineering position in industry, thus increasing students' preparation for transitioning to an engineering career.

**11:30-11:55 A Bio-manufacturing Enterprise for Innovative
Student Training in Quality Systems & Regulatory Compliance**

Vivian Ngan-Winward,

Salt Lake Community College

This presentation describes a student-run biotech manufacturing business enterprise established at Salt Lake Community College (SLCC), to provide students with a supportive, real-world, and contextual hands-on training environment in which they can learn and put to practice quality and regulatory concepts and skills, as well as reinforce their biotech-related STEM knowledge.

**Track 3:
STEM Partnerships in K-12,
the University, the Workplace and Society**

**Session 3-3:
K-12 Outreach Programs Change the STEM
Conversation and Improve the Pipeline**

1:20 p.m. to 2:15 p.m. Jarvis Hall Science Wing 156

**1:20-1:45 LASER: Leadership and Science Ensures Results-
A STEM Partnership between Industry and Education**

Jill Brooks, Sundown Aronsson, Elyse Hogan and Jodi Roepsch

Raytheon Corporation

Chaurcley Cook

McKinney Independent School District

This presentation will discuss the LASER project, a STEM outreach partnership between Raytheon and the McKinney Independent School District. It includes a hands-on approach that encourages creativity with the intent of engaging students to consider STEM careers. LASER has served over 1500 students. Outcome data shows that the program has been successful with an increased interest in STEM careers.

1:50-2:15 Making STEM Connections to Ignite Student Interests

Julie Hellweg and Christopher P. Cirno

University of Wisconsin-Stevens Point

This presentation will discuss outreach efforts to youth aimed at inspiring interest in and exploration of STEM careers. Two annual events are held at the University of Wisconsin-Stevens Point (UWSP) including a fall Career Day for 9th through 12th grade students and a Women & Science Day for 7th and 8th grade students. School districts have sent 1500 students to these events in the last two years.

**Track 3:
STEM Partnerships in K-12,
the University, the Workplace and Society**

**Session 3-4:
Improving Engineering Retention:
Student Beliefs and Academic Preparation**

2:25 p.m. to 3:20 p.m. Jarvis Hall Science Wing 156

2:25-2:50 Differences in Engineering Students' Beliefs across Educational Levels

Bethany A. King and Susan Magun-Jackson

University of Memphis

This presentation discusses a significant research study of students' beliefs about knowledge with the use of an epistemological questionnaire. The research results indicated differences in beliefs about knowledge as students progressed through college.

2:55-3:20 An Analysis of the Effect of Cognitive Factors on Students' Attrition in Engineering: A Literature Review

Xiushan Jiang and Stacey Freeman

University of Kansas

This presentation will explore factors that influence the high rate of attrition of engineering students through a literature review of research on the predictiveness of pre-college cognitive factors, such as the high school GPA and ACT/SAT scores, on engineering student attrition and the influence of barrier courses and college GPA on engineering student attrition.

Thank You to Our Exhibitors

ASQ Education Division

Cengage Learning

University of Wisconsin-Stout
Discovery Center

Special Thanks to Our Reviewers

Emily Baguhn	Jeni Hart
David Batts	Maleka Hashmi
Eric T. Baumgartner	Marsha Ing
Luanne E. Borowicz	Xiuhan Jiang
Jerrilyn Brewer	Bill Jordan
Jill Brooks	Bethany A. King
Elizabeth Buchanan	Charles Lesko
Kitrina Carlson	Amanda Little
Christopher P. Cirmo	Kevin Mason
Xuedong Ding	Fernando Padró
Byron Ernest	Chris Plouff
Bertram Ezenwa	Kenneth Reid
Victoria Fawcett-Adams	Amie Ross
Jennifer Fellabaum	Jennifer Skaggs
Casey E. George-Jackson	Kevin Tharp
Kenneth Getkin	Sylvia Tiala
Rainer Glaser	Wendy Zinn
Jennifer Grant	

**STEM Conference Committee Co-Chairs
and Planning Committee Members:**

Julie Furst-Bowe, **Co-Chair**

Fernando Padró, **Co-Chair**

Cindy P. Veenstra, **Co-Chair**

Jeffrey Anderson

Mary Hopkins-Best

Deanna Applehans

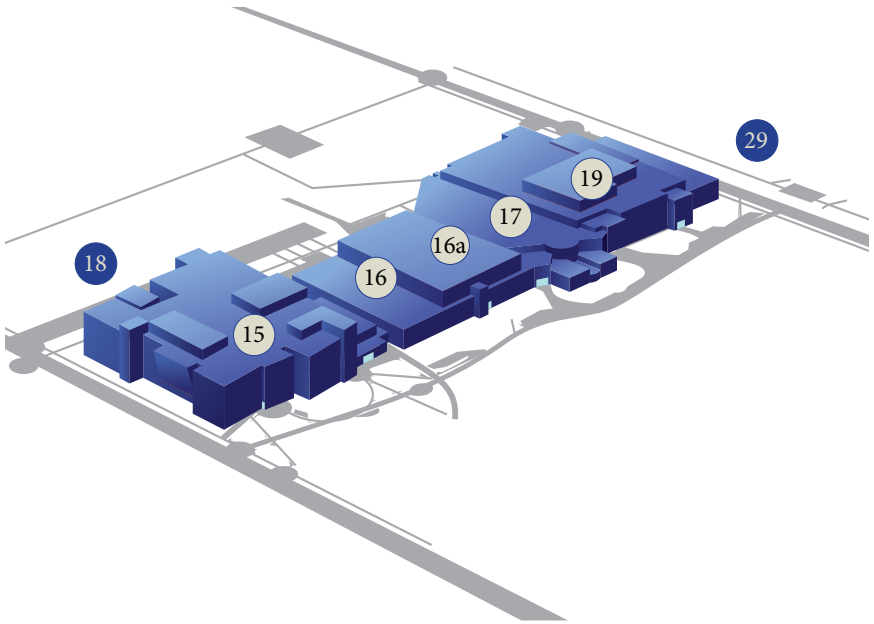
NOTES:

Thank you for coming!

Please let us know about your experience
by completing the electronic evaluation
which will be in your email.

Have a safe trip home!

Building Map



- 15 Jarvis Hall Science Wing Addition
- 16 Jarvis Hall Science Wing
- 16a Jarvis Hall Technology Wing
- 17 Micheels Hall
- 18 Parking Lot 18
- 19 Applied Arts
- 29 Parking Lot 29

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