Educating America’s Technical Workforce

High Impact Technology Exchange Conference

CONFERENCE PROGRAM

HI-TEC is sponsored by a consortium of National Science Foundation Advanced Technological Education centers and projects.

www.highimpact-tec.org

(Scan for program app.)
It is my extreme pleasure to welcome you to Denver and the 2012 High Impact Technology Exchange Conference! Although a young conference, HI-TEC is becoming the “go to” place for educators, technicians, and industry. Each year the conference expands and new sessions are added—this year is no exception. HI-TEC is a major networking event with plenty of opportunities and breaks to make it easy for you to make new connections or renew old friendships.

We hope you can take advantage of the preconference workshops and tours to the Denver Museum or National Renewable Energy Lab as well. During the conference itself you can enjoy the keynote speakers, choose from the 58 conference sessions, discuss technology and new approaches to teaching and learning at the poster sessions, and enjoy the HI-TEC Art Exhibit, new this year. The Technology Showcase has expanded this year to include many new exhibitors. Check out their products and services and be there for all the prize give-a-ways.

Use this program and the conference mobile app as your guide. Just scan the QR code on the cover to access the app. You will find a list of all the exhibitors beginning on page 52. Plan to visit the showcase and take note of the Wednesday afternoon reception at the showcase. (Remember, you must be present to win the raffle prizes.)

Thank you for participating in the 2012 HI-TEC event. You are why this conference exists—May it be a valuable and unforgettable experience. This year should be great, and please mark your calendar for HI-TEC 2013 in Austin, TX.

Deb Newberry, 2012 Chair, HI-TEC
Mid-West Center for Nanotechnology Education (Nano-Link), Rosemount, MN

Committees and Key Personnel

**HI-TEC 2012 Executive Leadership Committee**
Deb Newberry, Nano-Link, Chair
Ann Beheler, CTC
Marilyn Barger, FLATE
David Bond, CORD
Mel Cossette, MatEd
Tressa Gardner, SC ATE
Michael Lesiecki, MATEC NetWorks
Gordon Snyder, ICT Center
Sheila Wilson, CORD

**Business Committee**
Ann Beheler, CTC, Chair

**Marketing Committee**
Gordon Snyder, ICT Center, Co-chair
Lara Smith, MATEC NetWorks, Co-chair
Ann Beheler, CTC
Marilyn Barger, FLATE
Christine Dossey, OP-TEC
Bob Ehrmann, NACK

**Program Committee**
Tressa Gardner, SC ATE, Chair
Ann Blackman, CTC
Deborah Boisvert, BATEC
James Marti, Nano-Link

**Dissemination Committee**
Gordon Snyder, ICT Center, Chair

**Sponsorship Committee**
Michael Lesiecki, MATEC NetWorks, Chair

**Awards Committee**
Mel Cossette, MatEd, Chair
Marilyn Barger, FLATE
Frank Cox, MatEd
Beverly Hildebrand, CARCAM
Annette Parker, AMTEC
Ken Patton, RapidTech

**Conference Director**
David Bond, CORD

Any opinions, findings, conclusions, or recommendations expressed do not necessarily reflect the views of the National Science Foundation.
The High Impact Technology Exchange Conference (HI-TEC) is made possible by the joint effort and collaboration of many individuals across the Advanced Technological Education (ATE) spectrum. Much of the effort was accomplished by the dedicated group of volunteers recognized below. The conference is produced by the Center for Occupational Research and Development (CORD), whose skills and professionalism are outstanding. Sheila Wilson at CORD is absolutely dedicated to managing the thousands of details that make this all happen. She and her colleague Teemus Warner are a real pleasure to work with.

The HI-TEC executive committee began planning this event fourteen months ago, and many individuals contributed. I will just list the heads of the various committees and gratefully acknowledge all the work of the other committee members. Tressa Gardner did a masterful job of coordinating the conference program with a design to fit the attendees’ interests. Gordon Snyder chaired our dissemination effort including that great conference app. He also co-chaired the marketing committee with Lara Smith as our marketing effort reached out to entirely new audiences. Mel Cossette led the awards committee, which selected our winners from all the nominations. Ann Beheler on the business committee and Michael Lesiecki on sponsorship worked closely with conference director David Bond to help us manage the finances and sustain the conference effort for the future. Marilyn Barger contributed her experience as a prior conference chair and was one of our key contributors on the executive committee.

Financial support is critical to a conference’s success, and we gratefully acknowledge the support of the National Science Foundation (NSF), which shares our vision for HI-TEC. The ATE program at the NSF is one of the largest sources of financial support for innovation at community colleges across the nation. Our exhibitors in the Technology Showcase contribute their time and financial resources to help bring an awareness of their great technologies and services. The group of ATE centers and projects that acted together to produce this conference also committed financial resources to its success. Finally, our thanks go out to our attendees and presenters, who give their time, effort, and support to make HI-TEC a high-level professional development opportunity.

We would like to give a special acknowledgement to Drs. Celeste Carter and Gerhard Salinger at NSF, who have championed all of us in the ATE program. Additional thanks to Drs. Pamela Brown and John Yu, who are joining us from NSF for this event.

Welcome to HI-TEC 2012!

Deb Newberry, 2012 Chair, HI-TEC
Mid-West Center for Nanotechnology Education (Nano-Link), Rosemount, MN

Contents

General Information ........................................ 6
Schedule-at-a-Glance ................................. 7
Monday, July 23, Preconference ................. 8
Tuesday, July 24, Preconference ............... 14
Wednesday, July 25, Main Conference ....... 22
Thursday, July 26, Main Conference .......... 40
Technology Showcase ................................. 52
Index of Speakers and Presenters .......... 58
Meeting Rooms ........................... Inside back cover
Donald McCoy (IBM Corporation, retired)

Wednesday, July 25, 8:30–10:00 a.m.

Donald McCoy is an engineer, entrepreneur, and advocate for K-to-College technical education and workplace diversity. Throughout his career he has focused on helping young people discover the joy of acquiring knowledge and giving back. His work with administrators and teachers helps prepare students for the rigor of STEM professions.

McCoy’s thirty years of service to IBM included corporate headquarters assignments and a two-year international assignment to IBM England (UK). During his last ten years he focused on K-to-College STEM initiatives and diversity outreach programs and facilitated STEM workshops, technology camps, career fairs, mentoring programs, and national programs such as Black Family Technology Awareness Week and LaFamilia Technology Week.

Today McCoy is a K-to-College STEM education consultant serving on projects with the National Science Foundation, NASA, US Department of Education, NC A&T State University, North Carolina State University, and K-12 schools across the country. He serves on six STEM-focused advisory boards and committees, including the Center for Occupational Research and Development (CORD) and Wake NC State University STEM Early College High School.

Ben Robinson (former Boeing Executive)

Thursday, July 26, Noon–1:30 p.m.

Ben Robinson is the owner and president of Sentry One LLC, an aerospace industry consulting company specializing in a wide spectrum of expertise from military command and control operations to the growth and sustainment of American aerospace through investment in workforce development and leadership. Robinson is an executive-in-residence with the Oklahoma Career Technology Center system. Robinson also teaches aerospace courses at Oklahoma State University.

Prior to his current positions, Robinson was Director of Boeing Aerospace Operations in Oklahoma City. He was also the Vice President of Institutional Advancement for the Oklahoma School of Science and Mathematics. He retired from active duty with the U.S. Air Force as a Brigadier General in 2002. Robinson commanded two flying wings, two flying groups, and a space center. He was a director on the Air Staff in Washington, DC, and the Vice Commander of 8th Air Force. He held a command pilot rating with nearly 5,000 flying hours and over 250 combat missions.

In 2010 Robinson was presented with the first Life Time Achievement Award by the Oklahoma Aerospace Alliance for his contributions to the sustainment and growth of the Oklahoma aerospace industry.
Hotel Information
Denver Marriott Tech Center
4900 S. Syracuse Street
Denver, CO 80237
Main phone: 303-779-1100

Registration Hours
*Marriott Conference Center*
Sunday  4:00–7:00 p.m.
Monday  7:00 A.M.–6:00 p.m.
Tuesday  7:00 A.M.–6:00 p.m.
Wednesday  7:00 A.M.–5:00 p.m.
Thursday  8:00 A.M.–1:00 p.m.

Technology Showcase
*Rocky Mountain Event Center*
**Wednesday**
10:00 A.M.–6:00 P.M.
Reception  4:30–6:00 P.M.
Prize Drawings  10:15 A.M. • 2:45 P.M. • 5:00 P.M.

Thursday
8:00 A.M.–Noon
Prize Drawing 10:00 A.M.

Color Guard
The Mile High Honor Guard from Buckley Air Force Base will present colors at the Opening Session on Wednesday morning, 8:30–10:00 A.M. in the Evergreen Ballroom. Our thanks goes to this group for taking time out of busy schedules to do this.

To enter drawings, complete the Technology Showcase drawing card in your conference bag and drop the card at registration.
Sunday, July 22
4:00–7:00 p.m.
Registration (Conference Center Foyer)

Monday, July 23
7:00 a.m.–6:00 p.m.
Registration (Conference Center Foyer)
8:00–8:30 a.m.
Continental Breakfast (Evergreen A)
8:30 a.m.–Noon
Workshops (See page 9.)
10:00–10:30 a.m.
Refreshment Break (Evergreen Foyer)
Noon–1:00 p.m.
Lunch (Evergreen A)
1:00–4:30 p.m.
Workshops (See page 10.)
2:30–3:00 p.m.
Refreshment Break (Evergreen Foyer)

Tuesday, July 24
7:00 a.m.–6:00 p.m.
Registration (Conference Center Foyer)
8:00–8:30 a.m.
Continental Breakfast (Evergreen A)
8:30 a.m.–Noon
Workshops (See page 15.)
10:00–10:30 a.m.
Refreshment Break (Evergreen Foyer)
11:45 a.m.–5:00 p.m.
TOUR: Denver Museum of Nature and Science (Incl. lunch at the museum.)
TOUR: National Renewable Energy Lab (Incl. lunch on the bus.)
Buses load at 11:30 a.m. at the Marriott north entrance (right side facing hotel).
Noon–1:00 p.m.
Lunch on your own

Wednesday, July 25
7:00 a.m.–5:00 p.m.
Registration (Conference Center Foyer)
8:00–8:30 a.m.
Continental Breakfast (Evergreen Ballroom)
8:30–10:00 a.m.
Opening and Keynote Presentation: Donald McCoy; IBM Corporation (Evergreen Ballroom)
10:00–10:30 a.m.
Refreshment Break/View Exhibits (Rocky Mountain Event Center)
10:00 a.m.–6:00 p.m.
Technology Showcase Open (Rocky Mountain Event Center)
10:30–11:15 a.m.
Sessions (See page 24.)
11:30 a.m.–12:15 p.m.
Sessions (See page 26.)
12:15–1:30 p.m.
Awards Luncheon (Evergreen Ballroom)
1:45–2:30 p.m.
Sessions (See page 30.)
2:30–3:15 p.m.
Sessions (See page 32.)
3:00–4:30 p.m.
Technology Showcase Reception/Poster Sessions/Art Displays (Rocky Mountain Event Center)
4:30–6:00 p.m.
Technology Showcase Reception/Poster Sessions/Art Displays (Rocky Mountain Event Center)

Thursday, July 26
8:00 a.m.–1:00 p.m.
Registration (Conference Center Foyer)
8:00–8:30 a.m.
Continental Breakfast in Exhibit Hall (Rocky Mountain Event Center)
8:00 a.m.–Noon
Technology Showcase Open (Rocky Mountain Event Center)
8:30–9:45 a.m.
Sessions (See page 41.)
9:45–10:15 a.m.
Refreshment Break/View Exhibits (Rocky Mountain Event Center)
10:15–11 a.m.
Sessions (See page 43.)
11:15 a.m.–Noon
Sessions (See page 44.)
Noon–1:30 p.m.
Keynote Luncheon: Ben Robinson (Evergreen Ballroom)
1:30–2:15 p.m.
Sessions (See page 47.)
2:15–2:30 p.m.
Refreshment Break (Evergreen Foyer)
2:30–3:15 p.m.
Sessions (See page 48.)
**Monday Preconference Continental Breakfast**

8:00–8:30 A.M. Evergreen A  
(*Preconference attendees only*)
Mon, July 23

Workshops • 8:30 A.M.–Noon

Larkspur

Automating MS Office to Document Continuous Improvement Through Evaluation-Based Assessment

Attendees will learn how to make evaluation-based assessment a rewarding, value-added activity by automating MS Office and setting up an action log to document continuous improvement based on what went well, what should be improved, and lessons learned. Attendees will learn how to set up evaluation criteria. Much of this session will be devoted to teaching attendees how to write the code and make the above possible based on their own standards. Attendees should bring their own laptops.

Mark Palmer, Kettering University, Flint, MI

Evergreen E

Bridging the Gap Between Educators and Employers: The What, Why, and How of Developing a Skill Standards-Based Curriculum

Employers need workers who possess the knowledge and skills required by their industries. This hands-on workshop will provide information on and practice in developing skill standards for high-tech industries and using the standards to generate curricula that meet employer requirements. College administrators/faculty will learn about processes for forming employer groups, leading these groups in defining the skills and knowledge needed in their industries, and using the skills and knowledge as a base for developing curriculum. Participants will learn to apply the processes and integrate them into current campus curriculum activities. Technicians will learn how to use skill standards to assess their work readiness and select educational paths for enhancing these skills.

John Souders, OP-TEC, Waco, TX

Primrose

Extending Virtualization to the Classroom for Instruction and Skills-Based Competition

This hands-on workshop will demonstrate applications of virtualization in the classroom and will include an overview of popular virtualization systems available today. We will also demonstrate the CSSIA Virtualization Center and how it is being used to deliver both classroom instruction and preparation for student skills-based competitions. Each participant will be given credentials to use to experience our virtual environment. Attendees should bring their own laptops.

John Sands, Eric Spengler, Center for System Security and Information Assurance (CSSIA), Palos Hills, IL

Evergreen F

Technological Entrepreneurship Across the STEM Spectrum

This interactive, “hands-on” workshop will showcase the work of Kingsborough Community College’s Institute for Virtual Enterprise Program, an innovative pedagogy that employs active and collaborative learning to infuse principles of intra- and entrepreneurship into STEM curricula. Following an overview of the STEM Virtual Enterprise, participants will assume the roles of students and work in teams to go through the process of forming and operating a STEM-related business. We will conclude with a discussion of STEM Virtual Enterprise curriculum adoption strategies and how a National Center for STEM Entrepreneurship could help during the adoption and dissemination process.

Christoph Winkler, Edgar Troudt, CUNY Institute for Virtual Enterprise, Brooklyn, NY
Stuart Schulman, CUNY Baruch College, New York, NY

Conifer 2-3

The Art of Critical Thinking: Helping Your Students Prepare for Today’s Workplace

Today’s employees must be able to “think on their feet.” Critical thinking and problem solving have become valued commodities in the workplace. Working with six simple, low-cost hands-on activities developed to teach nanoscale concepts, the presenters will show participants how to adapt the activities to any technical program (e.g., biotech, geotech, environment, IT) to help students learn problem solving and critical thinking skills.

Deb Newberry, Kristi Jean, Billie Copley, Nano-Link Regional Center, Rosemount, MT
### Workshops • 1:00–4:30 P.M.

**Evergreen F**

**Bioscience Careers at the Interface**

Careers in bioscience require training in areas such as biomaterials, food safety, electronics, nanotechnology, manufacturing, IT, quality control, forensics, and agriculture. We seek input from others in these areas to address shared challenges; coordinate multiple education programs; and raise student awareness of the richness, diversity, and multidisciplinary nature of bioscience careers. Participants will network in a community of practice engaged in creating a shared resource for career exploration. Attendees should bring their own laptops.

- **Elaine Johnson**, Bio-Link, San Francisco, CA
- **Linnea Fletcher**, Austin Community College, Austin, TX
- **Phillip Gibson**, Gwinnett Technical College, Lawrenceville, GA
- **Jeanette Mowery**, Madison Area Technical College, Madison, WA
- **Sandra Porter**, Digital World Biology, Seattle, WA

**Larkspur**

**The Cloud and Mobile Computing**

Participants will complete several labs relating mobile computing and the cloud. Each lab will have online components as well as a detailed lab guide that will enable participants to use the lab in their classrooms. Topics will include virtualization, the latest in mobile applications, storage management, and other emerging technologies. Attendees should bring their own laptops.

- **Ann Beheler**, Convergence Technology Center (CTC), Frisco, TX
- **Ernie Friend**, Florida State College, Jacksonville, FL
- **William Saichek**, Orange Coast College, Costa Mesa, CA
- **Eliazar Martinez**, El Centro College, Dallas, TX
- **Karl Dietrich**, Lansing Community College, Lansing, MI

**Evergreen E**

**Enhancing Creativity, Innovation, and Entrepreneurship in Technician Education**

Educational processes can play an important role in encouraging creativity. The European Union (EU) has developed a unified, proactive strategy for fostering creativity, innovation, and entrepreneurship in its “vocational education and training” environment. This workshop will help attendees appreciate and implement EU best practices.

- **Jose Fernandez**, Tknika, San Sabastian, Spain
- **Marilyn Barger**, FLATE, Tampa, FL
- **Richard Gilbert**, University of South Florida, Tampa, FL

**Primrose**

**Teaching Basic Digital Logic With Field Programmable Gate Arrays (FPGA)**

This hands-on workshop will introduce field programmable gate arrays (FPGA). The first hour will cover the basics of FPGAs and the methodology of design flow. We will introduce the concept of hardware descriptive language (HDL), especially VHDL, the most commonly used. Attendees can use their own laptops. Attendees should understand basic digital logic (AND gate, OR gate, etc.).

- **Craig Kief**, University of New Mexico, Albuquerque, NM
- **Bassam Matar**, Chandler-Gilbert Community College, Phoenix, AZ
- **Karl Henry**, J. F. Drake State Technical, Huntsville, AL
Tuesday Preconference Continental Breakfast

8:00–8:30 A.M. Evergreen A

(Preconference attendees only)
Workshops • 8:30 A.M.–Noon

Primrose

Developing 21st-Century Skills Through IT Problem Solving

IT Problem Solving is an introductory course that has been implemented at the high school, community college, and university levels in the Boston area. The course makes use of industry-relevant problems to engage students and help them develop 21st-century skills and computational thinking attributes. This session will introduce the methodologies that form the foundation of the course and model processes for industry engagement aimed at increasing and verifying the development of student skills for the workplace. Attendees will participate in problem scenarios and identify opportunities to integrate them into their institutions. Attendees should bring their own laptops.

Deborah Boisvert, BATEC Center for Computing Technologies, Boston, MA
Paula Velluto, Jaime L’Heureux, Bunker Hill Community College, Boston, MA

Larkspur

Do Engineering! Engage Students Through Exciting, Hands-On Labs With LabVIEW, NI ELVIS, and Multisim

This hands-on workshop will explore the blended approach of using the National Instruments™ LabVIEW graphical programming language with computer-based USB devices such as NI ELVIS to explore modern engineering concepts through innovative experimentation. Participants will learn how LabVIEW can be used to deliver a project-based approach to teaching engineering and science and how the NI ELVIS suite of 12 integrated instruments (oscilloscope, function generator, digital multimeter, power supply, analyzers, and more) can provide a unique hands-on learning experience. Attendees will gain high-level understanding of modern industry-standard technologies and how to apply them in their curriculum.

Carl Nybro, Shas Nautilal, National Instruments, Austin, TX

Evergreen E

Lights, Camera, Action! Leveraging Online Video to Bring Your Information to the World

Online video is changing the way people learn and process information. This workshop will look at the current state of online video, offer practical advice from a panel of experts on how to incorporate online video into your day-to-day operations, and provide hands-on instruction in basic video production using tools that are easily at your disposal. The session will include production of a brief video. Attendees should bring their own laptops.

David Sweeney, ICT Center, Agawam, MA
Gordon Snyder, John Reynolds, ICT Center, Springfield, MA
Michael Qaissaunee, Brookdale Community College, Lincroft, NJ

Conifer 2-3

Shaping High-Quality Integrated Education in Nebraska

This workshop will discuss and demonstrate science, technology, engineering, and mathematics (STEM) lesson ideas and an engaging lesson design format that maps business applications of STEM concepts to curriculum “touch points.” The presentation will address the importance of contextual learning from the perspective of students, educators, and businesses. Attendees will learn the role that educational robotics and industry play in lesson development, have an opportunity to practice problem-based learning lessons, and learn how to adapt existing lessons to the classroom. Participants will receive a CD library of over 325 modular lessons.

Daniel Davidchik, Central Community College, Columbus, NE
Bob Goeman, Paul Clark, University of Nebraska, Omaha, NE
Brian Sandall, Westside Community Schools, Omaha, NE
Chad Johnson, Nebraska Public Power District, York, NE
Elissa Gilger, Aquinas High School, David City, NE
What’s in Your Genes? Let’s Find Out. Building and Interpreting a DNA Microarray

In this hands-on workshop, participants will use the SCME GeneChip Model Kit to simulate the photolithography fabrication process used to build a DNA microarray. Attendees will also interpret the results of a DNA test to determine the reliability of the microarray. This kit is available for classroom instruction at no charge.

Carrie Leopold, North Dakota State College of Science, Wahpeton, ND
Mary Jane Willis, Southwest Center for Microsystems Education (SCME), Albuquerque, NM

Tours • 11:45 A.M.–5:00 P.M.

Buses load at 11:30 A.M. at the Marriott north entrance (right side facing the hotel).

Denver Museum of Nature and Science
The Denver Museum of Nature and Science is the Rocky Mountain region’s leading resource for informal science education. A variety of exhibitions, programs, and activities help museum visitors experience the natural wonders of Colorado, earth, and the universe. Tour participants will be able to view exhibits that include gems and minerals, a space odyssey, a prehistoric journey, and wildlife exhibits, among others. A planetarium showing and an IMAX movie will both be included in this tour. Lunch at the museum is included.

National Renewable Energy Lab (NREL)
NREL is the only federal laboratory dedicated to the research, development, commercialization, and deployment of renewable energy and energy efficiency technologies. Learn about NREL’s scientific and technological efforts, performed by scientists, engineers, and analysts across our facilities, to bring renewable energy technologies from the lab to the marketplace. NREL’s distinctive R&D competencies are positioned to advance national energy goals by developing innovations that will change the way we power our homes and businesses and fuel our vehicles. Competencies include renewable electricity conversion and delivery systems, renewable fuels formulation and delivery, efficient and integrated energy systems, and strategic energy analysis. This will be a behind-the-scenes tour, with visits to experimental laboratories as well as the public areas. Lunch on the bus is included.
7:00 A.M.–5:00 P.M.
Registration Open (Conference Center Foyer)

8:00–8:30 A.M.
Continental Breakfast (Evergreen Ballroom)

8:30–10:00 A.M.
Opening and Keynote Presentation:
Donald McCoy: IBM Corporation (Evergreen Ballroom)

10:00–10:30 A.M.
Refreshment Break/View Exhibits
(Rocky Mountain Event Center)

10:00 A.M.–6:00 P.M.
Technology Showcase Open
(Rocky Mountain Event Center)

10:30–11:15 A.M.
Change Image of Manufacturing (Primrose)
STEM Academy—Elem/Middle School (Maroon Peak)
Value-Based Evaluation (Aspen Theater)
Cloud Skills: Citrix Academic Network (Larkspur)
Partnerships That Work (Conifer Ballroom)
Materials Tech Ed: Use MatEd Website (Longs Peak)
Underrepresented Populations: MPlCT (Pikes Peak)

11:30 A.M.–12:15 P.M.
Bridge the Gap Between Industry/Educ (Primrose)
Student Problems with Math (Maroon Peak)
Q R You? Market STEM Programs (Aspen Theater)
Embrazil: Engineering Education (Larkspur)
Microchips 2020 (Conifer Ballroom)
Web-Based Virtual Labs for Biomf (Longs Peak)
Grow Cohort Colleges Into Network of Leaders
(Pikes Peak)

12:15–1:30 P.M.
Awards Luncheon (Evergreen Ballroom)

1:45–2:30 P.M.
Manufacturing Careers Are Meaningful (Primrose)
College/Career Readiness in STEM (Maroon Peak)
Evaluating Tech Ed Models (Aspen Theater)
EMC Academic Alliance: Virtual Labs (Larkspur)
NSF: Funding Opportunities
for Undergrad STEM (Conifer Ballroom)
PBL to Teach Photonics (Longs Peak)

2:30–3:00 P.M.
Refreshment Break/View Exhibits
(Rocky Mountain Event Center)

3:00–4:30 P.M.
Guitar: Active Learning for
Distributive Manufacturing (Primrose)
Nano for Photovoltaic Cells (Maroon Peak)
STEM PBL in the Classroom (Aspen Theater)
Game-Based Learning: Hacking/Ethics (Larkspur)
NSF: Proposal Writing (Conifer Ballroom)
Interfacing the TI MEMS DLP Projector (Longs Peak)
ATE Resource Dissemination (Pikes Peak)

4:30–6:00 P.M.
Technology Showcase Reception
Poster Sessions
Art Displays
(Rocky Mountain Event Center)
Wednesday
Continental Breakfast
8:00–8:30 A.M. Evergreen Ballroom

Opening and Keynote
8:30–10:00 A.M. Evergreen Ballroom

The Mile High Honor Guard from Buckley Air Force Base will present colors.

Donald McCoy (K-20 STEM Education Consultant, IBM Corporation)

Technicians That Exceed Employer Expectations

It can happen—starting a career as an engineering technician and ending as a senior engineer. Today’s employers seek technicians who introduce new ways of thinking, working, and applying essential skills to a knowledge-based economy. Results-driven business leaders promote creativity, critical thinking, problem-solving, teamwork, and decision-making skills in the workplace to increase business efficiencies and collaboration. Technicians with strong project-based learning skills, inquiry-based learning skills, hands-on experiential skills, and effective communication skills can adapt to many workplace challenges and critical business needs from technical to non-technical assignments.

Donald McCoy had a long and distinguished career with IBM. Today he is a K-to-College STEM education consultant serving on projects with the National Science Foundation, NASA, US Department of Education, NC A&T State University, North Carolina State University, and K-12 schools across the country. He serves on numerous STEM-focused advisory boards and committees, including CORD and Wake NC State University STEM Early College High School.
Changing the Image of Manufacturing
This session will highlight the successful outreach activities that the Regional Center for Next Generation Manufacturing (RCNGM) has implemented. Enrollments in the manufacturing programs at colleges hosting the learning symposia/expos have doubled the semester after the expo was held. Also the new manufacturing DVD, completed in the spring of 2012, will be featured and distributed to participants. Finally, the session will provide an opportunity for participants to share their best practices for recruiting students, including underrepresented populations, into technology programs and careers.

Karen Wosczyna-Birch, RCNGM, Hartford, CT
Mehrdad Faezi, Manchester Community College, Manchester, CT

Value-Based Evaluation
Based on the Southwest Center for Microsystems Education’s (SCME) participation in the Synergy project, learning based on Wenger’s Cycles of Value Creation, and evolution from a traditional “Kirkpatrick-based evaluation” plan, this session will describe SCME’s journey towards “value-based evaluation.” Facilitators will describe the background behind their method, share some early experimentation with it, and present early results/findings. Participants will learn how to employ the method SCME uses, and how to adapt it to fit their organizations’ needs.

James Hyder, Matthias Pleil, Southwest Center for Microsystems Education (SCME), Albuquerque, NM

Teaching Cloud Skills: The Citrix Academic Network
The cloud is radically changing how the world does business and how consumers interact with technology. Organizations will need IT talent with the right skills to take advantage of the opportunities presented by the cloud. The Citrix Academic Network provides resources and an IT academy program to help students and educators build virtualization and cloud computing knowledge and hands-on skills. Attend this session to discover more about the Citrix Academic Network and how the Citrix IT Academy, which provides free server, desktop, and application virtualization courses, can provide a competitive advantage to students seeking high-paying ICT jobs.

Dan Myers, Citrix Systems, Inc., Castle Pines, CO
1E Conifer Ballroom

Partnerships That Work

Partnerships between academia and local industries represent working relationships that maximize job and career opportunities for students while providing employers a much-needed skilled workforce. Collaborations and partnerships with industries and professionals are a core mission component of Valencia’s Career and Workforce Education. Our industry partners play a major role in curriculum planning and development to help ensure students graduate with the skill sets needed by employers. In this session, we will focus on the Laser and Photonics Academy dual enrollment program partnership with Orange County Public Schools, Valencia College, and Northrop Grumman Laser Systems. Join us to learn how you can build a seamless partnership with your local industry.

Nasser Hedayat, Valencia College, Orlando, FL
Janet Addair, Orange County Public Schools, Orlando, FL
James Lipscomb, Northrop Grumman Laser Systems, Orlando, FL

1G Pikes Peak

Improve Underrepresented Population Success with MPICT’s ICT Diversity Toolkit

With one in 20 jobs requiring ICT skills and the number of black, Latino, and women students in technology education decreasing, we face a trend that has impact beyond the lack of diversity in CTE—the inability of a growing population to enter this expanding workforce. The MpiCT Center, with the support of a diversity community of practice, has built a modular toolkit for use by community college faculty, administrators, and counselors who wish to increase the participation and success of underrepresented students in their ICT courses and programs. The toolkit starts with support for making the case for taking action and then shares best practices for assessment and goal setting, recruitment and retention, and curriculum and faculty development. The presentation will include a walkthrough of content examples, highlighting websites, workshops, curriculum, conference presentations, webinars, toolkits, and events.

Olivia Herriford, Mid-Pacific ICT Center (MPICT), San Francisco, CA

1F Longs Peak

Materials Technology Education at Your Fingertips: Using the MatEd Website

The MatEd website is a rich resource of instructional materials about materials science technology. The MatEd collection includes a variety of useful information for K-12 teachers and college faculty. From core competencies to an entire textbook, curriculum, a database of materials technology modules, labs and demonstrations, links to related websites and career information, the MatEd website has something for everyone. Participants will learn how to access the features of the website for use in their courses and programs.

Frank Cox, Mel Cossette, National Resource Center for Materials Technology Education (MatEd), Lynnwood, WA
Sessions • 11:30 A.M.–12:15 P.M.

2A Primrose

ATE: Bridging the Gap Between Industry and Education
Discover successful approaches utilized by ATE centers for collaboration as well as partnership models with advanced manufacturing industries. This session will include a panel discussion regarding shared approaches to obtaining industry input in educational programs. Learn how relationships contribute to curriculum design and current relevance for the highly-skilled workforce in today’s global manufacturing environment. Topics include strategy boards, industry advisory councils, curriculum gap analysis surveys, skills assessments, incumbent worker professional development/academies, and economic development partnerships.

Moderators: Beverly Hildebrand, Consortium for Alabama Regional Center for Automotive Manufacturing (CARCAM), Gadsden, AL
Annette Parker, Automotive Manufacturing Technical Education Collaborative (AMTEC), Versailles, KY
Panelists: Don Leu, Rockwell Automation, Birmingham, AL
Michael Mann, Central Alabama Community College, Alexander City, AL
Keith Davis, Allan Maddix, Toyota North America Production Support Center, Georgetown, KY

2B Maroon Peak

Talking About Our Students’ Problems With Math
Our students often struggle with the math calculations required in their professions. Is the problem the students? Are their high school math teachers to blame? Should struggling students take remedial math classes? This presentation will explore these questions by looking for the root cause of the problem and how understanding the root cause will help us solve it.

Lisa Seidman, Jeanette Mowery, Madison Area Technical College, Madison, WI

2C Aspen Theater

QR You? Marketing Your STEM Programs to a Mobile Audience
QR codes, those funny looking dot patterns appearing at the bottom of advertisements, are the ultimate in mobile augmented reality. Are you reaching your current and potential mobile-savvy STEM students through their smart phones? Learn how an educational program, business, or non-profit can manage its online presence and blend mobility for attracting customers. The session will be of particular interest to those looking to leverage existing social network websites and mobile applications to their own use.

Edgar Troudt, CUNY, New York, NY

2D Larkspur

Embraer’s Strategy for Engineering Education: Innovation and Sustainability
The objective of this presentation is to describe two Embraer initiatives associated with education of future technicians and engineers. The participants will learn how the company, since 2004 and with the support of CORD, has prepared students coming from public schools to be enrolled in the best engineering schools in Brazil. Attendees will also learn how Embraer, since 2001 and in partnership with ITA, has prepared more than 1100 engineers to perform sustainable lifecycle design of innovative products and services, including aeronautics, structures and loads, electro-electronic systems, hydro-mechanical systems, onboard SW, manufacturing, and A/C maintenance and support.

Paulo Lourenção, Embraer S.A., Sao Jose dos Campos, Brazil

2E Conifer Ballroom

Microchips 2020
Automation has utterly changed the environment for the manufacture of semiconductor devices. The worldwide demand for microchips will continue to grow rapidly. Some industry experts predict 40 new major FABs by 2020. Explore the emerging technology and workforce trends that are envisioned to support this major industry. A video will give participants a look inside one of today’s most modern computer-chip plants where people turn silicon into the brains of computers.

Michael Lesiecki, MATEC NetWorks, Phoenix, AZ
2F  Longs Peak

Web-Based Virtual and Hybrid Laboratories for Biomanufacturing: Upstream and Downstream Processing

This session will discuss the need for and various ways of integrating web-based virtual instruments into traditional classroom online and blended learning with biomanufacturing curriculum. The presenters will demonstrate use of online virtual equipment and methods for assessing student competency. This approach addresses learning styles that include active learners, while familiarizing students with equipment, how to use it, and how to conduct online and similar hands-on experiments. A virtual chromatography lab and bioreactor will be demonstrated in detail. The integration of written instructions is aligned with the virtual tools online and is also linked with skill standards, biomanufacturing curriculum, and standard operating procedures developed by the NBC2.

Yakov Cherner, Mary Jane Kurtz, Northeast Biomanufacturing Center and Collaborative (NBC2), Blue Bell, PA

2G  Pikes Peak

How to Grow Your Cohort Colleges Into a Network of Leaders

The Mentored College program started by the Convergence Technology Center (CTC) in 2004 has evolved into a network of cohorts who are now leading other college faculty into growing new programs. This panel discussion will feature faculty from four colleges in the Convergence College Network who will describe their experiences and evolution from being mentees into becoming mentors. Participants will learn how the concepts and processes of the program could be applied to other fields where the constant changes in technology make it difficult to address curriculum updates and faculty preparedness to teach.

Ann Beheler, Convergence Technology Center (CTC), Frisco, TX
Karl Dietrich, Lansing Community College, Lansing, MI
Ernie Friend, Florida State College, Jacksonville, FL
William Saichek, Orange Coast College, Costa Mesa, CA

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**Awards Luncheon**

**12:15–1:30 P.M. Evergreen Ballroom (all attendees)**

**Educator of the Year Award**

*Recipient: Bradley Jenkins, St. Petersburg College and FLATE co-PI*

Brad Jenkins has been a faculty member and Director of Engineering Technology at St. Petersburg College for over 25 years. He is always looking for innovation in his programs and courses and has reshaped statewide technology programs. Brad is co-chair of the Florida Forum on Engineering Technology, a major vehicle for college faculty professional development.

Brad has worked closely with the Florida Department of Education on restructuring the state common course numbering prefixes for all engineering technologies. This monumental task took over two and a half years to complete and involved working through several disciplinary subcommittees and the Florida Forum for Engineering Technology. It was an important work that impacted not only our discipline but served as a model for others.

Brad has served on both SACS and TAC ABET visiting teams and the Engineering Technology Leadership Committee for ASEE. Although he holds an administrative position, Brad continues to teach at least one course each semester to help keep students in the forefront of everything he does.

Brad has served as co-PI of FLATE since 2002 and, thus, serves on the Center’s leadership team. In that role, he heads up curriculum and professional development for college faculty members throughout Florida. He also works with local and statewide industry organizations and economic and workforce development agencies to ensure alignment of academic programs with industry needs.

**Industry Recognition Award**

*Recipient: Donald McCoy, IBM Corporation*

Donald McCoy is an exceptional industry partner and national champion for the engagement and success of diverse individuals in STEM education and careers. He has devoted a lifetime to promoting technology education. Donald inspires and educates in everything he does. He holds degrees from the College of the Albemarle, a member of the North Carolina Community College System, and Old Dominion University in Norfolk, Virginia. His first job in a long and distinguished career with the IBM Corporation was in Rochester, Minnesota.

Donald’s design and manufacturing assignments with IBM took him from Rochester to England, back to Rochester, and then to the IBM facility at the Research Triangle Park (RTP), where he worked in research, hardware and software development, product assurance, and human resource development. In the final years of his 30-year career with IBM, he served as Diversity Program Manager for Multicultural People in Technology and, reporting to the office of the Vice-President, Diversity Delivery Program Manager.
Donald brought to each IBM initiative his own unique hands-on experience and understanding of how to make technology interesting and fun. He approached every assignment with boundless enthusiasm, exceptional communication skills, and deeply felt respect for the worth of every individual. He made significant contributions to a broad spectrum of IBM strategies related to diversity. Not only did he help design these activities, but he infused technology every step of the way and was personally engaged in impacting students, facilitating more than 100 engagements for K-to-college audiences and providing more than 50 camps, workshops, and presentations globally for diverse groups of young people. He has served on numerous advisory boards and has been a member of the SC ATE Center of Excellence National Visiting Committee since 2006.

**Innovative Program Award**

*Recipient: John Birch, Executive Director, Life Support and Sustainable Living Program*

The CT Life Support and Sustainable Living (LSSL) Program is an innovative and successful engineering, science, and technology program that creates teams of community college and university students who work with industry on real-world projects. Through a combination of engaging activities that integrate professional skills with real-world challenges, it is designed to attract and retain a diverse population of students including women, minorities, and veterans in Connecticut’s community colleges and state and private university engineering and technological studies programs.

The LSSL Program provides a platform for the synergistic relationship between community college and university students. Students are coached and mentored by community college and university faculty, and business and industry managers, engineers, and technicians. Student teams composed of community college and university students conduct research and develop prototypes for solving real-world problems. Students have participated in over 50 LSSL projects since 2009, including space suit design for NASA and Hamilton Sundstrand, emergency relief PODS for the U.S. Coast Guard, and developing apnea monitors for premature infants. Industry partners include Hamilton Sundstrand, Kaman Aerospace, Pratt and Whitney Aircraft, the Department of Environmental Protection, the City of Hartford, and numerous smaller industries. The projects address current and future challenges and, in the process, make the applications of engineering and technology relevant for the student. What differentiates the LSSL Program and contributes to its recognition as an innovative initiative is that it prepares students from community colleges and universities to work in teams with industry and learn critical thinking and relevant technical skills, along with professional skills such as teamwork, leadership, project planning, professional networking, and real-world entrepreneurship. The LSSL project is funded in part by a grant from the Advanced Technological Education Program at the National Science Foundation.
3A Primrose

You and Improved: A Campaign to Convey That Manufacturing Careers Are Meaningful and Relevant

The “You and Improved” campaign was piloted then implemented in high schools in technology education, CTE, and PLTW classes. The teachers were given a lesson plan with directions on how to access a landing page where students could watch a video on CAM, CAD, engineering technology, and electronics programs at Community College of Baltimore County. An app and design contest activity, used to increase participation and give access to the Fab Lab for teachers and students, will also be shared. The promotional materials, lesson plan, landing page, and results of implementing the campaign and design contest will be shared and demonstrated.

Will Anderson, Maryland Business Roundtable for Education (MBRT), Baltimore, MD
Ken Burch, TIME Center, Baltimore, MD

3B Maroon Peak

A Successful Early College Program: Collaborations to Improve College and Career Readiness in STEM

The presenters will share an example of a collaborative early college high school program grounded in STEM curriculum that improves college and career readiness. The Ballston Spa Central School District, in partnership with Hudson Valley Community College and New York State Energy and Research Development Authority, provides a rigorous early college high school program that identifies and assists at-risk students in obtaining college and career readiness skills for the high-tech fields. Representatives from the Northeast Advanced Technological Education Center will share their collaboration in developing hands-on labs for the program. Participants take away a model for success in identifying partner organizations/institutions and implementing early college programs.

Laurel Logan-King, Diane Irwin, Ballston Spa Central School District, Ballston Spa, NY
Abraham Michelen, Northeast Advanced Technological Education Center (NEATEC), Troy, NY

3C Aspen Theater

Evaluating and Validating Technology Education Modules

An overview of the rationale, processes, and outcomes of educational module validation on an NSF-funded project is described in this session. Modules focus on advanced aerospace manufacturing topics developed for postsecondary learners by a multidisciplinary team of professionals from academia and industry. Validation included modeling of competencies, development of formative evaluation protocols and methods, review/revision cycles, and development of a summative evaluation framework. A specific module and the interactions between evaluators and developers will be discussed relative to resources, processes, and short- and long-term program goals based on a logic model.

Jennifer Richardson, Purdue University, Lafayette, IN

3D Larkspur

EMC Academic Alliance and Virtual Labs With NETLAB+ by NDG

EMC Academic Alliance and Network Development Group (NDG) are developing virtual labs for the EMC Information Storage and Management (ISM) course. In this session, you learn what courses and benefits are available through the EMC Academic Alliance program and learn about the online ISM labs available through our partner, NDG.

Kim Yohannan, EMC Corporation, Franklin, MA
Rich Weeks, Network Development Group (NDG), Research Triangle Park, NC
Introduction to Funding Opportunities for Undergraduate STEM Education at the National Science Foundation

The National Science Foundation supports excellence in STEM research and education. Funding opportunities for undergraduate STEM education exist across the directorates in the agency with the Division of Undergraduate Education (DUE) in the Directorate of Education and Human Resources (EHR) as the standard-bearer. This presentation will concentrate on the programs at DUE/HER and EEC/ENG (Engineering Education and Centers in the Directorate of Engineering) with additional discussions of funding opportunities in other directorates.

Zhanjing (John) Yu, Pamela Brown, National Science Foundation (NSF), Arlington, VA

Bringing the Workplace Into the Classroom Using Problem-Based Learning to Teach Photonics

OP-TEC has recently supported the creation of workplace scenarios to compliment photonics technology curriculum used to prepare photonics technicians to solve real-world photonics workplace problems. These scenarios will be presented, along with explanation and discussion on how to best use these scenarios as a teaching tool. In addition, data will be presented on results of recent pilots of the scenarios. Session participants will also receive access to the scenarios.

Gary Beasley, Central Carolina Community College, Lillington, NC
John Souders, National Center for Optics and Photonics Education (OP-TEC), Waco, TX

Refreshment Break

2:30–3:00 P.M.
Rocky Mountain Event Center
32

Sessions • 3:00–4:30 P.M.

4A Primrose

COLLABnFAB a Guitar: Active Learning for Distributed Manufacturing

Every student likes music. Most would love to build a guitar. See how NSF projects and ATE Centers have collaborated to expand a faculty professional development workshop into a start-up, distributed manufacturing operation. Learn how you can get involved. From using the guitar as a learning tool in the classroom to becoming a supply chain partner, you can help provide dynamic, relevant, innovative STEM education.

Steve Wendel, National Center for Manufacturing Education (NCME), Dayton, OH

4B Maroon Peak

Use of Nanotechnology for Photovoltaic Cells

This presentation will review the challenges of photovoltaic cells and discuss the use of nanotechnology in the implementation of low-cost, efficient, and flexible cell. Solar energy is plentiful and clean. However, currently used photovoltaic cells suffer from high cost and inadequate absorption of sunlight. Research on photovoltaic energy and nanotechnology is overcoming these challenges. Nanotechnology in the form of quantum dots, nanorods, nanotubes, and graphene has been shown to enhance absorption of sunlight, make low-cost flexible solar panels, and increase efficiency.

Sala Qazi, SUNY Institute of Technology, Utica, NY
Abraham Michelen, Northeast Advanced Technological Education Center (NEATEC), Troy, NY

4C Aspen Theater

STEM Problem Based Learning (PBL) in the Classroom: High School and College Implementation Models

High school and college instructors will describe the implementation of STEM PBL industry-based multimedia “Challenges.” The different models include individual high school and college STEM classrooms and a collaborating team of high school and college instructors whose students worked together to solve a Challenge. Findings from instructors’ and students’ implementation surveys indicate that the Challenges increased students’ interest in STEM disciplines as well as teamwork. The team collaborations were a positive step toward increasing high school students’ aspirations for higher education and college students seeing themselves as role models.

Fenna Hanes, New England Board of Higher Education, Boston, MA
Vincent DiTaranto, Quinsigamond Community College, Worcester, MA
Deborah Lesko, South River High School, Edgewater, MD
Alexander Pancic, English High School, Boston, MA
Christine Roberson, Columbia Area Career Center, Columbia, MO
Nathan Usrey, Taft Union High School, Taft, CA

4D Larkspur

Game On: Problem-Based and Game-Based Learning in Hacking and Ethics

This session offers a look inside BHCC’s new Ethical Hacking course and an analytical conversation about its pedagogical approaches, including game, problem based, and integrated teaching. Participants will watch video clips including student interviews, play a bit of the social engineering game, and look at student communication in the blog. We will discuss what worked and what didn’t.

Jaime L’Heureux, Monica Poole, Bunker Hill Community College, Boston, MA

4E Conifer Ballroom

NSF: Proposal Writing Strategies Workshop

The objective of this workshop is to help participants develop strategies for preparing competitive proposals for undergraduate STEM education projects. Results from the analysis of reviewers’ responses to a recent survey conducted during a TUES Type 1 panel meeting identifying proposal strengths and weaknesses will be presented. Following this, a systematic process for converting an idea into a competitive Advanced Technological Education (ATE) project will be discussed. The logical presentation of ideas and plans will be presented along with the key components of a proposal.

Zhanjing (John) Yu, Pamela Brown, National Science Foundation, Arlington, VA
3:00–4:30 p.m. Sessions (continued)

**4F Longs Peak**

Interfacing the Texas Instruments MEMS DLP Pico Projector Via an Eagle Board and LabVIEW

Learn about MEMS DLP fabrication, computer control of the TI MEMS DLP pico projector, LabVIEW, and optical interference patterns. Presenters will give an overview and demonstration of creating optical interference patterns via TI MEMS DLP pico projector.

Fabian Lopez, Southwest Center for Microsystems Education (SCME), Albuquerque, NM
Michael Cranney, Andrew Huertaz, Central New Mexico Community College, Albuquerque, NM

**4G Pikes Peak**

ATE Resources for Creating a Successful Dissemination Plan to Achieve Your Broader Impact Goals

What is Twitter? Are you on Facebook? What are Google Adwords? Should we present a webinar? How do I prepare to exhibit at a conference, and where did you get your cool giveaways? Join us to learn from experienced ATE PIs and personnel about the use of ATE resources and other tools to help meet your project’s broader impact goals. ATETV showcases the best programs in the ATE Program through weekly video episodes and networks with Facebook and Twitter. ATECentral.net features a guide to using social media and connecting across the ATE community. TeachingTechnicians.org promotes faculty development among technician educators and hosts resources for new ATE PIs. MATEC NetWorks shows you how to use Google Adwords to promote your project and present webinars. FLATE prepares a monthly e-newsletter that highlights and promotes curriculum, robotics camps, and more.

Tressa Gardner, SC ATE Center of Excellence, Florence, SC
Lara Smith, Xaxiri Yamane, MATEC NetWorks, Phoenix, AZ
Marilyn Barger, Florida Advanced Technological Education Center (FLATE), Tampa, FL
Rachel Bower, ATE Central, Madison, WI
Anthony Manupelli, ATETV, Reading, MA
Jane Ostrander, Truckee Meadows Community College, Reno, NV

Developing Tomorrow’s ICT Technical Educators Today!

In the information, knowledge and innovation economies of the 21st century, individuals and organizations of all kinds increasingly depend on information and communication technologies (ICT).

The Mid-Pacific ICT (MPICT) Center is funded by the NSF ATE program to coordinate, improve and promote increasingly strategic ICT education, with an emphasis on community colleges, in northern California, southern Oregon, northern Nevada, Hawaii and the Pacific Territories.

* Championing ICT
* Developing ICT Faculty
* Building ICT Industry Bridges
* Sharing ICT Best Practices
* Expanding Diversity in ICT

* Building ICT Community
* Harmonizing ICT Curriculum
* Improving ICT Articulation & Transfer
* Sharing ICT Educator Resources
* Improving the ICT Workforce
**Iberian Student Technician Exchange Program**

This poster will present the details of a project that supported Florida student technicians in taking a capstone course for their associate degrees in San Sebastian, Spain. First, a cohort of faculty visited colleges and industry in the region and worked together with the host institution to develop the course. The second stage was the three-week student trip. The final stage is evaluation and the benchmarking of outcomes.

*Marilyn Barger, Richard Gilbert, Danielly Orozco, Florida Advanced Technological Education Center (FLATE), Tampa, FL*

**Embedding General Education Outcomes Into CTE: An Alternative Way to Increase Completers**

The College of Lake County, the Illinois Green Economy Network, and 16 partnering colleges were awarded a three-year Dept. of Labor Trade Adjustment Assistance Community College and Career Training Grant to prepare dislocated workers for high-skill, high-wage occupations.

*Allan Levandowski, College of Lake County, Grayslake, IL*

**Convergence Technology Students Reports: A Fresh Perspective on the Industry**

Student projects from four Convergence Technology Center (CTC) programs will be featured—a representation of research, case-based problem-based learning projects, and an overview of current career opportunities in information communications technology.

*Facilitators: Ann Beheler, Convergence Technology Center, Frisco, TX*

*Eliazar Martinez, El Centro College, Dallas, TX*

*David Keathly, University of North Texas, Denton, TX*

Several students will make presentations.

**STEM Problem-Based Learning Curriculum and Professional Development Project**

The poster features STEM PBL, an NSF ATE project that has developed problem-based learning (PBL) case studies called “Challenges” with a focus on sustainable technologies and provided professional development activities for STEM instructors in secondary and postsecondary institutions. The Challenges prepare students for the real world by having them work in teams to solve authentic technological workplace problems where multiple solutions are possible. The instructor facilitates and acts as consultant as students balance technology, budget, and time constraints to devise and test a solution.

*Fenna Hanes, New England Board of Higher Education, Boston, MA*

*Judith Donnelly, Three Rivers Community College, Norwich, CT*

*Nicholas Massa, Springfield Technical Community College, Springfield, MA*

*James DeLaura, Connecticut State University, New Britain, CT*

**Integrating Portable Labs Into Educational Modules**

The Advanced Aerospace Manufacturing Education Project has developed laboratories that support coursework in composites and assembly (fasteners) and that provide supplies from commercial vendors in appropriate sizes, at economical costing, as well as detailed and tested procedures.

*John Anderson, The Advanced Aerospace Manufacturing Education Project, Gardnerville, NV*
4:30–6:00 p.m. Poster Sessions (continued)

**RCNGM International Collaboration**

This poster describes collaboration between students and faculty from Connecticut’s Center for Next Generation Manufacturing and the DBHW Universities in Germany. Topics will include faculty planning, activities used to prepare the students, and the educational exchange.

Karen Woscyna-Birch, Mehrdad Faezi, Eric Flynn, Regional Center for Next Generation Manufacturing (RCNGM), Hartford, CT

**The Virtual Ideation Platform Model (VIP) Outlines Virtual Collaboration for Product Development**

The Central Maine Community College team has developed a Virtual Ideation Platform (VIP) model for online product design and development. The VIP model empowers virtual teams of community college and university faculty members and their students.

Robert Simoneau, Keene State College, Keen, NH

**Industry/Education Collaboration and Innovation**

The Regional Center for Next Generation Manufacturing (RCNGM) and the Life Support and Sustainable Living (LSSL) Program are part of the Connecticut College of Technology. RCNGM addresses the need for skilled workers in manufacturing. LSSL focuses on projects in aerospace, aeronautics, biomechanics, and engineering.

John Birch, Regional Center for Next Generation Manufacturing (RCNGM), Farmington, CT
Chuck Paulson, Regional Center for Next Generation Manufacturing (RCNGM), Waterbury, CT
Mehrdad Faezi, Regional Center for Next Generation Manufacturing (RCNGM), Manchester, CT

**NanoExperiences: Pathways to Workforce Success**

NanoExperiences will develop and evaluate an out-of-school-time (OST) program that prepares high school CTE students for postsecondary and the STEM workforce. The project has three components. NanoSurvey (spring) will introduce nanoscale science and societal implications. Nano@Work (summer) will provide mentoring and job shadowing. In NanoSymposium (fall) students share their reflections and plans of study and career pathways.

Sharon Unkart, John Ristvey, Anne Tweed, McREL (Mid-continent Research for Education and Learning), Denver, CO

**Protein Is Cash: Introductory Curriculum Developed for Education in Biomanufacturing, Grades 8–14**

NBC2 has created a professional development workshop, “Protein Is Cash” (PIC), that provides teachers with hands-on activities and information for advanced biomanufacturing career paths that can be incorporated into the science classroom.

Mary Jane Kurtz, Northeast Biomanufacturing Center and Collaborative (NBC2), Blue Bell, PA

**Preparing a New Workforce for a Sustainable Economy**

Preparing a New Workforce for a Sustainable Economy is an ATE project that produces model certificate programs in renewable energy leading to a new two-year degree at Illinois Valley Community College. An associate in applied science degree in industrial/engineering technology, nearly complete, will provide a career pathway from renewable energy and related certificates to baccalaureate programs. This poster highlights the process and aggressive timeline for developing this degree. The poster also focuses on the two wind energy certificate programs.

Jim Gibson, Jamie Gahm, Sue Isermann, Rose Marie Lynch, Illinois Valley Community College, Oglesby, IL

**SCME Mapping Project; Micro/Nano Technicians—Where Will the Jobs Be?**

The SCME Industry Mapping project is an ongoing effort of SCME to identify micro/nanotechnology industry clusters and associated community colleges and projected technician hiring needs. Using GIS software, input from education, industry, and government, and a comprehensive industry survey, SCME will present a map that overlays microsystems industries with the nation’s community colleges. Included in the analysis are projections of industry technician hiring and where the key target growth clusters are. SCME is using this tool set to identify and reach out to areas in the country that can benefit from having a microsystems technician program.

Matthias Pleil, Southwest Center for Microsystems Education (SCME), Albuquerque, NM
**THURSDAY • JULY 26**

**8:00 A.M.—1:00 P.M.**
Registration Open (Conference Center Foyer)

**8:00–8:30 A.M.**
Continental Breakfast in Exhibit Hall
(Rocky Mountain Event Center)

**8:00 A.M.—Noon**
Technology Showcase Open
(Rocky Mountain Event Center)

**8:30–9:45 A.M.**
Tech Ed: PBL Challenge (Primrose)
Introduce Nano in Your Program (Maroon Peak)
Women in Energy (Aspen Theater)
Elements for ATE Bridge Program (Larkspur)
NSF Forum: Skills Prep for Technical Professionals
(Conifer Ballroom)
Tech Programs Impact Economic Dev. (Pikes Peak)

**9:45–10:15 A.M.**
Refreshment Break/View Exhibits
(Rocky Mountain Event Center)

**10:15–11:00 A.M.**
Integrate Math, Science + Career Ed (Primrose)
Physics of Green Energy (Maroon Peak)
Principles for Collecting Information (Aspen Theater)
AT&T Technicians: Building Wireless Networks (Larkspur)
NSF: Best Practices for ATE Projects (Conifer Ballroom)
Tech Entrepreneur Across STEM Spectrum (Longs Peak)
Space Technology Principles & Apps (Pikes Peak)

**11:15 A.M.—Noon**
Nano Ed Resources for Community Colleges
(Primrose)
Chemistry + Engineering + Literacy (Maroon Peak)
Good Times for ICT in Bad Times (Larkspur)
Ending Mfg Processes With a Bang (Conifer Ballroom)
Partnerships to Meet Industry Needs (Longs Peak)
Social Media in Safe Setting (Pikes Peak)

**Noon—1:30 P.M.**
Keynote Luncheon: Ben Robinson
(Evergreen Ballroom)

**1:30–2:15 P.M.**
Build Enrollment in Tech. Online Programs (Primrose)
Wind Technology Curriculum (Maroon Peak)
Teaching Nano in High School (Aspen Theater)
Hackers/Security (Larkspur)
Welding Professional Development (Conifer Ballroom)
Transfer of CC Engineering Students (Longs Peak)

**2:15–2:30 P.M.**
Refreshment Break (Evergreen Foyer)

**2:30–3:15 P.M.**
Vacuum Training Equipment (Primrose)
Developing Tech Programs in Arkansas (Maroon Peak)
Embed General Education in CTE (Aspen Theater)
Develop Interactive STEM Curriculum (Larkspur)
Infuse Soft Skills Using PBL (Conifer Ballroom)
Teach IPv6 (Longs Peak)
Continental Breakfast

8:00–8:30 A.M. Evergreen Ballroom

Scan the QR code on the table tent at your table to complete the conference evaluation.

Sessions • 8:30–9:45 A.M.

5A Primrose

Active Learning in Technician Education: The Problem-Based Learning (PBL) Challenges

Have you considered using problem-based learning (PBL) in your classroom but were uncertain how to begin? In this session you will work through an abbreviated PBL challenge from the PBL projects of the New England Board of Higher Education. Guided by the built-in problem solving resources for students, you will develop a solution to a real-world industry-based problem. We will also demonstrate the teacher resources included in each of the web-based multimedia challenges, technical information, assessment strategies, implementation stories, and standards alignment. You will leave the session with everything you need to begin PBL.

Judith Donnelly, Three Rivers Community College, Norwich, CT
Nicholas Massa, Springfield Technical Community College, Springfield, MA
James DeLaura, Central Connecticut State University, New Britain, CT
Joseph Amarante, Elizabeth Chatis, Central Connecticut State University, New Britain, CT

5B Maroon Peak

Ways of Introducing Nanotechnology Into Your Program

The demand for people with nanotechnology-related skills is on the rise and one estimate puts this need for nano-literate workers at approximately 2 million by 2020. To fulfill these current and future needs, it is imperative that educational institutions across the country tackle this nano-awareness challenge. This session is designed for educators who are (or would like to be) incorporating nanotechnology into their coursework or into programs at their educational institutions. Attendees will learn about many of the resources (websites, videos, experiments, learning modules, full courses) as well as professional development opportunities that are available to them for integration into their classrooms and programs.

Robert Ehrmann, National Center for Nanotechnology Applications and Career Knowledge (NACK), University Park, PA
Xaxiri Yamane, MATEC, Phoenix, AZ
Osama Awadelkarim, Penn State University, University Park, PA

5C Aspen Theater

Priming the Pipeline: Strategies for Recruiting and Retaining Women in Energy Technology Fields

Come learn about strategies and tools for improving the recruiting practices and retention methods for women and underrepresented minorities.

Lawrence Beaty, Idaho State University, Pocatello, ID
Richard Holman, Idaho National Laboratory, Idaho Falls, ID
Chris Guthrie, Partners for Prosperity, Blackfoot, ID
8:30–9:45 A.M. Sessions (continued)

5D Larkspur

Essential Elements for Advanced Technological Education Bridge Programs

Bridge programs offer the potential to meet community college ATE program goals of equity, access, and retention. Based on the research of three ATE Bridge Programs, this presentation will discuss seven separate but related crucial elements including cohort, contextual basic skills, integrated content and assignments, learning community, authentic assessment, substantive professional development, and community of practice for faculty and students. Researchers and community college practitioners will offer a theoretic framework and practical considerations for the implementation of Bridge Programs. Students’ views of Bridge Programs will also be offered.

Norena Badway, San Francisco State University, Stockton, CA
Andrea Goldfien, San Francisco State University, Novato, CA
Armineh Noravian, San Francisco State University, Cupertino, CA
Angela Wall, Wayne Community College, Goldsboro, NC

5F Pikes Peak

Measuring Up: How Technical Programs Impact Economic Development

Accountability is everything. How can we define and measure the economic impact of ATE programs on colleges, communities, companies, and the country? This panel convenes education, government, and industry leaders who will provide a snapshot of how ATE programs have contributed to the economic development of their respective regions. Panelists will be asked to respond to challenges and questions presented by both the moderators and the audience. Please join this panel and hear about how ATE programs are making an impact while sharing your own ideas and experiences.

Moderators: Marilyn Barger, FLATE, Tampa, FL
Karen Wosczyna-Birch, Regional Center for Next Generation Manufacturing (RCNGM), Hartford, CT
Panelists: Chuck Bates, General Dynamics Armament and Technical Products, Saco, ME
Diane Dostie, Central Maine Community College, Auburn, ME
Carol Shatley, GE Global Research Center, Schenectady, NY
Abraham Michelen, Northeast Advanced Technological Education Center (NEATEC), Troy, NY

Refreshment Break

View Exhibits

9:45–10:15 A.M.
Rocky Mountain Event Center
**THURSDAY • JULY 26**

**Sessions • 10:15–11:00 A.M.**

**6A Primrose**


WhyPower consists of a program and a curriculum funded in part by the Texas Governor's Office and the EDUCAUSE Foundation's Next Generation Learning Challenges initiative. Using Whyville, the learning-based virtual world for teens and tweens, WhyPower delivers integrated math, science, and career education to middle and early high school students. It integrates career pathways for local college programs into game activities. Join us for a hands-on session and help us determine how to interface with the ATE community.

**Cliff Zintgraff**, DaVinci Minds, San Antonio, TX

**Linnea Fletcher**, Austin Community College, Austin, TX

**6B Maroon Peak**


Do you need to pique the interest of students in a physics class? Don't know much about renewable energy, yet you want to introduce it into an existing course? Whether you are interested in developing a new course or adding “renewable energy” to an existing one, come see how I implemented Green Energy into a new physics lab science course. Hands-on components for teaching solar, wind, and fuel cell technology will be showcased. An overview of how to develop/use green energy in a lower-level science lab-based course will be discussed.

**Barbara Washburn**, Springfield Technical Community College, Springfield, MA

**6C Aspen Theater**

**It's All About Measurement—The Principles for Collection of Information**

No matter what you are doing—coaching a soccer team, organizing a fund raiser, or directing a technical project—you need to know how you are doing and what your customer is thinking. This session will provide an array of measurement methods that are applicable in many different situations. Consider broad versus narrow, behavioral versus attitudinal, and reactive versus non-reactive measurements. By selecting the appropriate measurement methods you can get the most useful information—measurements that you can actually use. Hone your measurement skills or learn some new ones.

**Jim Dearing**, Institute for Health Research/Kaiser Permanente, Denver, CO

**Deb Newberry**, Mid-West Center for Nanotechnology Education (Nano-Link), Rosemount, MN

**6D Larkspur**

**What an AT&T Technician Needs to Know About Deploying LTE Wireless Networks**

Wireless operators worldwide are deploying LTE to provide their customers with the best possible mobile broadband experience. This session will explore what changes will need to take place in the macro and in-building networks and what a cell technician will need to know to accommodate this new technology.

**Paula Doublin**, AT&T Services, Inc., Farmers Branch, TX

**6E Conifer Ballroom**

**NSF Discussion: Best Practices for ATE Projects**

This session will discuss best practices in areas covered by the NSF Advanced Technological Education (ATE) program. This will include program development and improvement, curriculum and educational materials development, professional development for educators, leadership capacity building for faculty, teacher preparation (for K-12 teachers; project must involve both two-year and four-year institutions), and business and entrepreneurial skills development for students. In addition, panelists will also discuss two important issues associated with technician education programs: outreach and student recruitment and articulation between two-year and four-year colleges.

**Pamela Brown**, Zhanjing (John) Yu, National Science Foundation (NSF), Arlington, VA
10:15–11:00 a.m. Sessions (continued)

6F  Longs Peak

Technological Entrepreneurship Across the STEM Spectrum
This interactive and “hands-on” session will showcase the work of Kingsborough Community College’s Institute for Virtual Enterprise Program, an innovative pedagogy that employs active and collaborative learning to infuse principles of intra- and entrepreneurship into STEM curricula. Following a general overview of the STEM Virtual Enterprise, participants will assume the roles of students and work in teams to go through the process of forming and operating a STEM-related business. The workshop will conclude with a discussion about various STEM Virtual Enterprise curriculum adoption strategies and how a National Center for STEM Entrepreneurship could help them during the adoption and dissemination process.

Christoph Winkler, Edgar Troudt, CUNY Institute for Virtual Enterprise, Brooklyn, NY
Stuart Schulman, Baruch College, New York, NY

6G  Pikes Peak

Space Technology Principles and Applications
The presenter will demonstrate the basic principles of space technologies and explain their applications in areas such as education, agriculture, and the environment. Use of robotic technology in its role in information collection and dissemination will also be discussed. Space technologies have a lot to offer and their integration into college-level curricula would help students to become familiar with these ever-advancing technologies and their ever-widening applications in many areas.

Mohammad Razani, New York City College of Technology, Brooklyn, NY

Canceled

Sessions • 11:15 a.m.–Noon

7A  Primrose

Nanotechnology Education Resources and Materials for Community Colleges
The importance of teaching nanotechnology and how it relates to STEM education in general will be discussed. Short videos on the current applications of nanotechnology in cancer treatment, water purification, and biomimicry will be shown. Examples of free 2D and 3D videos and links with hands-on activities will be provided. The establishment of classes and class sections to aid in the dissemination of new and evolving technology in classrooms at a variety of educational levels will also be presented. We will also discuss how nanotechnology classes have helped to improve student diversity.

Douglas Buckley, UMass, Springfield, MA

7B  Maroon Peak

Chemistry (redox), Engineering, and Literacy Through Dye-Sensitized Solar Cells
This session will present a model for teaching oxidation/reduction chemistry at the high school level using dye-sensitized solar cells. Students will research and build a solar cell using fruit juice nano-crystalline TiO2. Participants will see how common core literacy, engineering concepts (redundant systems and FMEA), and chemistry are combined in an engaging, student-centered project. The project-based learning model also facilitates learning 21st-century skills (project management, critical thinking, and communication). Ideas for integrating local businesses with the project and interactions with students will also be discussed. Participants will receive rubrics, lessons, and materials for one solar cell.

Diana Weldon, Tech Valley High School, Rensselaer, NY
**11:15 A.M.–Noon Sessions (continued)**

**7C Larkspur**

Good Times for ICT and ICT Education, Even in These Bad Times

Even though times are tough for many in the “Great Recession,” information and communication technologies (ICT) are still advancing rapidly, and there are still great opportunities for ICT education and employment. Employers are having trouble finding appropriately skilled ICT workers, even in this period of high unemployment. Learn what labor market studies report about ICT and ICT employment (one in 20 jobs already) and how we can improve public ICT education to meet ICT workforce demand.

**James Jones**, Mid-Pacific ICT Center (MPICT), San Francisco, CA

**7D Conifer Ballroom**

Ending Manufacturing Processes With a Bang: Design, Application, and Innovation

The results of ending a survey course in manufacturing processes with cost analysis, work design, the design process, and innovation will be discussed. The modules and how the students are exposed to the subject matter throughout the course will be presented along with how this enables higher-level learning. A typical class session will be presented, showing an elevation in learning achieved through interactive learning with a major online component. The design of the website that enables the online learning to take place will also be discussed.

**Mark Palmer**, Kettering University, Flint, MI

**7E Longs Peak**

A University and Community College Partnership to Meet Industry Needs for Future Advanced Automotive Technology Workers

The auto industry is undergoing a technological transformation to electrification and other advanced technologies that is fundamentally changing educational requirements for the industry’s workforce. Learn about how Macomb Community College and Wayne State University have partnered to respond to these changing needs by strengthening communications with industry to clearly define future workforce requirements, by developing technologically progressive curricula, and by gathering and disseminating current, innovative educational materials to a broad network of national institutions.

**Joseph Petrosky**, Macomb Community College, Warren, MI

**7F Pikes Peak**

Practicing Social Media in a Safe Setting

Bio-Link has been using diverse forms of social media to connect with students, industry partners, and other programs. We will present data describing the results of these efforts and show examples of ways social media can be employed. Participants will have an opportunity to test diverse forms of social media themselves as we demonstrate the power of these new tools.

**Sandra Porter**, Digital World Biology, Seattle, WA

**Linnea Fletcher**, Austin Community College, Austin, TX
Keynote Luncheon  
Noon–1:30 p.m. Evergreen Ballroom

Scan the QR code on the table tent at your table to complete the conference evaluation.

**Ben Robinson (former Boeing Executive)**

*What I Believe About America’s Best Resource*

America needs a well educated, trained and motivated workforce to meet the challenges of emerging technologies and a global market. Our future workforce is in today’s classrooms and we must engage those students if we are to create the workforce our future demands. While the world has changed, many of our educational methods and means have not. Just addressing graduation requirements falls short of awakening students’ interests in a career path. Connecting educational requirements through career pathways and occupational relevance is the course we are on in the Oklahoma aerospace industry. For us it is about a partnership between the educators and the employers. I will share what we are doing in Oklahoma and hope to create a dialogue about best practices that spark innovation and creativity in our most precious resource, our young people.

Ben Robinson owns and directs an aerospace industry consulting company, is an executive-in-residence with the Oklahoma Career Technology Center system, and teaches aerospace courses at Oklahoma State University. He served in the U.S. Air Force for more than thirty years, retiring as a Brigadier General in 2002, and was the first recipient of the Life Time Achievement Award by the Oklahoma Aerospace Alliance.
Sessions • 1:30–2:15 p.m.

8A Primrose

Strategies for Building Enrollment in Technical Online and Blended Programs Offered Through a Consortium Model

This session will cover identified strategies for building enrollment in online and blended technical programs in advanced manufacturing technology. Barriers, issues, best practices, and lessons learned will be shared by a team working to improve enrollments in the eTECH certificates. Strategies covered will include defining program metrics and the financial model for consortium programs, emarketing strategies, the use of the customer relationship management (CRM) system, and communication with consortium members.

Karen White, Bemidji State University, Bemidji, MN

8B Maroon Peak

Wind Technology Curriculum: From DACUM to Development

One of the challenges of developing a technician program is navigating the needs of employers and the curriculum process. Learn how to leverage NSF ATE centers to utilize experts in their fields to develop curriculum. Tools developed from the DACUM through Development will be provided. We will discuss leveraging NSF resources (visiting model schools, faculty knowledge exchange and resources) and navigating processes. Participants will be provided with hands-on resources.

Valerie Karnes, Suzanne Ama, Adnan Buxamusa, Cerro Coso Community College, Ridgecrest, CA

8C Aspen Theater

NanoTeach: Effectively Teaching Nanoscience and Technology in High School

Learn how to plan instruction that reveals what students know about nanoscience and technology content and how you can help them develop understanding of these hard-to-teach concepts. We will provide a planning template and sample lessons. The strategies used come from a framework that forms the basis of designing effective science instruction.

Sandra Weeks, McREL, Denver, CO

8D Larkspur

Whitewater Vigilante: Helping Vulnerable Organizations

Outlaw hackers often dump lists of vulnerable websites on Pastebin and other public repositories. Many organizations are unaware of their security problems, and also unaware that they are now publicly exposed. And in many cases, the organizations at risk are high-level government sites or law enforcement agencies, entrusted with confidential data that could do great harm if it is exposed. My security students and I have been contacting these organizations and helping them to fix their security problems. We recommend this as a good service-learning project for other classes.

Sam Bowne, City College San Francisco, San Francisco, CA

8E Conifer Ballroom

Professional Development Training for Welding Educators

This session will provide an overview of the methodology and process used for the creation of professional development modules for welding educators.

Duncan Estep, Weld-Ed Center, Elyria, OH

8F Longs Peak

Simplifying the Transfer of Community College Engineering Students to the University

Four years ago a small group of community colleges and a university in Maryland sought a standardized solution to the complexities of transferring from two- to four-year institutions. This has led to the associate of science in engineering (ASE) degree, which streamlines the transfer process. This has opened many avenues of communication and has increased understanding and agreement. Though not without challenges, it has proved to be a major advantage to our students. The presenter has been a part of this process since the beginning and will share the goals, methodology, results, challenges, and vision for the future.

Frank Lanzer, Marjorie Rawhouser, Anne Arundel Community College, Arnold, MD
The Evolution of Vacuum Training Equipment in Response to the Needs of Technology Education

Vacuum technology is at the heart of many advanced manufacturing processes, but historically it has been treated as a background technology. Over the past few decades a number of formal curricula have been developed to teach vacuum as a subject. Partnerships between colleges and industry have resulted in the development of vacuum training tools and instructional materials. There has been a corresponding progression from vacuum physics to instrumentation to table-top processing. This presentation covers the evolution of vacuum teaching equipment, concluding with a discussion of the vacuum and small-scale thin film processing labs at Mohawk Valley Community College.

Stephen Hansen, DiverseArts, LLC, Owls Head, ME
Robert Decker, Mohawk Valley Community College, Utica, NY

Embedding General Education Outcomes into CTE Programs: An Alternative Way to Increase Completers

Recently President Obama challenged community colleges to increase associate degree completers. However, with community colleges operating at capacity and most career students reluctant to venture into the realm of academia, this can be a daunting task. The College of Lake County, the Illinois Green Economy Network, and 16 partnering colleges, were awarded a three-year Department of Labor Trade Adjustment Assistance Community College and Career Training Grant to teach dislocated workers the knowledge and skills necessary for employment in high-skill, high-wage occupations. One initiative for this grant is to accelerate completion time by embedding general education outcomes into CTE programs.

Allan Levandowski, College of Lake County, Grayslake, IL

Developing Technical Programs: A Multi-Case Study of Community Colleges in Arkansas

This session will present findings from a research study that examines how differences in the environmental conditions and organizational factors facing community colleges contribute to the development of occupational and technical education programs. To answer the research questions, a qualitative study of four community colleges in the state of Arkansas was conducted.

Duane Doyle, Jack Osier, Arkansas State University, Newport, AR

Cultivating Innovators and Big Thinkers: A Lesson Model for Developing Interactive STEM Curriculum

This workshop will discuss and demonstrate a uniquely engaging lesson design format that maps business applications of science, technology, engineering, and mathematics (STEM) concepts to curriculum “touch points.” Attendees will participate in a series of thought-provoking activities used to examine and conceptualize interactive lessons for secondary and postsecondary students following the AEIOU format—Asking questions,
2:30–3:15 p.m. Sessions (continued)

Exploring concepts, Instructing, Organizing learning, and Understanding. You will learn the role that educational robotics and industry play in lesson development and have an opportunity to explore problem-based learning lesson development techniques. Participants will receive a CD library with over 325 completed lessons.

Daniel Davidchik, Central Community College, Columbus, NE
Bob Goeman, Paul Clark, University of Nebraska, Omaha, NE
Brian Sandall, Westside Community Schools, Omaha, NE
Chad Johnson, Nebraska Public Power District, York, NE
Elissa Gilger, Aquinas High School, David City, NE

9F Longs Peak

Are You Ready to Teach IPv6?

By 2012, the IPv4 address pool was exhausted. With no further IPv4 addresses available, the solution is IPv6. IPv6 has 128-bit addresses that will last well into the foreseeable future. IPv6 also includes significant enhancements such as security, quality of service, mobility, and improved performance. We will have to implement IPv6 on all our routers, servers, applications, and end devices. There is no choice since there are no more IPv4 address pools available. In this session, attendees will learn the basic concepts of IPv6 and can start using it in their classrooms immediately with hands-on projects using free IPv6 tunnels.

William Saichek, Orange Coast College, Costa Mesa, CA
Karl Dietrich, Lansing Community College, Lansing, MI

9E Conifer Ballroom

Infuse Soft Skills Into a Technical Course Using Project-Based Learning (PBL)

IT recruiters are looking for new hires who demonstrate a broad range of soft skills in addition to the required technical abilities. This session will demonstrate how to integrate an ongoing or capstone PBL soft skills project, based on Microsoft Office applications, into STEM courses, resulting in increased student employability. Through your students’ individual initiative and teamwork efforts, small teams will complete a multifaceted project and present the results to the entire class and representatives from the respective industry for grading and feedback. The outcome is increased soft skills, written/verbal communication, teamwork/collaboration, self-management/motivation, critical thinking, and problem solving.

Rex Parr, Aims Community College, Greeley, CO
Please visit our exhibitors in the Rocky Mountain Events Center on the Main Level. Exhibits are open on Wednesday, July 25, 10:00 a.m. to 6:00 p.m. (with an Exhibitor Reception 4:30 to 6:00 p.m.) and Thursday, July 26, 8:00 a.m. to noon. This year we’ve included an art display of high-technology photos. Enjoy!

301
American Technical Publishers
10100 Orland Parkway, Suite 200
Orland Park, IL 60467
www.go2atp.com
ATP publishes print and electronic applied postsecondary content with leading programs in the electrical, maintenance, welding, and construction trades.

316
AMTEC: Automotive Manufacturing Technical Education Collaborative
300 North Main Street
Versailles, KY 40383
www.autoworkforce.org
Automotive Manufacturing Technical Education Collaborative (AMTEC) is a collaboration of community and technical colleges and industry partners who seek to better prepare highly skilled technicians and manufacturing engineers for work in automobile manufacturing and technology.

202
Armfield Inc.
436 West Commodore Boulevard, Suite 2
Jackson, NJ 08527
www.discoverarmfield.com
Manufacturer of laboratory teaching equipment for engineering and technology. Products cover a wide range of disciplines including process control, refrigeration, air conditioning, water treatment, biochemical and unit operations.

313
ATE Central: Advanced Technological Education Central
1210 West Dayton Street
Madison, WI 53705
http://atecentral.net
ATE Central provides tools, services, and materials that amplify the efforts of the ATE community and connect STEM educators with valuable digital resources and technology.

215
Bio-Link
City Colleges of San Francisco
1855 Folsom Street, Suite 643
San Francisco, CA 94103
www.bio-link.org
A National Center of Excellence designed to meet the rapidly changing needs of biotechnology and related life science industries and prospective technical workforce, Bio-Link is able to provide the much wider range of services and products now needed by the swiftly changing biotech industry.

317
CARCAM: Consortium for Alabama Regional Center for Automotive Manufacturing
P0 Box 227
Gadsden, AL 35902
www.caracam.org
Consortium for Alabama Regional Center for Automotive Manufacturing (CARCAM) provides a system to educate a highly-skilled employee pipeline for the automotive and advanced manufacturing industries. Funded by the National Science Foundation (NSF), CARCAM updates and develops relevant curriculum for industry needs, provides professional development, and creates student career pathway options.
This program utilizes equipment and software that is standard in today's industries. It provides students with not only the basics, but also the advanced knowledge and troubleshooting skills needed to have the competitive edge in today's job market. This innovative program is designed as an advanced industrial automation and pre-engineering program ideal for secondary and postsecondary schools.

308
EMC Corporation
55 Constitution Boulevard
Franklin, MA 02038
www.emc.com
EMC Corporation is a global leader in enabling businesses and service providers to transform their operations and deliver information technology as a service.

108
ETA International
5 Depot Street
Greencastle, IN 46135
www.eta-i.org
ETA® International is a worldwide, not-for-profit certification organization founded in 1978. Among the 80+ certifications ETA has to offer are basic electronics, industrial electronics, customer service, information technologies, wireless communications, and fiber optics.

404
ExOne
127 Industry Boulevard
North Huntington, PA 15642
www.exone.com
The ExOne Company supplies services, systems and solutions for additive manufacturing using three-dimensional printing (3DP) in metal, glass and sand. The 3DP process builds an object, or mold for an object, layer by layer out of powdered material, a chemical binder and a digital file. Industrial-strength materials are used to create prototypes and short-run production parts. 3DP provides design flexibility and significant time savings over traditional manufacturing methods.

204
ICT Center: Information and Communications Technologies Center
One Armory Square, Suite 1
Springfield, MA 01102
www.ictcenter.org
The ICT Center is preparing students and technicians for the Information and Communications Technologies (ICT) industry where unified communications and rapidly changing ICT applications are presenting technology opportunities that did not exist a decade ago.

114
Lab-Volt Systems
1710 Highway 34
Farmingdale, NJ 07727
www.labvolt.com
Lab-Volt develops and supplies schools, industry, and training institutions with hands-on and elearning technical training systems with full curriculum, for workforce development.
213 Lawrence Berkeley National Laboratory
One Cyclotron Road, MS: 7R0222
Berkeley, CA 94720
www.lbl.gov
Berkeley Lab is a member of the national laboratory system supported by the U.S. Department of Energy through its Office of Science. It is managed by the University of California (UC) and is charged with conducting unclassified research across a wide range of scientific disciplines. Located on a 200-acre site in the hills above the UC Berkeley campus that offers spectacular views of the San Francisco Bay, Berkeley Lab employs approximately 4,200 scientists, engineers, support staff and students.

205 MATEC NetWorks: Maricopa Advanced Technology Education Center NetWorks
4110 East Wood Street, Suite 1
Phoenix, AZ 85040
www.matecnetworks.org
MATEC NetWorks is an NSF-ATE Resource Center that provides digital learning resources and faculty professional development opportunities in semiconductor, automated manufacturing, electronics and related fields.

413 MatEd: National Resource Center for Materials Technology Education
20000 68th Avenue West
Lynnwood, WA 98036
www.materialseducation.org
The National Resource Center for Materials Technology Education (MatEd) is a national clearinghouse of resources for materials technology program enhancement.

414 MCIT: Midwest Center for Information Technology
1905 Harney Street
Omaha, NE 68102
www.midwestcenterforit.com
MCIT leverages the cloud to enable collaboration among IT students, instructors and business to solve real-world problems and develop high demand skills.

304 MPICT: Mid-Pacific ICT Center
50 Phelan Avenue, S107
San Francisco, CA 94112
www.mptic.org
MPCIT’s mission is to coordinate, promote and improve the quality of ICT education, with an emphasis on 2-year colleges, in northern California, northern Nevada, southern Oregon, Hawaii and the Pacific Territories.

118 NACK: National Center for Nanotechnology Applications & Career Knowledge at Penn State
101 Innovation Boulevard, Suite 112
University Park, PA 16802
www.nano4me.org
The Nanotechnology Applications and Career Knowledge (NACK) National Center at Penn State has a multitude of resources and services available for the integration of nanotechnology into existing course work and also for starting up complete nanotechnology programs.

207 Nano-Link: Midwest Regional Center for Nanotechnology Education
1300 145th Street East
Rosemount, MN 55068
www.nano-link.org
Nano-Link: Regional Center for Nanotechnology Education. Complete topic specific educational modules for multiple grade levels and programs of study.

116 NanoProfessor
8025 Lamon Avenue
Skokie, IL 60077
www.nanoProfessor.net
The NanoProfessor® Nanoscience Education Program aims to address the growing need for a nano-savvy workforce by providing real-world, hands-on, stimulating nanotechnology education to undergraduate students.

102 National Instruments
11500 North Mopac Exppressway
Austin, TX 78759
www.ni.com/academic
National Instruments provides educators and students with powerful graphical system design software and modular instruments to connect theory with real-world applications.

403 NBC*: Northeast Biomanufacturing Center and Collaborative
340 Dekalb Pike
Blue Bell, PA 19422
www.biomanufacturing.org
The Northeast Biomanufacturing Center and Collaborative supports the education of highly-skilled technicians for the biomanufacturing industry. Come see the NBC* suite of skill standards-based curricular materials.

217 NCATC: National Coalition of Advanced Technology Centers
33607 Seneca Drive
Cleveland, OH 44139
www.ncatc.org
The Coalition is a network of higher education resources that advocates and promotes the use of technology applications that enhance economic and workforce development programs and services.

415 NCME: National Center for Manufacturing Education
444 West Third Street
Dayton, OH 45402
www.ncmeresource.org
NCME serves as a source of materials, support services, and professional development opportunities for manufacturing technologies educators and industry professionals.

218 NEATEC: Northeast Advanced Technological Education Center
80 Vandendenburgh Avenue
Troy, NY 12180
www.neatec.org
NEATEC promotes STEM and technology education and works with industry partners to create and maintain a skilled technical workforce for the semiconductor and nanotechnology industries.

417 Notre Dame de Namur University
650 South Cherry Street, Suite 700
Denver, CO 80246
www.onlineprograms.ndnu.edu
The online Master of Science in Computer and Information Science from Notre Dame de Namur University offers an innovative, cutting-edge curriculum.
Nida Corporation provides performance-based, computer-assisted technician training solutions to military, industry, and academic training programs around the globe.

OP-TEC, an NSF/ATE National Center, is working with secondary, postsecondary and industry partners to increase and sustain our nation’s capacity to produce photonics technicians.

Simtronics Corporation develops and delivers Windows-based operating training simulators for the process industries (including alternative energy) and their supporting educational institutions.

Simtronics Corporation provides performance-based certifications for aerospace technicians and is developing similar products for other technical fields. Join us to explore collaborative opportunities.

The Science Source Company designs and manufactures apparatus for all levels of classroom experimentation, covering physics, engineering, biology, chemistry, and environmental sciences.

SPACETEC® provides performance-based certifications for aerospace technicians and is developing similar products for other technical fields. Join us to explore collaborative opportunities.

Xilinx/Digilent, Inc. make state of the art FPGA technologies accessible in the classroom. Starting at $49, students can own industry grade digital design development kits.
Technology Showcase Prize Drawings

To enter the drawings, complete the Technology Showcase drawing card (included in your conference bag) and drop the card in the designated box at the Registration Desk.

Drawing times

Wednesday: 10:15 A.M., 2:45 P.M. and 5:00 P.M.
Thursday: 10:00 A.M.

- ATE Central: iPod Shuffle
- Bio-Link: A Bio-Link bag of gadgets and treats
- CORD: One free National Career Pathways Network (NCPN) main conference registration for the 2012 conference in Richmond, VA, October 17–19
- EMC Corporation: 1 Iomega Portable Hard Drive
- FLATE: One art poster
- Grand Hyatt San Antonio: Complimentary two-night stay
- MATEC NetWorks: Three gift baskets containing NetWorks goodies and two art posters
- MatEd: A MatEd gift bag
- NACK: Five art posters
- NCME: Flying V style guitar, manufactured in the Guitarbuilding.org lab. Donated by the STEM Guitar Grant and the NCME
- Omni Hotel: Complimentary one-night stay in any Omni Hotel in the U.S. or Canada
- OP-TEC: Five art posters
- US Didactic: Digital camera
**Exhibit Hall** *(Rocky Mountain Event Center)*

<table>
<thead>
<tr>
<th></th>
<th>402</th>
<th>404</th>
<th>406</th>
<th>408</th>
<th>410</th>
<th>412</th>
<th>414</th>
<th>416</th>
</tr>
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<tr>
<td>401</td>
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**Poster Sessions**

<table>
<thead>
<tr>
<th></th>
<th>102</th>
<th>104</th>
<th>106</th>
<th>108</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>107</td>
<td>109</td>
<td>111</td>
<td>113</td>
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<tr>
<td>115</td>
<td>117</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Entrance** *(Rocky Mountain Event Center)*
# Index of Speakers and Presenters

<table>
<thead>
<tr>
<th>A</th>
<th>Addair, Janet 25</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amarante, Joseph 41</td>
</tr>
<tr>
<td></td>
<td>Amu, Suzanne 47</td>
</tr>
<tr>
<td></td>
<td>Anderson, John 34</td>
</tr>
<tr>
<td></td>
<td>Anderson, Will 30</td>
</tr>
<tr>
<td></td>
<td>Awadelkarim, Osama 41</td>
</tr>
<tr>
<td></td>
<td>Awadelkarim, Osama 41</td>
</tr>
<tr>
<td>B</td>
<td>Badway, Norena 42</td>
</tr>
<tr>
<td></td>
<td>Bailey, Terryll 42</td>
</tr>
<tr>
<td></td>
<td>Barger, Marilyn 10, 33, 34, 42</td>
</tr>
<tr>
<td></td>
<td>Bates, Chuck 42</td>
</tr>
<tr>
<td></td>
<td>Beasley, Gary 31</td>
</tr>
<tr>
<td></td>
<td>Beaty, Lawrence 41</td>
</tr>
<tr>
<td></td>
<td>Beheler, Ann 10, 27, 34</td>
</tr>
<tr>
<td></td>
<td>Birk, John 35</td>
</tr>
<tr>
<td></td>
<td>Boisvert, Deborah 15</td>
</tr>
<tr>
<td></td>
<td>Bower, Rachel 33</td>
</tr>
<tr>
<td></td>
<td>Bowne, Sam 47</td>
</tr>
<tr>
<td></td>
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