

BUILDING FUTURES THROUGH *STEM* EDUCATION

October 1, 2010
8:30 am - 4:00 pm



Science, Technology, Engineering and Math

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A G E N D A

Stop by and check out Penn State's Solar Power Trailer

The Penn State Center for Sustainability Solar Power Trailer was designed and built to support hands-on solar energy education. The trailer features a functional grid independent solar energy system to support education and solar construction activities. The trailer also includes solar training equipment that can be assembled and disassembled to support educational experiences.



8:45 to 9:15	REGISTRATION and Continental Breakfast
9:15 to 10:00	Welcome and Opening Comments Maureen Ryan, STEM Coordinator, Penn State New Kensington Dr. Kevin Snider, Chancellor, Penn State New Kensington Keynote Speaker: Dr. James Pawelczyk, Penn State University
10:15 – 12:00	AM Breakout Sessions Session A: <i>STEM Education and the Challenges Facing K-16 Education</i> Session B: <i>Regenerative Medicine: Exciting our Region's Youth About the Life Sciences</i> Session C: <i>Westinghouse: A Company Built on STEM</i> Session D: <i>Penn State University's Center for Sustainability: Solar Energy</i> Session E: <i>Value Added STEM Education Through CTC</i> Session F: <i>Adventures in Technology</i>
12:00 – 1:00	Luncheon Keynote Speaker: Dr. Jimmy Williams, Jr., Alcoa Outstanding STEM Teacher Awards Presentation
1:15 – 2:00	Industry Panel Presentation – “An Employer’s Perspective on Future Skills”
2:15 – 3:00	PM Breakout Sessions Session G: <i>BotsIQ: Past, Present and Future</i> Session H: <i>Involving Students in Undergraduate Research</i> Session J: <i>Dissecting An Education</i>
3:15 – 4:00	Closing Keynote Speaker: Dr. C. Edward Eckert, Apogee Technology, Inc.
4:00	Closing Remarks

Science, Technology, Engineering and Math

8:45 to 9:15 **REGISTRATION and Continental Breakfast** Room: Theater Lobby

9:15 to 10:00 **Welcome and Opening Comments:** Room: Theater



Keynote Speaker - "What Price a Martian?"

Dr. James Pawelczyk, Associate Professor of Physiology, Kinesiology and Medicine
The Penn State University

James A. (Jim) Pawelczyk received Bachelor of Arts Degrees in Biology and Psychology from the University of Rochester in 1982, a Masters of Science in Physiology from Penn State University in 1985, and a Ph.D. in Biology (Physiology) from the University of North Texas in 1989. He completed a post-doctoral fellowship at the University of Texas Southwestern Medical Center at Dallas in 1992, then joined the faculty as an Assistant Professor of Cardiology and

Bioengineering. In that capacity he served as the Director of the Autonomic and Exercise Physiology Laboratories and a founding member of the Institute for Exercise and Environmental Medicine, clinical research collaboration between UT Southwestern and Presbyterian Hospital of Dallas. In 1995 he joined the faculty of the Pennsylvania State University where he is now an Associate Professor of Physiology, Kinesiology and Medicine. Dr. Pawelczyk's research focuses on the dynamic regulation of blood pressure, and how disuse atrophy affects blood pressure regulation, a condition that is routinely observed following spaceflight, which Dr. Pawelczyk has studied as a NASA funded investigator for the past six years. In 1995 he was selected as a Payload Specialist for the Neurolab space shuttle mission, and flew aboard STS-90 on the space shuttle Columbia in April and May of 1998. He logged 16 days and 6.4 million miles in space, circling the earth 256 times and conducting neuroscience experiments that addressed changes in the development of the nervous system, balance, blood pressure regulation, sleep, and control movement during spaceflight.

Dr. Pawelczyk assists the formation of U.S. space life sciences strategy. He has testified before the United States Senate Subcommittee on Science and Space, and is an active member of the National Research Council's Space Studies Board and the Institute of Medicine's Committee on Aerospace Medicine and Extreme Environments. Both are part of the National Academies, chartered by Congress to address critical national issues and give advice to the federal government and the public.

Dr. Pawelczyk will discuss some of the technical and scientific hurdles that must be overcome to enable human planetary exploration. By integrating chemistry, engineering, life and social sciences, Dr. Pawelczyk will explain how humans will adapt to a 30 month trip to Mars.

10:15 – 12:00 **AM Breakout Sessions**

10:15 to 11:00

SESSION A

STEM Education and the Challenges Facing K-16 Education

Barbara Houtz, Director of Outreach, The Penn State University

Theater

How do American students compare to their international counterparts when it comes to math and science? What can we, as educators, business owners, parents, and community members do to improve our students' achievements in STEM subjects? This presentation will take a look at the latest information about K-16 STEM education and offer some suggestions appropriate for schools, businesses, and the community at large.

SESSION B

Regenerative Medicine: Exciting our Region's Youth About the Life Sciences

*Joan F. Schanck, MPA, Director, Education and Workforce Development
Pittsburgh Tissue Engineering Initiative*

121 Engineering

Ms. Schanck will provide an overview of the background and history of Pittsburgh Tissue Engineering Initiative and will define the term "regenerative medicine." She will also discuss how regenerative medicine is effective in the classroom in supporting the study of biology and the life sciences and how the Pittsburgh Tissue Engineering Initiative is supporting educational initiatives throughout southwestern Pennsylvania.

SESSION C

Westinghouse: A Company Built on STEM

*James Ice, Director, Talent Management
Westinghouse Corporation*

Art Gallery

Westinghouse has a long history of innovation leadership - from inventing AC current, to Nuclear Power. This session will discuss our commitment to STEM education (elementary through college); hiring students with STEM skills (over 4000 in last 3 years) and continuing STEM skill development of our employees (through Westinghouse University) to support our rapidly growing business.

11:15 to 12:00

SESSION D

Penn State University's Center for Sustainability: Solar Energy

*Lisa Riley Brown, Associate Director
Penn State Center for Sustainability*

Art Gallery

The Northern Mid-Atlantic Solar Education and Resource Center at Penn State is working with colleges and universities across our region to expand opportunities for students to understand solar energy systems and

to gain the skills and experience necessary for successful careers in this exciting and growing field. We will share resources that will help precollege teachers bring solar energy activities into their classrooms.

SESSION E

Value Added STEM Education Through CTC

Paul Heasley, Teacher, State College Area School District, Career & Technology Center

I21 Engineering

Mr. Heasley will provide an overview on how the State College High School has integrated the CTC programs and academic departments using STEM and STEM-like opportunities. The presentation will focus on Agriscience projects that have given students opportunities and recognition outside of the district.

SESSION F

Adventures in Technology

Scott Dietz, Manager, Workforce Initiatives, Catalyst Connection

Theater

By teaming students with local companies to solve real-world problems with real-world solutions, Adventures in Technology generates excitement about STEM related careers. Attend this session to learn about a unique, 10-week program that is a proven model of community partnership across schools, industry, Workforce Investment Boards, and other state/local programs. Included is an overview of the 8 year success of the program in Southwestern Pennsylvania, eastern PA, and Michigan, details of how the program is connected to other regional organizations and efforts, student outcomes and impact on local industry, the short and long term benefits of the program, New Adventures in Technology developments – classroom integration and mass exposure, and next steps of how the program can be replicated in other regions in PA.

12:00 – 1:00 Luncheon

51 Conference Center

Keynote Speaker: Dr. Jimmy Williams, Jr., Director of Product Strategy and Applications, Military and Defense Sector, Alcoa Technical Center

Outstanding STEM Teacher Awards Presentation: Joy Bruno, Penn State New Kensington Youth Program Coordinator
Recognition of local K-12 teachers integrating STEM into the classroom through innovative teaching methods.

1:15 – 2:00 Industry Panel Presentation

An Employer's Perspective on Future Skills

Theater

STEM Skills are being touted as those that will have the highest demand by business and industry for the foreseeable future. Representatives from locally based companies whose futures depend on the qualifications of our local workforce will discuss how markets are changing in their industries and what skills their employees are going to need in order for them to remain competitive in a global market.

Moderated by: Patricia Hollinger, Outreach Coordinator, Penn State New Kensington

Panel members include:

Mr. John Scarfutti - Vice President, Human Resources at ATI Allegheny Ludlum

Dr. Berni Jordan - Manager, Training & Organizational Effectiveness, West Penn Allegheny Health System

Mr. John Friel, Former President and CEO of Medrad, Inc.

Stephen Bechtold, Principal Software Architect, Giant Eagle

2:15 – 3:00

SESSION G

BotsIQ: Past, Present and Future

Phyllis Miller, Human Resources Manager

Hamill Manufacturing

Theater

Phyllis Miller will provide a history and overview of the BotsIQ initiative, an effort initiated by the National Tooling and Machining Association and local manufacturers, workforce development organizations and local colleges to address the growing shortage of highly skilled technical workers for the manufacturing industry. By building 15-pound battling robots for an annual competition, high school and vo-tech teams learn the technical and soft skills needed by industry. BotsIQ is unique in the way it partners each team with a local manufacturing company. In just five years, the program has grown to 44 teams throughout Southwestern PA with over 400 participating students per year.

SESSION H

Involving Students in Undergraduate Research

Robert Mathers, Chemistry Professor

Penn State New Kensington

I35 Engineering

This presentation will discuss methods for involving students in “hands-on” projects to stimulate their interest in science. Particularly, we will examine recent efforts at Penn State New Kensington to attract students to consider undergraduate research. Over the last six years, a number of students have conducted polymer research in my laboratory. This discussion will highlight some of techniques to help students realize the beneficial nature of becoming an independent and motivated researcher.

SESSION J

Dissecting An Education

John Mazurowski, Senior Research Engineer

Penn State Electro-Optics Center

Art Gallery

Why do we need to take the subjects that we do? How should we choose our college courses? How does our education connect to our future? Mr. Mazurowski, a physicist and senior research engineer at Penn State Electro-Optics Center, is a dedicated lifelong learner. He will help us understand the roles of science and mathematics, and why they need not be intimidating.



3:15 – 4:00 Closing Keynote

STEM Moving into the Future

Ed Eckert, Apogee Technology, Inc.

Theater

Dr. C. Edward Eckert is President of Apogee Technology, Inc. and Quantum Environmental Dynamics, Inc. Apogee primarily develops high efficiency/high rate melting technology and molten metal treatment reactors for aluminum, which are used by General Motors, Aleris International, Briggs and Stratton, and others. Eckert also provides consulting services for several Fortune 500 companies, including aerospace and the military. He holds an adjunct professorship at Worcester Polytechnic Institute.

Eckert's primary research interests include fluid flow and phase separation, phase equilibria and reaction kinetics in metal treatment reactions, plasma based materials processing, high rate heat transfer, aqueous phase oxygen dissolution, biomass derivative fuels, and aerospace (turbine) propulsion.

Eckert performed his undergraduate work in Metallurgical Engineering at the University of Pittsburgh, and received his Ph.D. in Materials Engineering from Drexel University through an Alcoa fellowship.

Dr. Eckert will emphasize the need for creative thinking in the science based disciplines. Absent a fundamental understanding of the sciences, however, such thinking will be stifled and/or misdirected. Sustainable passion at an early age is the gateway to this understanding. Contemporary societal distractions are facilitated by the very technology that we strive to develop. The pedagogical community must itself therefore be innovative and proactive to impassion the technologically oriented for a lifetime of effective creative thinking. Creativity cannot be taught, but it can be inculcated.

4:00 Closing Remarks

Maureen Ryan, STEM Coordinator, Penn State New Kensington

Theater

