STEM Summit

Norwin School District

Monday, March 12, 2012
8:30 a.m. to Noon
Norwin High School
Norwin School District STEM Summit

Agenda

8:00 to 8:30 a.m.  Continental Breakfast
Norwin High School Cafeteria

8:30 to 8:35 a.m.  Welcome
Mr. Danylko Hankewycz, Norwin High School Class of 2012
Norwin High School Auditorium

8:35 to 9:30 a.m.  Introduction of Keynote Speakers
Dr. William H. Kerr, Superintendent of Schools, Norwin School District

Keynote Speakers
Dr. Lawrence Mussoline, Superintendent, Downingtown Area School District
Mr. George Fiore, Headmaster of the STEM Academy, Downingtown Area School District

9:30 to 10:30 a.m.  STEM Panel Discussion Moderated by:
Mr. Michael Choby, High School Assistant Principal/Coordinator of STEM Education
Panelists:
Mr. John Caverno, Senior Vice President of Human Resources and Chief Human Resources Officer, Excela Health
Mr. Jean-Dominique Le Garrec, Engineering Services Growth, Westinghouse Electric Company
Mr. Todd Fleming, Director of Business Development, PDS Industries
Dr. Robert Scherrer, Principal, Pittsburgh Science & Technology Academy
Mr. Glenn Skena, Manager, Methods Engineering, Hamill Manufacturing Company
Ms. Mehgan Riley, Kennametal Foundation Coordinator, Kennametal Inc.

10:30 to 10:45 a.m.  Break and Report to Breakout Sessions

10:45 to 11:45 a.m.  Breakout Sessions

11:45 to 11:55 a.m.  Break and Report to Auditorium for Closing Remarks

11:55 to Noon  Closing Remarks
Dr. Tracy A. McNelly, Assistant Superintendent of Secondary Education
Keynote Speakers

Dr. Lawrence Mussoline
Superintendent
Downingtown Area School District

Dr. Lawrence Mussoline will speak about the Downingtown STEM Academy that opened in August 2011. The school features a project-based learning environment in which students are exposed to the kinds of design and implementation practices that scientists and engineers use on a regular basis.

Dr. Mussoline has worked in public education for 33 years as a teacher and administrator. A superintendent of schools in Pennsylvania for the past 13 years, currently he is the Superintendent of the 12,400 student Downingtown Area School District. Dr. Mussoline has taught at both the undergraduate and graduate levels in three Pennsylvania universities. Dr. Mussoline was named Young Alumnus of the Year from Bloomsburg University and awarded the Cooperative Leadership Award from the National School Study Council for his work at Lehigh University. Dr. Mussoline teaches in the Pennsylvania Department of Education’s Inspired Leadership Program and has presented at the local, state, and national levels on a myriad of educational topics. Dr. Mussoline earned a Ph.D. in Education Administration from the Pennsylvania State University.

Mr. George Fiore
Headmaster of the STEM Academy,
Downingtown Area School District

Mr. George Fiore has served as Headmaster of the Downingtown STEM Academy for two years. During that time, he has led the development and implementation of one of the most innovative educational programs in the nation. The STEM Academy is one of the only International Baccalaureate World schools with a Science, Technology, Engineering, and Mathematics focus. The STEM Academy is an effort-based school that focuses on partnering with the business community to provide a 21st Century education. Prior to joining the Downingtown Area School District, Mr. Fiore was a Junior High School Principal, Assistant High School Principal, Director of Instructional Technology, and a High School Social Studies teacher. Mr. Fiore is currently pursuing his doctorate with the support of his wife Lora and children Anthony and Gianna.
John C. Caverno is Chief Human Resource Officer and Senior Vice President for Human Resources at Excela Health. Mr. Caverno joined the health system in 2007 from Kennametal, Inc., headquartered in Unity Township, where he served as Human Resource Director for the 43-site Global Manufacturing footprint of that organization.

Mr. Caverno has had a successful career as a human resource executive with several companies besides Kennametal, including Invensys Metering Systems, SGL Carbon Group, US Airways and the Joseph Horne Company.

Mr. Caverno offers particular expertise in recruitment, labor relations, employee satisfaction and talent development, including performance management and succession planning. He is responsible for all human resource functions for Excela Health, including Organizational Development.

Since coming to Excela Health, Mr. Caverno has been instrumental in building a highly successful employee wellness program, which led to recognition as a 2011 Healthiest Workplace in the Pittsburgh region. These wellness efforts have been spotlighted in the Pittsburgh Business Times, Smart Business magazine, and an upcoming issue of Pittsburgh Quarterly.

Jean-Dominique (JD) was born in Northern France and lived in that country and in Namibia, Africa. He moved to Pittsburgh in 2003 where he lives with his wife and three daughters.

JD holds a Master in Electrical Engineering from Ecole Supérieure d’Electricité in Paris, a Master of Science in Management from the Massachusetts Institute of Technology and a Master of Science in Law from the University of Pittsburgh School of Law.

JD successively served as General Manager of a food company in the North of France, of the Chamber of Commerce of the Var Region in Southern France and of a seafood company in Namibia. He currently works for the Westinghouse Electric Company LLC in Cranberry, PA, on international business development projects.

JD has also served as an honorary consul of France in Pittsburgh since 2009.

Todd Fleming grew up in Western PA. He received a BS in Industrial Engineering from Lehigh University in 2002. After graduating, he ended up in northern NJ working as a project engineer for a stamping and plastic injection molding manufacturer primarily serving the automotive and medical device industries. Upon moving back to the western PA region in 2007, he began working as a project manager for an architectural materials manufacturer heading up their program supplying Apple with stainless steel panels used to finish their retail stores. By the middle of 2009, he took up his current position at PDS Industries and has been managing various projects related to both internal and external development of the company.
Glenn Skena grew up in Murrysville, PA and graduated from Franklin High School & Forbes Trail Technical School in Machine Shop Trades. He was hired by Hamill Manufacturing Company as a Machinist Apprentice. Upon graduating the 4-year Apprenticeship program and receiving his Journeyman Machinist papers from the PA Department of Labor and Hamill, Mr. Skena enrolled in the Welding Engineering Technology program at the newly founded Westmoreland County Community College. While working full time and attending classes for 5 years, he graduated with an associate degree. He immediately accepted a position as Welder/ Welding Supervisor at Hamill. After working for about 10 years in that position, an opening developed in the Proposal Development department at Hamill. Mr. Skena was promoted to a managerial position in that department. With this position, he assumed responsibility for recruiting and hiring apprentices for the Machinist Apprenticeship.

Robert J. Scherrer, Ed. D.
Principal, Pittsburgh Science & Technology Academy 6-12,
Pittsburgh Public School District

Prior to becoming the principal of the Pittsburgh Science & Technology Academy, Dr. Scherrer served as the Principal of Pittsburgh Allderdice High School. The largest of the high schools in the Pittsburgh Public Schools, Allderdice was recognized as a Silver Medal school by US News and World Report magazine. Dr. Scherrer was the Principal of Curriculum and Instruction at Woodland Hills High School prior to joining the Pittsburgh Public Schools. He also spent time as an assistant principal in the Peters Township and Woodland Hills School Districts and began his educational career as a teacher at Baldwin High School.

Within the District, Dr. Scherrer serves as a mentor principal in the Pittsburgh Emerging Leaders Academy and to new principals. He also was awarded the 2009 Kaye Cupples Award for administrators who exemplify outstanding inclusive practices by the Pittsburgh Local Task Force on the Right to Education.

Dr. Scherrer received his Ed. D. in School Leadership and his Superintendent's Letter of Eligibility from the University of Pittsburgh. He earned his Principal's Certification, Master's in Education and Bachelor's in Business Education from the Indiana University of Pennsylvania.

Mehgan Riley
Kennametal Foundation Coordinator
Kennametal Inc., Latrobe, PA

Ms. Riley is the Kennametal Foundation Coordinator, which plays an important role in supporting Kennametal’s values and objectives as a strong corporate citizen. In this role, she is responsible for the daily outreach efforts of the Kennametal Foundation and helps to run its cornerstone program, the Kennametal Foundation Young Engineers Program. Ms. Riley joined Kennametal in June, 2010. She holds a BS in Business Administration from the University of Pittsburgh.
Learn More about the Downingtown STEM Academy: Q & A with Our Keynote Speaker
Room 135  Presenters: Dr. Lawrence Mussoline and George Fiore

In this session, our Keynote presenters will spend time talking about the Downingtown STEM Academy, which offers a curriculum focused on Science, Technology, Engineering and Mathematics Pathways, and answering participant questions.

Dr. Mussoline worked in public education for 33 years as a teacher and administrator and as a superintendent of schools in Pennsylvania for the past 13 years. He is currently the Superintendent of the Downingtown Area School District. Mr. Fiore has served as Headmaster of the Downingtown STEM Academy for two years. Prior to this, Mr. Fiore worked as a Junior High School Principal, Assistant High School Principal, Director of Instructional Technology, and a High School Social Studies teacher.

Robotics as a STEM Tool
Room 122  Presenters: Matt Mincucci & Robert Shuber

This session will demonstrate how robotics can be a useful tool for integrating STEM into any classroom. Robotics can be used to teach any subject in a fun and exciting way bringing 21st and 22nd century skills into your classroom. Robots are a great way to build interest in the STEM areas for young children and female students. We will discuss options for age appropriate hardware and software choices, purchasing and funding a robotics program and integrating robotics into your school. Move over Will Robinson, the future of STEM education is here!

Matt Mincucci is a 7th grade technology education teacher, robotics club advisor and robotics camp coordinator at Norwin Middle School with over 13 years of experience. Matt has taught robotics in various settings to students from 6th to 12th grade. He was a presenter at this year’s Technology and Engineering Education Association of Pennsylvania Conference in Camp Hill, PA. Robert Shuber is a technology education teacher at Norwin High School where he teaches robotics, engineering, and manufacturing. Mr. Shuber and his students have participated in regional robotic events for the last three years. Currently, he uses the VEX platform, RobotC programming software, and Autodesk Inventor design software in his robotics classroom.

Developing a Vision for STEM Education
Room 130  Presenter: Gabriela Rose

Being competitive in a global society requires all students to be prepared in STEM subjects. STEM and 21st Century literacy is no longer just a prerequisite for college-bound students but has become a necessity for all students to be career-ready. This new reality has led to calls for a focus on STEM education by numerous organizations. But what does a vision for successful STEM education look like in the classroom? Participants in this session will develop a common vision for STEM education based on a number of pertinent national publications and short video clips.

Gabriela Rose is the Science Coordinator for the Math Science Collaborative at Allegheny and Westmoreland Intermediate Units. As a K-12 Science Coordinator with the Math Science Collaborative, Gabriela works with cohorts of teachers and administrators to improve the learning and teaching of science.

Successful K-12 STEM Education: How Might Common Core State Academic Standards Help?
Room 138  Presenter: Michael Fierle

Having clear targets for what is taught matters. Using the Common Core State Standards to have fewer, clearer, and more rigorous standards is a key strategy being pursued by the majority of states, including PA. What do these new standards require of students? How do they differ from current expectations? How can implementing them develop the creative problem-solvers the future demands? Facilitated by professional staff developers from the Math & Science Collaborative, this session will introduce participants to the Common Core State Standards. Participants will explore the mathematical practices as well as the scientific and engineering practices from the national Framework for K-12 Science Education.

Michael Fierle is the Mathematics Coordinator for the Math Science Collaborative, Allegheny Intermediate and Westmoreland Intermediate Units. Michael works with cohorts of teachers and administrators throughout SWPA to improve the learning and teaching of mathematics.
**Engineering is Elementary Program**  
*Room 133*  
*Presenters: Greg Egnor, Jenifer Baxter-Blubaugh & Monica Young*

*Engineering is Elementary* (EiE) fosters engineering and technological literacy among children. EiE has created a research-based, standards-driven, and classroom-tested curriculum that integrates engineering and technology concepts and skills with elementary science topics. EiE lessons not only promote science, technology, engineering, and mathematics (STEM) learning, but also connect with literacy and social studies. Storybooks featuring children from a variety of cultures and backgrounds introduce students to an engineering problem. Students are then challenged to solve a problem similar to that faced by the storybook character. Through a hands-on engineering design challenge, students work in teams to apply their knowledge of science and mathematics; use their inquiry and problem-solving skills; and tap their creativity as they design, create, and improve possible solutions. In the end, students realize that everyone can engineer!

Gregory Egnor is the Principal of Stewart Elementary STEM school in the Burrell School District. Jenifer Baxter-Blubaugh is a 4th grade teacher for Stewart Elementary. Monica Young is a 5th grade teacher for Stewart Elementary. Both teachers are leaders for the school’s Energy & Green Engineering club.

**National Geographic Science Program**  
*Room 136*  
*Presenters: Dave Lynn, Julie Hazlett, Brian Colgan & Rosalyn Wall*

The National Geographic Science program immerses students into the nature of science and inquiry, and builds scientific and content literacy. Lessons are designed around these guiding principles allowing for authentic inquiry-based science. Inquiry is the primary instructional tool, and is assessed regularly throughout the program. The National Geographic Science Program offers four levels of inquiry. The explore activity is the first level of inquiry where students are given directions and instructions about how to go about answering a question. They already know the answer to the question being asked. The direct inquiry is the second level of inquiry where the students are provided the problem and the procedure, but are left to reach their own conclusions based on data interpretation. The guided inquiry is the third level of inquiry where students are provided a problem or questions, but are left to devise their own method and solutions to come up with a conclusion. The open-ended inquiry is the highest level of inquiry where problems, methods, and solutions are derived by students as they design their own experiment to investigate a problem. Students will collect their own data and use evidence to reach their own conclusion.

Dave Lynn is a consultant for National Geographic Science. Julie Hazlett is a math specialist for Stewart Elementary in the Burrell School District. Brian Colgan is a science specialist for Stewart Elementary. Rosalyn Wall is the national education consultant for National Geographic Learning.

**Kennametal Foundation Young Engineers Program**  
*Room 134*  
*Presenters: Mehgan Riley, Dr. Gennaro Piraino & Students from Greater Latrobe High School*

The Kennametal Foundation *Young Engineers Program* provides a hands-on experience for local high school juniors and seniors interested in engineering. The program began in September 2011 in conjunction with Greater Latrobe School District. Fifteen high school juniors and seniors enrolled in the 15-week program at Kennametal’s world headquarters in Latrobe, Pennsylvania. Kennametal’s world-class technology innovation center serves as the backdrop for the program, showcasing engineering careers and modern manufacturing through experience. The program provides a variety of experiences for the students, including classroom discussion, hands-on projects, mentoring from our world-class engineers and manufacturing insight experiences at Kennametal’s various facilities. A select group of nearly 30 talented employees teaches each class from various Kennametal locations. They have been identified as *Innovators*. The role of the *Innovator* serves as an advocate and point of contact between the administrators of the program and the students. Designed to highlight engineering careers and modern manufacturing through experience, the program is one of many education and training programs already in place across the company’s global operations.

Mehgan Riley is the Kennametal Foundation Coordinator and Dr. Gennaro Piraino is the Assistant Superintendent of Curriculum & Instruction at Greater Latrobe High School.
Biotechnology, Bioengineering, & DNA, Oh My!!!

*Room 142*  
*Presenter: Andrea Redinger*

Biotechnology, or the manipulation of any living system for the purpose of producing a useful product or solving a problem, is today’s “science in the news.” Even though it may be a “mouthful” to describe, biotechnology is a multidisciplinary science with many powerful applications and great potential for future discoveries. Teachers will be provided with ideas on implementing biotechnology and bioengineering into their current science curriculum.

**Andrea Redinger** is a Biology Teacher in the Greensburg Salem High School. She is the Founder and President of PASCC (PA Science Curriculum Council) and the SW Representative of the Pennsylvania Science Teachers’ Association (PSTA). She was recently awarded the 2011 Outstanding Biology Teacher Award for Pennsylvania by the National Association of Biology Teachers.

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What Will Carnegie Science Center’s Chevron Center for STEM Education and Career Development Do for You?

*Room 145*  
*Presenter: Linda Ortenzo*

Learn about new opportunities available through Carnegie Science Center’s Chevron Center for STEM Education and Career Development for teachers, administrators and students. These initiatives convene educators, industry leaders, and STEM organizations to provide Pre K-12 students with innovative, hands-on curriculum and real-world experiences to prepare them for 21st Century careers.

**Linda Ortenzo**, the Director of STEM Programs at Carnegie Science Center, has 16 years experience in informal science education. She currently oversees Carnegie Science Center’s STEM Programs team, which produces special programs and competitions for more than 10,000 middle and high school students each year. She also is the Assistant Director of the Science & Education Division where she is responsible for incorporating a STEM workforce development perspective into all of the Science Center's programs, exhibits and outreach presentations.

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Regenerative Medicine: Growing Futures in STEM Education and the K-12 Classroom

*Room 146*  
*Presenter: Joan F. Schanck, MPA*

A starfish can grow a new arm, but you can’t. A salamander can regenerate a severed leg, but humans have to rely on man-made prosthetic limbs. Can Pittsburgh’s researchers and clinicians fabricate new tissues and organs or induce damaged tissues to regenerate? Can K-12 STEM educators translate the promise of tissue engineering and regenerative medicine (TERM) to diverse student populations to reinforce learning and excite interest? Because tomorrow’s scientists and engineers emerge from today’s youthful students, students must be actively exposed to the interdisciplinary nature of the STEM fields of the future. Hence, TERM provides an ideal exemplar for STEM education and an enticing hook to capture students’ interests. This session provides a brief introduction to this remarkable field, followed by an overview of suggested classroom uses of the curricula, resources and opportunities available to engage middle and high school students and teachers. Central to the Pittsburgh Tissue Engineering Initiative’s mission is an educational mandate to develop and implement educational models and programs to grow a pipeline of talent required to support this field.

**Joan F. Schanck** is the Director of Education & Workforce Development at the Pittsburgh Tissue Engineering Initiative, Inc. (PTEI). Joan joined PTEI in 2001. Her work is focused on providing high-quality education within the field of regenerative medicine. She is a principal investigator of various National Institutes of Health, National Science Foundation and Department of Defense projects for development of regional and national education initiatives.
### ScALuDa: Bring STEM Alumni Back Into Your Classroom

**Room 137  Presenter: Matt Anticole**

A school district invests a lot of time and effort into its students, many of whom go off to do amazing things in engineering, medicine and science. These alumni are filled with stories and experiences that can enhance instruction and ignite interest among students toward STEM fields. This presentation will share one teacher's experiences in founding and growing a "Science Alumni Day," aka, "ScALuDa" program. From humble origins, the most recent event included approximately 2500 students in grades 6-12 attending seminars by 40 alumni presenters over two days in December 2011. The presenter will share different formats that have been tried over the years, along with the strengths and limitations of each. Also shared will be advice on steps teachers and other school professionals can take now to begin to grow the program in their own districts. Finally, the presenter will identify a few areas where his science department has been able to benefit in unforeseen ways from a robust and current science alumni database.

**Matt Anticole** is a science teacher at the Norwin High School. After completing his B.S. in Physics and teaching certification at the University of Pittsburgh, Matt was hired by Norwin in 1996. Since then, he has completed a Masters in Science Education as well as a second certification in Earth and Space Science. He earned National Board Teacher Certification in 2011 in Physics for "Adolescence and Young Adulthood."

### Engaging Girls in STEM

**Room 132  Presenters: Lori Harvey & Colleen Smith**

A strong and plentiful pipeline of well-educated STEM students and prospective employees will exist only if girls and women are a piece of the equation. The Female Alliance for STEM Excellence (FASE) and its partners in education, business, industry, and government are teaming up to change the culture for girls and women in STEM. Recognition Nights, FASE Discovery Camps, and TechNights are a few of the regional projects that are successfully impacting the engagement of girls in STEM in our area. You'll walk away with proven program ideas, guides for implementation and evaluation, and resources to strengthen your network and your involvement in girl-focused STEM initiatives.

In her role in Education and Outreach at the Penn State Electro-Optics Center in Freeport, PA, **Lori Harvey** engages with a wide range of organizations in education, business, industry, and government, including the Champions Board for the PA STEM Girls Collaborative Project and the Female Alliance for STEM Excellence (FASE). When asked about her job, she will say that she “connects the dots” to help get resources into the right hands.

**Colleen Smith** works in Education and Outreach at the Penn State Electro-Optics Center in Freeport, PA. She is passionate about supporting education and promoting equity in education. She serves as the Chairperson for the Female Alliance for STEM Excellence (FASE) and is a Leadership Team member for the PA STEM Girls Collaborative Project.

### What the Frack?

**Room 144  Presenter: Sarah Kucherer**

What and where is the Marcellus Shale and why do we hear about it in the news? Marcellus Shale is a huge issue for scientists and the general public; it is a source of controversy and revenue. This program describes Marcellus Shale and debatable issues surrounding drilling in PA. We will explore ways to teach students about this issue. We need to equip them to evaluate and prepare for technological and societal challenges. Sources of reliable information will be provided.

**Sarah Kucherer** teaches chemistry and forensic science at Hempfield Area High School. She is a member of the National Science Teachers Association and the Association of American University Women. She became a teacher after working in the field of forensic science for 20 years.
Thank You!
Thank you to the following individuals and business for contributing to the success of the Norwin School District STEM Summit.

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NORWIN SCHOOL DISTRICT

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