Monday, July 30, 2018

Session 1, 10:15 – 11:15 AM
Session 2, 2:00 – 3:00 PM
Session 3, 3:15 – 4:15 PM
Session 4, 4:30 – 5:30 PM

Tuesday, July 31, 2018

Session 5, 8:00 - 9:00 AM
Session 6, 9:15 - 10:15 AM
Session 7, 1:00 - 2:00 PM
Session 8, 2:15 - 3:15 PM
Session 9, 3:30 - 4:00 PM

------------- Grade Levels -------------

K-4  5-8  9-12  13-16

--- Image KEY ---

S  T  E  M  Arts

July 30, 2018

Session 1, Monday, 10:15 – 11:15 AM

K-4  5-8  9-12

1A Physical Health Sciences Building - PHS 105
Jon Kriegel - Rochester Engineering Society

Professional Volunteer STEM Coaches Empower STEM Teachers

In the ‘90s, Eastman Kodak put 1500 technical volunteers into Rochester City School classrooms for 2-hour visits, twice per week, for a period of ten years. The goal was to provide the classroom-teacher with real-world application examples, hardware to make learning “hands on”, and enumerable Project-based-learning examples that were based upon how we earned our living. Can the RES, as a technical Society with a similar work-force, (actually even many of the same people), do less? The dream of the RES STEM Bridges (stem-bridges.org) initiative is to tap members of the technical community to become Volunteer STEM Coaches. We are anxious to connect Engineers, Physicians, Entrepreneurs, and Manufacturers, etc. with STEM teachers for STEM support during actual class-time.

5-8  9-12

1B Physical Health Sciences Building - PHS 216
Mark Belden - Schuylerville Central School
Jeff Branson (via video link) - Sparkfun Education

Creating Pixel Art Using Processing and Java

Have you have ever wondered how to integrate coding into your classroom? Not sure where to start? This is the workshop for you! We will use the coordinate plane and graph paper to create images. Through the use of processing software they will be converted to Java Code and displayed on a computer screen. Processing software is a free download from
processing.org and it runs on Mac, PC, Android and Linux. This class will get you started with the basics of Java, what a pixel really is and how computers create display colors. Jeff Branson from Sparkfun Electronics will be video conferencing with the class. Jeff will be sharing his knowledge and experience with us. https://blog.sparkuneducation.com/author/jeff-branson  https://www.facebook.com/SparkFun/posts/10152011617151416

### The Application of 3D Technology in SUNY Potsdam STEAM Education

Every year, several thousands of students at SUNY Potsdam take classes in the departments of STEAM. SUNY Potsdam established makerspaces on campus (located in library) and also offer classes, such as: INTD-3D Printing and Modeling; ARTS-Ceramics, etc. SUNY Potsdam integrate 3D technology into STEAM education is to challenge and motivate students to think creatively as they design and build scientific and artistic models; to allow students an opportunity to design, invent and explore using computer technology and being able to see their design; to help local businesses and tech companies.

### STEM Teacher/Science Teacher: What's the Difference?

Distinguishing between science and STEM is important as teachers integrate STEM in their practice. Join us to discuss the unique nature of STEM, the research-based instructional strategies necessary to support its outcomes, and a STEM certification pathway that encourages self-reflection and growth in STEM teaching.

### Methods of STEM Education PK-5

The connection between Common Core State Standards ELA and Math with STEM content and Next Generation practices makes elementary classroom ripe for inspiring the next generation of STEM literate citizens. Targeted professional development can support teachers in integrating STEM in meaningful ways for students. Join the Endeavor Project in sharing an authentic lesson from NASA's Mars Trek.
Session 2, Monday, 2:00 – 3:00 PM

K-4  5-8   9-12  13-16

2A Physical Health Sciences Building - PHS 101
Caitlin Bowen - NYSTEEA, NYS STEM, WNY STEM Hub

**Embedding STEAM**

Attend this session to learn more about how STEAM education can be embedded in any and all PK-12 courses. Many times, STEAM is looked at as a separate discipline or course, but misses key elements of what STEAM is all about. Come listen to a different perspective from an educator and instructional coach. The goal is for attendees to walk away with a few tools to add to their tool box on methods to approach STEAM that is unique and good for kids!

K-4  5-8

2B Physical Health Sciences Building - PHS 216
Michael Jabot - SUNY Fredonia

**From Space to Earth**

This session will share the development of methodologies for a systems based approach in the classroom setting. The methodologies shared will center on a place-based initiative which integrates with the Global Learning and Observation to Benefit the Environment (GLOBE) program. Particular focus will be given to the developmental progression used to foster the skills needed by students to collect, analyze and share their data using geospatial technologies. The innovation shared, while being focused on a particular region, is easily scalable by participants for their own application.

K-4  5-8  9-12

2C Physical Health Sciences Building - PHS 218
Sarah Lorya - Solar One

**The Green Design Lab- Building STEM Skills Through Interdisciplinary Activities**

How can we prepare our students to build a more energy-efficient and sustainable future? This session presents Green Design Lab, an innovative curricular guide for educators that uses hands-on activities to strengthen STEM skills. During the workshop teachers will conduct an energy audit, build batteries, experiment with solar circuits and more. Teachers will discover new methods for reducing energy use in their school buildings, and receive lesson plans that are aligned with CCLS, NYS MST, and NGSS.

13-16

2D Physical Health Sciences Building - PHS 219
Xiao-Ning Zhang - Department of Biology, St. Bonaventure University
Jacqueline Philp - School of Education, St. Bonaventure University

**Teaching Biotechnology and GMOs to Non-Science Majors in College**

Making every student feel that science is relevant to them is challenging. A general education course on biotechnology and GMOs was created and offered to non-science majors starting in Spring 2017. The course emphasizes evidence-driven, scientific investigation and its application in biotechnology and GMOs. In the laboratory, students work in pairs to go through the projects that help them explore questions about GMOs and different non-GMO plant varieties, reasons to create GMOs, GMOs and environment, GMOs, and safety. Some highlights of the class are: (1) The process of scientific investigation was applied to many diverse topics throughout the semester using 5E mode. (2) Provide an authentic
scientific investigation experience with open-ended lab projects and science lab equipment to engage non-science majors.

(3) A service-focused final write-up to apply learning in the course to each student’s career path to reinforce the relevance of the science content. Overall, this course uses biotechnology and GMOs as a vehicle to let students learn and become comfortable with using scientific thinking in different scenarios to improve science literacy. Students also have multiple chances to practice the scientific process in writing and oral presentations, and to critically evaluate their hypotheses with their own data.

**Using Drones to Prepare for STEM Careers**
Drone technology is innovating a range of industries, revolutionizing everything from film production to wildlife conservation. As the UAV (unmanned aerial vehicle) industry continues to grow, the career opportunities for individuals who can pilot, build and embrace drones as a force for good are increasing exponentially. Actively blending physics, electronics, materials science, data transmission and engineering design, drones are a natural STEM platform. Educators interested in integrated, project-based learning are increasingly leveraging this high-interest technology to prepare students for the careers of the future.

**Middle Skills Occupational Gap in WNY**
Middle Skills Occupational Gap in WNY [https://cld.bz/eAiFECt](https://cld.bz/eAiFECt) and responses to the gap including Burgard High School AMP program, McKinley High School PTech Green Technology program and Alfred State College Wellsville Applied Technology programs. How skilled trades pathways are critical from the economic development perspective.

**Nerf N-Strike Claims to Fire 75 Feet! Fake News?**
A ball is thrown into the air, a football player attempts to kick a football over the goal post, a toy rocket is launched straight upward... how many of these starting lines to “real-life” problems do you recognize? Boring! Consider actually modeling projectile motion so that students can answer the question: when am I ever going to use this? Students are charged with the problem of validating the manufacturer’s claim on the box. Get ready to do some problem solving in this workshop! Leave with materials ready to use! Bring a laptop, graphing calculator.
Hand in Hand: Using Technology for Social Good

Hand in Hand is a two-week summer program offered to engage youth in a tech-centric summer experience. It introduces 45 students (predominantly from the urban core) to the basics of anatomy, biomedical engineering and design, and technology while delivering a unique service learning opportunity. The students work in teams to design four prosthetic hands using e-NABLE open source software and 3D print technology (three for local children and one for a child in India) who were living without one hand. Learning was enriched by daily participation from working professionals (including software engineers with biomedical experience, occupational therapists including one specialist in addictive devices) and near-peer mentor graduate students in biomedical programs. Participants also met three of the four recipient children, which created a moving experience for all involved. Hand in Hand was launched in 2017 with funding from AT&T, and will continue in 2018 with funding from local foundations. The program is a multi-level partnership between WNY STEM Hub, our host school (a charter school in Buffalo’s urban core), and several business partners.

Breaking Technology and Science in Opioid Research

A look into the current research and emerging technology advances in areas such as opioid structure and the benzene ring. Explanation of the ring structure as a basis of many organic compounds and the similarities in opioid and non-opioid structures. Like earlier STEM conf. presentations we have given this will link research with the classroom student by easily understandable explanations and guidance through the organic chemistry and how it relates to current events and news topics and substances used and abused today. A link will be made with the topics presented and the NYS curricula in middle school and high school especially areas of chemistry, biology, physics and industrial arts (for structure). This is targeted for 7-16 with reference also to current topics such as gold used in medicine, nanotechnology advances and practical applications and other news current drug and substances and the chemistry behind them. The intent is a very understandable and teachable approach for what could be a complex and difficult teaching area. Dr Partch has presented worldwide to full audiences and has visited and presented in classrooms nationally at most levels but with an emphasis on middle and high school.

Building STEM/Coding Teaching Capacity in Schools

The Maker Partnership Project is an NSF study that examines best practices in integrating STEM/coding learning experiences into the regular academic day of elementary schools. The study will examine methods of professional development to build STEM/coding education capacity within schools, with special focus on interdisciplinary curricular integration, online PD and teacher supports, and protocols for teaching through the engineering design process in student-directed, mastery-based makerspace classrooms. The study hopes to show the efficacy of scalable, sustaining models that develop the widest and deepest capacities for ongoing STEM/coding learning in schools. We’re seeking institutional partners that would like to certify this professional development.
3E Physical Health Sciences Building - PHS 223
Pam O’Brien - STEMscopes

**Integrating Technology into Science-based STEM with the 5E**
More than just digital delivery - Technology is about designing authentic solutions in a blended environment. Balancing hands-on with digital investigations is the perfect mix for STEM-based science classroom! Technology can be an integral part of observing phenomenon, gathering evidence and justifying conclusions. Join us to see how this balancing act is possible and needed for student achievement gains.

3F Physical Health Sciences Building - PHS 105
Suzy Koontz - Founder and CEO of Learn Thru Movement

**Kinesthetic Strategies to Improve Math Outcomes**
This interactive presentation offers kinesthetic strategies that support the modules, build number sense and critical thinking, and increase a student’s fluency and ability to focus and understand. All participants will receive the Math & Movement Training Manual e-book, and six digital skip counting banners. Additionally, up to 30 participants will also receive an autographed copy of Suzy Koontz’s new children’s book, *Buddies, A Math Adventure*!

Session 4, Monday 4:30 – 5:30 PM

4A Central Dining Hall - CDH Allegany Room
Ellen Falk - North Salem Middle High School, NYS MCAP, AMTNYS

**Mathematics Meets the Cryosphere! Making STEM Connections**
Content rich, project based, authentic and real time. Apply project based learning and give greater understanding of Arctic Sea Ice changes through history to make future predictions based on real time data. SPACE MATH and NASA data base sources are explored, investigated and used. Students play a role as a climate change advisor and are charged with determining through linear regression when Arctic sea ice will be gone. Students are exposed to using Excel and working with large data bases.

4B Physical Health Sciences Building - PHS 107
Theresa McSweeney – NYSUT
Timothy Fowler - New York State Network for Youth Success

**Equity in STEM Education**
All students should have access to high quality learning opportunities in Science, Technology, Engineering and Math (STEM). The career and labor demands and the need for a diverse and representative workforce in STEM fields highlights the necessity for equitable opportunities in the classroom. We will be examining approaches to instruction and activities, tools and resources that can be more inclusive and motivating for diverse populations.
4C Physical Health Sciences Building - PHS 101
Susan Bartle - School Library System, E2CC BOCES

No Two Alike: 3D Flake Design with Snowflake Bentley
Using the award-winning book Snowflake Bentley by Jacqueline Briggs Martin introduce students to the art and concept of snowflakes. Discuss what weather conditions are needed for snowflakes to form and learn all about Snowflake Bentley, one of the first known photographers of snowflakes. Share modern ways that snowflakes are photographed and then introduce students to the 3D snowflake generator website so students can try to create their own snowflakes. This project can be part of a unit on Weather, Technology, and the Arts.

4D Physical Health Sciences Building - PHS 223
Rene’ Hauser - St. Bonaventure University
Jacqueline Philp - St. Bonaventure University
Dr. Xiao-ning Zhang - St. Bonaventure University

No Time Lost: Integrated Lessons
To increase emphasis on English Language Arts, subjects like art, science, and history are becoming an afterthought in classrooms across New York. Teachers are feeling pressured to increase their students’ performance on standardized tests, resulting in teachers focusing on math and English more frequently than other subjects. With this presentation, we will provide teachers ways to integrate STEAM into the classroom while at the same time meeting math and English standards. The activities will be hands-on and engage students safely in primary grades. Included are survey results from teachers using STEAM in their classroom on how STEAM affects the students’ behaviors, attitudes towards school, and academic scores.

4E Physical Health Sciences Building - PHS 216
Elizabeth Scott

Integrate the Arts Through Readers’ Theater!
Easily and successfully integrate the arts into curriculum by engaging students in reading through dramatic play! In this session, participants will learn to successfully implement readers’ theater curriculum in order to bolster student performance and set them on a fast track to success for the whole school year. We will use multi-leveled, fun, and engaging scripts to unleash the power of readers’ theater.

Image KEY

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<th>Grade Levels</th>
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<td>K-4</td>
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Science Technology Engineering Mathematics English Language Arts Arts
Build a box: Engineer a Food Dye Electrophoresis Box using STEM!
In this hands-on workshop, use engineering practices to study something from your everyday lives – food dyes! Have students engineer a protocol to separate and identify food dyes using a do-it-yourself electrophoresis box. It’s a colorful way to introduce pipetting and electrophoresis skills in addition to chemistry and physics concepts.

Developing The Necessary Skills to Make Your Students Successful Team Players
Real world problems are increasing being tackled with multidisciplinary teams. Bringing participants from the within the STEAM disciplines, as well as those outside of STEAM areas, and getting them to perform in a team setting is challenging. Adding complexity to the issues of working in teams is the relatively short lives of the teams, as well as being a member of multiple teams at the same time. Team skills must become second nature for our students. Success in STEAM careers requires the ability to form a diverse team and rapidly progress through the development stages of Forming, Storming, Norming, and Performing. Active and equal participation must be ensured. Additional skills are required to use data to: identify the true problem, isolate the root cause, generate solutions, select a preferred solution, sell that solution, and finally implement that solution. This session presents a series of simple approaches and tools that educators and students can use in STEAM clubs to organize and run effective meetings, ensure equal participation by all, collect and organize data, generate and select ideas, and enable participatory decision making.

Design and Develop Your 3D Art Studio
Turn your ordinary 3D printed objects into extraordinary artifacts. Create objects that strengthen your instruction. Tactual design experience can provide students with valuable skills. Learn how a BOCES Media Center set-up and developed a 3D Art Studio for printing artifacts on demand for utilization in strengthening instruction across the curriculum. You have a 3D printer; your students design and print something but how can you really utilize these printed artifacts? Learn how to elevate these artifacts to an art form.
**Paper Roller Coaster STEM Workshop**

This is a short overview that will be a hands on workshop that will give guests an opportunity to begin the creative design process of the paper marble roller coaster. There will be examples to view. I am not affiliated with Andrew Gatt and "Paper Roller Coasters.com", but I am an advocate for schools and teachers purchasing either kits or licenses to make parts for themselves. I will most likely be giving away one license from Andrew Gatt.

**Math Calcs in Architectural Engineering**

Sample Calculations used in Architectural Engineering including design of buildings, mechanical, electrical, fire protection and energy systems. Presentations provides practical examples of applications of mathematical concepts to building design and construction. Presentation will provide examples to motivate students to select building engineering as a career choice.

**Activating Creative Thinking and Problem Solving Through STEM Activities and Lessons for Primary Aged Students**

Creativity is the core of a child's first encounter with learning. This workshop will demonstrate strategies to help teachers on the k-4 level foster creative and critical thinking skills in students through active exploration in learning. A discussion and debriefing of strategies for critical and creative thinking through hands-on activities as well as transforming the teacher as design thinking manager or coach as opposed to instructor. Our goals:

- Understanding how creativity can drive scientific discovery through engaging, hands-on activities.
- Replicate lessons or units shared so that they can also integrate technology, engineering, and math practices in introducing and deepening the understanding of core science concepts through exploratory learning and questioning.
- Encouraging access to STEM experiences for all students by differentiating the materials and/or lessons.
- Exploring how STEM experiences can help students develop critical-thinking skills, creative problem solving and encouraging innovative thinking.
**K-4  S  T  E  M  ELA  Arts**

### 6B Physical Health Sciences Building - PHS 216
Jennifer Wilkie - Ithaca City School District

**ICSD, Our Story: Inclusive, Culturally Responsive Interdisciplinary STEM Curriculum**

Over the past five years the Ithaca City School District has embarked on an innovative course to redefine how teaching and learning occurs in our schools. We stepped away from traditional curriculum design and created the conditions for our elementary teachers to write place-based, project based, transdisciplinary studies with a STEM or Social Studies focus, that are inclusive and culturally responsive. Join us in an interactive session that will challenge you with new approaches to improve achievement for all students. We will share our process while asking you to consider how processes in your district/school/classroom could shift to make positive changes for engagement of all students in STEM curriculum.

### 6C Physical Health Sciences Building - PHS 107
James Cronmiller - Monroe Community College

**A Prospective, Controlled, Blinded Study Assessing the Effectiveness Of Inquiry-Based Mini-Case Study Exercise in Learning Topics of High Importance in Human Physiology**

The Association of American Colleges and Universities (AACU) state that student centered learning processes are a high-impact teaching practice. These processes help students develop critical thinking skills and reflective judgment and they foster group collaboration, which improves the learning process. The purpose of this study was to assess the effectiveness of a mini-case study exercise as a supplement to learning topics of high importance in Human Physiology. Students in the sections that performed mini-case study exercises had higher grades on questions that pertained to these topics than those who did not perform the mini-case studies. Adding a mini-case exercise to the curriculum made a substantial improvement in student understanding of the subject matter and the grades they achieved on questions pertaining to topics. This technique can be applied to all disciplines.

### 6D Physical Health Sciences Building - PHS 223
Mary Ann Nickloy - NEATEC, AMTNYS, NYS Master Teacher

**Thin Films Where Math, Science, and Technology Intersect**

Using soap bubbles students learn how to measure the thickness of a thin film by observing the colors of the light spectrum and comparing them to a wavelength chart. They also learn the application of Thin Films in the world of nanotechnology and the everyday objects it is used for. Many elements of middle school math are also incorporated into the module as students calculate the volume and surface area of a sphere. This module takes place over 4, forty minute periods.

### 6E Physical Health Sciences Building - PHS 106
Joseph Zawicki - NYS STEM Education Collaborative, STANYS, WNY STEM Hub

**Implementing the NYSSLS - Integrating STEM Learning**

NYS has adopted the New York State Science Learning Standards, ad adaptation of the Next Generation Science Standards. The new standards begin instruction by focusing student attention on a phenomenon (a real-world problem, question or technology); question formulation techniques are used to enable students to develop questions that can be explored. The students conduct experiments to answer fundamental questions. The lessons focus on disciplinary core ideas (in science, technology, engineering and mathematics), cross-cutting concepts, and science and engineering practices. Sample lessons will be examined; resources for developing lessons and for reviewing lesson alignment with the NYSSLS will be presented and shared.
Nurturing Creativity in the STEAM Classroom

Creativity plays an important role in the STEAM classroom. Is it possible to promote creativity in your students? This program will focus on ways elementary teaching can help to encourage creativity, while building the skills of curiosity, communication, and cooperation. We will look at verbal and hands-on challenges that must be solved in a specific amount of time. We will also study deBono’s Six Thinking Hats and journal entry topics in which creativity plays a role.

Session 7, Tuesday 1:00 - 2:00 PM

ACT Condition of STEM

In February of 2018 ACT released its annual STEM Report. Because the ACT test contains both a separate math and science test, as well as an interest inventory and requests an intended major and occupation, we are uniquely positioned to offer such a report. This report reviews the Graduate Class in the context of the STEM-related fields. This session will dive into data from the 2017 Graduate Class for New York State including 5 year trend data. Attendees will gain a better knowledge of ACT’s work with STEM and gain insight into national and state STEM trends.

Making Your Own Destiny

How do educators empower student success through collaborative STEM education and personalized learning to help them reach their destiny? By taking creative action within our own existing environments, we can nurture each of our future problem solvers by inspiring them to Make, Create, and Innovate. With the goal of fostering future STEM careers, learn how to find the time, space, and resources for Making and makerspace activities; how to get the entire community involved, from parents to manufacturers to community organizations; and how to transform hands-on activities into a STEM curriculum in ways that all students will feel the freedom to thrive. We will explore tangible and unique ways to integrate Making into traditional educational settings and cultivate the STEM innovators of the future. Through collaborative partnering with schools, industry, community organizations, and individuals from the community, the Phelps Library and STEAM Lab Makerspace seeks to educate and inspire our future workforce by providing classes in advanced manufacturing, robotics instruction, STEAM Camps, and “pop-up makerspaces”. The Phelps Library was awarded the Finger Lakes STEM Hub’s 2017 Family and Community STEM Innovation Award for Community Based STEM Programming, as well as the 2017 Mosher Wynkoop Award for Distinguished Librarianship.
**G3: Generation Giga Girls - Engaging High School Girls in Data Analytics**

The presentation will be to introduce educators to the Data Analytics program for high school girls created by Girls Inc. of New York City. G³, Generation Giga Girls, the Moody's Data Analytics Program, is the first of its kind, an interactive, online curriculum designed for high school girls from underserved communities. All aspects of the program are both intentional and compensatory, from the animated characters representing girls of color, to the real world scenarios girls are working on in the project-based curriculum. The program uses the experiential learning cycle to give girls tangible skills in statistics, data analysis, and computer programs, allowing them to apply their learnings in a culturally relevant context. Throughout the program, girls learn about real world applications and career opportunities in the realm of big data through workplace visits and mentoring from data science professionals. Upon successful completion of the program, girls are prepared for entry-level internship opportunities using the skills that they have acquired. The digital curriculum has been successfully launched in New York City, and is preparing for national expansion.

**The STEM of Hula Hooping**

This is a presentation based on the Hula Hoop as a kinetic prop sculpture used to explore principles of S.T.E.M (Science, Technology, Engineering & Mathematics).

**Increasing Engagement in STEM through Competition and Gamification – A Case Study/ Lessons Learned**

ISCEF launched the Cyber Robotics Coding Competition (CRCC) in New Hampshire, Nevada, Pennsylvania, Israel, Washington DC, Virginia, and Maryland. CRCC’s flexible, cloud-based, multi-week activity helps middle- and high school-age students learn to code and compete using a fun, interactive, online platform; it is a no hardware/no robots required vehicle through which schools without existing Computer Science academic or STEM enrichment opportunities can introduce coding and robotics or broaden student participation in existing programs.

**Nanotechnology A Super Small World That Can Change Just About Everything!**

An introduction to NanoTechnology and how it can be brought into your classroom. Topics of discussion include: nanoscale, Nano definitions, Moore's Law, Super Conductors, Energy generation, Molecular Models, Transistors/IC's/LED's, Micro Electro-mechanical Systems (MEMS), Carbon Nanotubes, Self-Assembled Nanostructures, Adhesives, Biomimetic Research, Biomimicry, Classroom Nano Kits...
**Session 8, Tuesday 2:15 - 3:15 PM**

**8A Physical Health Sciences Building - PHS 105**
David Frongillo - Retired Teacher

**One and Done ... Now Teaching is Fun!**
20% of your students take up 80% of your time. Often disruptive classroom behavior dominates that 80%. Imagine speaking to your troublesome student(s) just once, and it ends there. It can happen and it does. One and Done, now teaching is fun! The culture of your classroom directly impacts student learning and achievement. The tone of that culture is set by you, the teacher. Teachers and administrators that participate in this workshop session will take away simple classroom adjustments that will produce:
- A decrease in discipline occurrences
- An increase in academic performance
- A more positive environment in both the classroom and the school building
These simple classroom adjustments and techniques work at all levels from kindergarten right up to grade twelve. The approaches to the different grade levels will vary, but the results are the same. If you could attend only ONE presentation, this is the one!

**8B Physical Health Sciences Building - PHS 101**
James Schifley - Cattaraugus-Allegany BOCES
Cathleen Woods - Cattaraugus-Allegany BOCES

**Why Nano, Why now?!!**
The world of nanotechnology is changing everything we see and use. We find it in coatings, medical drug delivery, MEMS – Micro-Electro-Mechanical Systems that are used in cell phone, cars, and many other electronic devices. Nanotechnology focuses on the characterization, fabrication, and manipulation of biological and nonbiological structures on the scale of 1-100 nanometers in size. Encompassing nanotechnology is nanoscience, nanoengineering, and technology, as well as physics, chemistry, and biological sciences. The Nanotechnology equipment available at CABOCES will allow students and teachers access to advanced characterization instruments typically only found at research universities. Experience on this type of equipment allows students to develop a deeper understanding of science concepts and solve real-world research based problems. They will learn about measurement at the micro and nano-scale. Students will conduct elemental analysis on samples and apply/verify theories of why certain elements are present. They will also learn how to operate laboratory grade equipment remotely.

**8C Physical Health Sciences Building - PHS 223**
Stephen Lindridge - Southern Tier Technology and Engineering Educators Association
Colby Westervelt

**“What If I Fall....But What If You Fly”**
Are you stuck in a rut? Visit with us and see how we are merging two classes in meaningful ways to create student centered outcomes that transcend high school, giving students lifelong skills, college credit and national certifications.
Using 360 Degree Videos to Create an Immersive Learning Environment for STEAM Related Fields

Virtual Reality combined with 360 Degree Videos, allows for the opportunity for any individual to easily share an experience with anyone else. Although 360 Degree Cameras operate very similar to a standard camera, they provide an image which extends in all directions. When this 360 degree image is displayed through a Virtual Reality platform, it creates a fully immersive experience, causing the individual to feel as though they are actually there. This new platform for experiential learning can be easily incorporated into any STEAM related subject, by transporting the individual to any location or event which the teacher wishes to share with their students. Tamera Gilmartin will describe how this technology can be incorporated into a well-structured lesson, integrating sound educational pedagogies established in literature, to guide students toward intended learning outcomes. She will also describe the process she used to create a 360 Degree Video based lesson as well as the results of a Pilot Study she conducted at SUNY Maritime College which incorporated 360 Degree Videos to assess the effectiveness of this type of instructional design.

Vuja De: A Fresh Look at STEM (Synergistic Talent and Employee Management)

This session will include an update on the work of Corning Incorporated's Office of STEM and the status of the Greater Southern Tier Region's STEM Program (that is now reaching 30,000 students and serving 1,000 teachers in the GST). Also featured will be an introduction to a lean approach to completing technical degrees that could save degree seekers thousands of dollars and hundreds of hours by leveraging existing partnerships between industry and higher education.

Session 9, Tuesday 3:30 – 4:30 AM

Cleanroom Tour and Presentation (1 PD)
Gather at the lounge in the Physical and Health Sciences Bldg at 3:25 PM
Tour the facilities, the equipment used, and the classes that utilize the Cleanroom. In this session, there will be opportunity to view the student projects that have been completed using the Cleanroom.

OR

Forensics Lab Tour and Program Presentation (1 PD)
Gather at the lounge in the Physical and Health Sciences Bldg at 3:25 PM
Many students develop an interest in Forensic work based on their experiences viewing television shows like CSI. However, many soon find out that forensic scientists are just that – scientists. In this session, the level of preparation needed in science and math to allow students to be adequately prepared to enter the crime lab work force will be explored.