<table>
<thead>
<tr>
<th>Presenters</th>
<th>Affiliation(s)</th>
<th>ID No</th>
<th>session</th>
<th>sub-session</th>
<th>Room</th>
<th>Presentation Title</th>
<th>Presentation Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terry Tailey, Kristan Buckman</td>
<td>Accelerate Learning</td>
<td>30</td>
<td>1</td>
<td>A</td>
<td>Allegh</td>
<td>The Value of Scientific Writing Scientific Explanations in STEM: Claim-Evidence-Reasoning</td>
<td>CER is a way for students to explain, in a scientific way, how observations and data from an investigation are connected to science knowledge. This acclaimed and highly successful instructional strategy is changing how lab instructions are written and finally making science investigations meaningful for students. Growth rubrics and anchor writing samples are provided.</td>
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<tr>
<td>David Czechowski, Matt Duling, Jesse Boscia, Mark McCauley</td>
<td>HYSTEA, Hyde Park Central School District</td>
<td>11</td>
<td>1</td>
<td>B</td>
<td>106</td>
<td>Computer Science's Got Game</td>
<td>Come join us for some game time as we explore several modern strategy board games that foster computer science skills. A European resurgence of board game design has brought a wave of new games that are very different from the American classics. These games offer open-ended challenges, information-rich environments, and a variety of new play mechanics. Computer Science teachers can use games in many ways to enrich and promote their program.</td>
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<tr>
<td>Richard Parth</td>
<td>Clarkson University</td>
<td>27</td>
<td>1</td>
<td>C</td>
<td>107</td>
<td>Nanoparticle Chemistry Serving Humanity: Particle Surface Modification for Improving Properties and Applications</td>
<td>This presentation will describe how and why chemists, aka Molecular Engineers, play a leading role in the development of new materials, and consumer goods that improve all aspects of human life. What they do allows all the other types of engineers to have the materials they produce goods from. In the past 30 years, so far research has evolved into a mainstream activity of almost all chemical industries. The research presented is from achievements in the presenters laboratory and represent the diversity of what is involved.</td>
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<tr>
<td>Timothy Fowler</td>
<td>Network for Youth Success</td>
<td>13</td>
<td>1</td>
<td>D</td>
<td>216</td>
<td>STEM in AfterSchool: Engage Youth For Real</td>
<td>This session will use engineering and science project examples to show how after-school time can be used to create authentic STEAM learning. Participants will engage in an engineering design challenge, and see how these experiences can be door-openers to larger opportunities for design, building, and research by youth. Emphasis will be on what after-school time can be a point of contact for community partners to collaborate on STEAM learning with youth.</td>
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<tr>
<td>Ray Ann Havary, Eric Patsiak</td>
<td>Center for Science Teaching and Learning (CSTL)</td>
<td>16</td>
<td>1</td>
<td>E</td>
<td>218</td>
<td>Project Based Learning: Essential for Motivation in STEM</td>
<td>This hands-on, participatory workshop helps people understand and use PBL. As the teaching strategy described in NGSS and many educational research articles, PBL changes the way teachers teach and students learn. It is exciting and motivating for both student and teacher and can lead to many important discoveries! This workshop will get people involved immediately and easily.</td>
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<tr>
<td>Chuck Goodwin</td>
<td>NYS Technology &amp; Engineering Educators Assoc.</td>
<td>15</td>
<td>2</td>
<td>A</td>
<td>101</td>
<td>Effectively integrating STEM while designing an Air Droppable Survival Shelter</td>
<td>The Air Droppable Survival Shelter is a pre-engineering case study that is a totally interconnected STEM Design Project. The shelter problem incorporates Research, Structural Forces, Structural Design, Ergonomics, Material Utilization, Documentation, Experimentation, Packaging, Contract Specifications, Mathematical and Physical Modeling, Prototyping, Testing, and Analysis.</td>
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<tr>
<td>Stephen Koury</td>
<td>University at Buffalo</td>
<td>19</td>
<td>2</td>
<td>B</td>
<td>105</td>
<td>The Western New York Genetics in Research and Health Care Partnership: Description of project results and hands on experience with GENI-ACT</td>
<td>We will describe the results of our project dealing with introduction of bioinformatics to high school teachers and students and allow hands on participation with the online toolkit known as GENI-ACT.</td>
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<tr>
<td>Frederick White</td>
<td>WYSPE</td>
<td>37</td>
<td>2</td>
<td>C</td>
<td>106</td>
<td>AIR TRANSPORT ENGINEERING: Foundations of Operational Safety</td>
<td>Air travel connects the planet’s human population in a manner that was only a dream a mere 100 years ago. This presentation describes how engineers address air transport safety issues in the context of a robust regulatory environment. It provides an overview of Part 139 Federal Aviation Regulations that impact the registered professional engineer in regard to design and operation of airports, including aircraft arresting systems installed in the safety areas of some civil airport runway ends.</td>
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<tr>
<td>James Alloway</td>
<td>ESMQ Associates</td>
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<td>D</td>
<td>216</td>
<td>Bridging STE(A)M Disciplines with Exploratory Data Analysis</td>
<td>STEM graduates typically work in interdisciplinary teams. Team members must share a common language to boost team effectiveness. Sequential Exploratory Data Analysis, focusing on graphical techniques, provides this language and can be taught incrementally from the earliest grades. We present a seven stage approach for insightful data analysis.</td>
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<tr>
<td>James Crommier</td>
<td>Monroe Community College</td>
<td>10</td>
<td>2</td>
<td>E</td>
<td>216</td>
<td>Student Self-Assessment: Does it make a difference in success in the classroom?</td>
<td>The success of students in the classroom translates to retention and completion. Early warning strategies with proper intervention would appear an intuitive method of increasing the likelihood of student success. We describe a method, Student Self-Assessment, to improve success in the classroom. 93% of the students felt the process helped them with study habits and guided them in planning future strategies. Early intervention (counseling and guidance) through the use of this instrument was proven to be effective.</td>
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<tr>
<td>Casey Baumann</td>
<td>Whitney Point School District</td>
<td>4</td>
<td>3</td>
<td>A</td>
<td>Allegh</td>
<td>Increasing Rigor in Special Classes Using STEAM</td>
<td>Making STEAM lessons and activities an integral part of special classes helps students with significant disabilities engage with more rigorous curriculum. Students with cognitive delays of all levels can access key components in STEAM. I will demonstrate STEAM activities and lessons that all levels of SWD’s can engage with. I will focus on both special class settings (12:1:1, etc.) and SWD’s in general classrooms. The presentation will ask participants to work on differentiating STEAM to meet varied learning needs.</td>
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<tr>
<td>Alice Tarun</td>
<td>Alfred State College</td>
<td>33</td>
<td>3</td>
<td>B</td>
<td>101</td>
<td>Integrate Sustainability in Your Classroom: Workshop to Design a Class Activity/Course Around a Sustainability Issue.</td>
<td>Educators have the opportunity to train students to be more mindful and responsible citizens by educating them on sustainability. Integrating sustainability into curricula is challenging and would depend on the expertise and ability of faculty to commit to develop activities, student learning outcomes, and create new academic programs to integrate sustainability into their teaching as they see fit. This workshop is intended for faculty interested in learning about the best practices and resources available for teaching sustainability in any class.</td>
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<tr>
<td>Shawn Zadeh</td>
<td>Ventovate, LLC</td>
<td>38</td>
<td>3</td>
<td>C</td>
<td>105</td>
<td>A Novel Next-Generation Learning Method</td>
<td>Beyond the poster content being described in more detail, we would go into discussions of the product development and team. A discussion will take place of how the software product was studied through research sites/methods, how it was modified adapted through interviews and the studies, an overview of the team, and a call to action/future works.</td>
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<tr>
<td>James Alloway</td>
<td>ESMQ Associates</td>
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<td>D</td>
<td>106</td>
<td>Fundamentals of Designed Experiments</td>
<td>Many believe that good experiments vary a single factor at a time. The actual requirement is to estimate the effect of each factor independently. Statistically designed experiments permit one to vary all factors simultaneously and detect interactions, thus improving efficiency. This session introduces DOE basics using 5-D models to illustrate key concepts and Minitab software for calculations.</td>
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<tr>
<td>Marc Chiffert</td>
<td>NYS Society of Professional Engineers / Chiffert Engineering</td>
<td>7</td>
<td>3</td>
<td>E</td>
<td>107</td>
<td>Application of Math Equations to Real Life Architectural Engineering Problems</td>
<td>Session will present examples of equations used in the design and construction of buildings and provide an overview of the types of problems solved in architectural engineering.</td>
</tr>
</tbody>
</table>
Session attendees will understand an overview of a successful Technology & Engineering department in a small rural school district and

Shrinky Dinks meet STEM

Using Nanotechnology to Enhance STEM and Coding with TI Tools

Tales From the Technical College

New Forest Economy and Hot Water Extraction Biorefineries

Using Argumentation as a STEM Strategy - Increasing Student Voice and Choice

STEM behind Hollywood/NASA/Health and Sports

STEM behind the sceens in everyday life. Attendees will get the software to teach with for their classrooms and many free resources.

When can you actually use them?

Surface area reaction time is then explored using electrical engineers use base e often. A simple example is when a capacitor charges. We'll wait until taking Calculus to derive the mathematical expression, but in this hands-on session you will see an experimental relationship at work. First, an explanation of the theory will be given in algebraic terms. Then you'll build a simple electrical circuit and measure the voltage across a charging capacitor. A plot of the result in time will show how close the actual measurements come to theory.

Who are the attendees?

Not What but Why?: Crystallizing your purpose in STEM-

What is needed? What will students be expected to do as a college student in a technical field?

Finding a versatile device to teach programming and electronics in a K-12 school has been a challenge. The Microbit is a small computer which cover nanoscale aspects and have been expanded to include STEM inclusive content. The multi-disciplinary nature of nanotechnology creates an optimal avenue for integration into traditional science disciplines. Nanoscience based activities can easily be expanded to include all aspects of STEM education. This session will use hands on activities which cover nanoscience aspects and have been expanded to include STEM inclusive content.

The presentation is a follow up of the 2015 presentation that will again discuss the New Forest Economy based on the Hot Water Extraction Biorefinery process. The clean process that extracts sugars extracts hemiulluouscillarious sugars, lignin, acetic acid, and other valuable chemical assets from wood and agricultural fiber. These materials will be used to manufacture forest resource-based bioproducts, including commercial fiber packaging, green compostable/biodegradable plastic, cellulose nano materials, platform biochemicals, food additives, advanced technology biomaterials, high-tech wood products, and biofuels. The overall process can be used and discussed in science, engineering and technology classes.

Using the New STEM Innovator Hub!

In 2017 teachers and students are hyper focused on the "what" of teaching and learning. What course are you taking? What scores are you achieving? What is your dream school? What is lost is the ever important why? In this session participants will begin to learn to crystallize a personal "why" of STEM so that they are teaching and learning with purpose and effectiveness. Interestingly enough by crystallizing the "why" of teaching and learning the "what" becomes clear.

The integration of academics into Career and Technical fields of study has brought about a fundamental change in the way that content is being taught today. Instead of hearing, "Why do we have to learn this?" picture a lesson, unit or project that engages your students in an authentic experience resulting in knowledge that is retained well beyond their educational pursuits. The connection between real world applications and the content you teach provides students with much needed relevance and significance. With the NYS Common Core State Standards and the recent adoption of the new, NYS Next Generation Science Standards, our teacher's have welcomed this validation of our teaching methodologies. CTE will share their knowledge, experience and curriculum.

A facilitated discussion about building STEM skills that help students as they enter a technical college environment. What is working?

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Teaching in a STEM classroom requires a new set of instructional strategies that build 21st Century Skills; one important one is Argumentation! Join us in this interactive, hands-on, and engaging session where Argumentation about Inventions and Innovations will be modeled and resources will be shared in ways to increase student voice and choice.

During the development of the Boeing 787 (Dreamliner), Alan Mulally, who at that time was CEO of Boeing Commercial Aircraft (and before that chief engineer of the extremely successful Boeing 777 project) walked into an auditorium filled with Boeing engineers tasked with turning the Dreamliner concept into reality. Before saying anything else, Mr. Mulally made this statement of fact: “Designing a new airliner requires a great deal of extremely challenging and difficult work”. This presentation will highlight what some of those challenges are from the perspective of an engineer who was in that room, and introduce the attendee to a few of the basic engineering tools used to assure that the end result is a product that is safe to fly in.

The session will introduce participants to the Integrative Design Innovation Engineers (IDIE) concept that Marquette University places in its freshman year experience. The session will discuss the design and implementation of the course and the experience was shared in the design of a building is a unique approach to delivering a real-world STEM experience to students. The IDIE concept provides an opportunity for students to take advantage of the unique design of this course by working on a real-world design problem that integrates their other coursework.

With TI technology, students can explore STEM activities hands on to get a greater understanding of the Math, Science, engineering and technology behind the scenes in everyday life. Attendees will get the software to teach with for their classrooms and many free resources.

The presentation is a follow up of the 2015 presentation that will again discuss the New Forest Economy based on the Hot Water Extraction Biorefinery process. The clean process that extracts sugars extracts hemiulluouscillarious sugars, lignin, acetic acid, and other valuable chemical assets from wood and agricultural fiber. These materials will be used to manufacture forest resource-based bioproducts, including commercial fiber packaging, green compostable/biodegradable plastic, cellulose nano materials, platform biochemicals, food additives, advanced technology biomaterials, high-tech wood products, and biofuels. The overall process can be used and discussed in science, engineering and technology classes.

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Elizabeth Vizt
Thomas Daniels
SUNY Alfred State
35 7 A Allegh
Play It Forward: Connecting Math and Chess
Play It Forward is an interactive workshop connecting mathematics, chess and creative self-expression. By relating STEM to playing the game of chess, participants discover mathematics in a hands-on, experiential learning setting. Flipped classrooms, such as these, create an atmosphere of action and creativity that is self-directed and enhances academic achievement; students actively engage in the subject area more readily than with lecture-based instruction. Data generated from participants allows for assessment of the positive impact that Play It Forward has had on the students in Allegany County. It is an honor to share our vision, play some chess and present our findings.

Joseph Zawicki
Kathleen Burke
STANYS, WNY STEM Hub, SUNY Buffalo State
39 7 B 101
Lesson Planning for the new NYS Science and Common Core Learning standards.
The implementation of the New York State Science Learning Standards (NYSSLS) will require teachers to take a new perspective. Three-dimensional learning focuses on disciplinary core ideas (DCI), scientific practices and cross cutting concepts. Integrating the stem disciplines is challenging. This workshop will focus on preparing for developing, or selecting, curricula for classroom use.

Theresa McSweeney
NYSUT
22 7 C 106
Update on Critical Issues Affecting our Profession
Updated information on key provisions of legislation and New York State regulations affecting teachers will be presented. This information may include New York State Learning Standards, Grades 3-8 testing, Regents exams and other critical information to the teaching profession. Additional subjects will be discussed based on the interest of the participants.

Joseph Liberto, Leader
Jennifer Leenberger
Katrina Keefe
Michelle Schaut
Greater Southern Tier BOCES
STEM Education
20 7 D 107
STEM Curriculum Mentors Panel Discussion
Panellists will share their experience, as well as lessons learned, as STEM Curriculum Mentors playing a vital role in the implementation of STEM teaching practices in classrooms across 24 districts in the Greater Southern Tier BOCES region. Panellists will provide an open forum for dialogue among participants and panelists where questions and comments by all will be encouraged and welcomed. Teacher training in STEM methodology, school administrative support, community involvement, university and corporate STEM programming, student engagement in STEM and future challenges for STEM sustainability are a sample of topics that will drive the discussion.

Wayne Uter
Thelma Uter
PI Resources
34 8 A Allegh
Dancing and Romancing with STEM
A learning experience in science and math. A demonstration (with audience participation) of how teaching and learning STEM topics can be fun and engaging. Learning the planets of the solar system becomes a "far out" experience. Fractions and basic electrical circuits are used with music to create an "electrifying" memorable moment.

Joseph Zawicki
Kathleen Falconer
Dan Marisaet.
SUNY Buffalo State
40 8 B 101
Remote Classroom Observations
Classroom observations maybe challenging due to travel distances and building locations. We have explored the use of video conferencing tools to observe classrooms using a reformed teaching. This session will focus on the reformed teaching observation protocol, best classroom practices, and remote observation resources.

Caitlyn Gironda
Saratoga Springs High School
14 8 C 105
Integrating Meaningful Technology into the Secondary Mathematics Classroom
Teachers will examine pedagogy of effective integration of technological tools into the mathematics classroom and emphasize critical thinking and inquiry based activities with concrete examples. Teachers will also be given a host of resources to explore on their own and guided activities to get them started with digital tools like Desmos, Geogebra, and more.

William Dean
Alfred State - SUNY College of Technology
12 8 D 106
What Makes a Community Green
Why do we live where we do? What makes a good place to live? How can we make the places we live even better? This presentation will explain Leadership in Energy Efficient Design (LEED), discuss LEED NO LEED for Neighborhood Development), examine two very different case studies, and discuss the characteristics of good neighborhood design.

Sarah Lorya
Solar One
21 8 E 107
Solar One: Cool Activities for a Warming Planet
How can we prepare our students to build a more energy-efficient and sustainable future? This session presents Green Design Lab, an innovative K-12 curricular guide for educators that uses hands-on activities to strengthen STEM skills. Workshop attendees will participate in interactive games and activities, learn about new solar initiatives in NYS, and engage in discussion on best practices for improving energy efficiency in school buildings.