ATTENTION:

• STEM Business Professionals
• Higher Education Professionals
• Secondary Educators

Questar III, Capital Region, & WSWHE BOCES invite you to attend a special event:

STEAMing Towards Success

2019 STEAM CONFERENCE:
Building a Workforce for the 21st Century

November 14, 2019
Red Lion Inn • 205 Wolf Road • Albany, NY
Special thanks to all of our contributors:

**REGENERON**

**PhRMA**

**Day**

**WB Games New York**

**SEFCU**

**nationalgrid**

**SIEMENS**

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**Choose Columbia**

**BBL Construction Services**

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**NYSUT**

**Taconic**

**MVP Health Care**

**ISO**
STEAMing Towards Success
Science, Technology, Engineering, Arts, Mathematics Conference
— WELCOME! —

Questar III, Capital Region, and WSWHE BOCES welcome you to a day of collaboration, exploration, and discovery. The partnership between education and business is a critical component of meeting the demands of the future STEAM workforce while providing our students with the knowledge and tools enabling them to take advantage of the wide range of STEAM opportunities that await them as they graduate from high school.

The goal of STEAMing Toward Success is to bring together secondary educators, professionals from higher education and business to provide a variety of experiences that will enhance the education-business partnership to benefit our students. We hope you have a valuable and enjoyable day!

**REGISTRATION:** If you are from a school district go to MyLearning Plan. Once you have enrolled follow the link to select workshops to complete the enrollment process. You will not be officially enrolled until selections are made.

If you are a business professional please go to: [https://forms.gle/Xf4fKUY99RGdsrpHU8](https://forms.gle/Xf4fKUY99RGdsrpHU8)

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**8:00-8:45 a.m.**  Registration, Continental Breakfast

**9:00-9:45 a.m.**  Welcome & Conference Overview
- Dr. Gladys Cruz, District Superintendent
  Questar III BOCES

**Keynote Speaker:** STEM 2025: The View From Higher Education
- Dr. Anthony Collins, President of Clarkson University

**10:00-11:00 a.m.**  Project STEAM I
- Workshop Selections 1-13 (see program guide) Make 3 selections from 1st choice – 3rd choice when registering

**11:15 a.m.-12:15 p.m.**  Project STEAM Session II
- Workshop Selections 14-18 (see program guide)

**12:15-1:00 p.m.**  Lunch & Vendor Visits

**1:00-2:15 p.m.**  Panel: College Pathways & Workforce Opportunities in STEAM
- INTRODUCTION: Jill Lansing, Assistant Vice Chancellor for the Education Pipeline, The State University of New York
- Dr. Marion Terenzio, President, SUNY Cobleskill
- Dr. Kristine Duffy, President, SUNY Adirondack
- Matthew Grattan, Director of Community & Economic Development, University at Albany
- Dr. Carol H. Kim, Provost and Senior Vice President for Academic Affairs, University at Albany (pending)
- Kris Nolan-Parker, Associate Dean, RPI (pending)

**2:15-3:15 p.m.**  Project STEAM SESSION III
- Selections 19-30 (see program guide)

**3:15-4:00 p.m.**  STEM Hub – Capital Region Update
- Laura Letonen, Capital Region BOCES

**RAFFLES! – Visit the STEAMBus!**

**4:15- 5:15 p.m.**  Honor Reception: Questar III STEM Research Institute

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SESSION 1 SELECTIONS

WORKSHOP #1: Building Partnerships Between Business and Education

**Target Audience:** All participants

Join a round table discussion of successful strategies that have been used to strengthen the important partnership between education and STEAM business. There are many examples of partnerships that have resulted in huge benefits to both entities. Learn about these and participate in brainstorming ways to become involved in this endeavor to encourage the STEAM pipeline.

**Facilitators:**
- Dr. Mary Margaret Small: Director of Educational Partnerships, Clarkson University
- Mr. Steve Heaslip: Senior Sales Executive, Day Automation

Both Mary Margaret and Steve have been actively involved in these partnerships for many years and bring outstanding experience and knowledge to this challenge.

WORKSHOP #2: Incorporating STEAM into Geometry Concepts Through Volume and Modeling

**Target Audience:** MS and HS Mathematics and Science, Administrators, STEAM Business Guests

This workshop will provide participants with Geometry lessons that incorporate real world STEM concepts used by National Grid. Participants will learn how geometrical principles are applied to complex, real-world problems that National Grid are required to solve. Applicable for all teachers of Mathematics. Please bring a calculator with you.

**Presenter:** Micaela Vanderzyden: Mathematics teacher at Shenendehowa High School. Micaela has a BA in Mathematics and a MA in Educational Psychology. She spent her summer as a fellow in Questar III’s STEM Research Institute working at National Grid, shadowing various departments and integrating the knowledge learned into the Geometry curriculum.

**STEM Business Partner:** Global Foundries

WORKSHOP #3: The Titanic Virtual Reality Experience: A Descriptive Writing Project

**Target Audience:** MS and HS teachers of all disciplines, administrators and guidance counselors, STEAM business guests

This workshop will explore using virtual reality headsets to experience the sinking of the Titanic. Participants will discover the change in viewpoints offered by students that experience stories in the first person and the effect it has on their level of engagement, expressive writing skills and deeper understanding of events. Students will reflect upon how perception affects reality.

**Presenters:**
- Tim Ryan: Mathematics Educator and Educational Technology Specialist. Tim has 32 years of experience teaching at Schodack Central Schools and has worked with all K-12 grade levels in his role as Ed Tech Specialist for the last 6 years. He spent the last two summers as a Questar III STEM Fellow at Global Foundries.
- Caitlin Colwell: High School English teacher at Schodack Central Schools beginning in 2007. Caitlin has worked with grades 9-12, including a special education English class. Last summer she completed the Capital District Writing Project’s Invitational Summer Institute and this past summer completed her first of two summers working with Vicarious Visions as part of a 6-person teacher externship in Questar III’s STEM Research Institute.

**STEM Business Partner:** SUNY Polytechnic

WORKSHOP #4: How Physics Helped Create Computer Chips That Run Your Life!

**Target Audience:** MS/HS physical science, chemistry, physics, technology, computer science teachers

Participants will experience NYSSLS-based lessons on the foundations of physics that are the basis of the computer chip. Teachers attending will be able to implement these lessons in to middle or high school chemistry, physics or technology classes.

**Presenters:**
- Karyn Rees: Regents Physics Teacher Averill Park High School, a NYS Master Teacher Emeritus, and a Fellow in the Questar III STEM Research Institute.
- Professor Kathy Dunn: Associate Professor SUNY Polytechnic Institute who is involved in studying the impact of crystalline defects and chemical inhomogeneity in advanced materials.

**STEM Business Partner:** SUNY Polytechnic Institute
WORKSHOP #5: Do Scientists Cheat?

Target Audience: MS/HS science teachers of all disciplines

Get student buy-in on learning the scientific process for the umpteenth time by emphasizing the need for scientific ethics. A sample unit, using NYSLSS phenomenon and inquiry, will be presented leading students from scientific misconduct to a justification for the scientific process and government oversight. A list of the many available resources will be provided.

Presenter: Judy Selig: NYS Master Teacher at Ballston Spa High School (teaching Honors Biology, IB Biology HL, Medical Interventions (3rd course in PLTW Biomedical sequence) and Regents Chemistry) and a Fellow in the Questar III STEM Research Institute.

STEM Business Partner: Hudson Valley Community College Science Center

WORKSHOP #6: Teaching Biochemistry with Toothpaste! FUN!

Target Audience: MS/HS science teachers of all disciplines

In this NYSLSS-aligned unit, students will be taught the core concepts of Organic compounds while investigating the ingredients found in toothpaste. Students will develop their own toothpaste formula and compare its effectiveness to the toothpaste they currently use. Students will be expected to test their toothpaste for microbial effectiveness using aseptic technique. Students will also develop environmentally friendly packaging that provides less waste for our environment. Toothpaste teams will market and advertise their toothpaste to be the most effective formula that is created. Teachers of science grade 6-12, mathematics and technology will enjoy this unit.

Presenter: Erin Sharkey: Greenville High School, Living Environment, IB Biology HL. Erin is a fellow in Questar III’s STEM Research Institute.

STEM Business Partner: GlaxoSmithKline in Oak Hill, NY

WORKSHOP #7: The NYSTEAMBus!

Target Audience: All conference participants

The NYSTEAMBus is a mobile classroom on a converted school bus where kids can learn about STEAM concepts they might not get a chance to learn in elementary and middle school. Our dedicated student scientists (grades 7-12), along with their teacher facilitators, provide engaging STEAM-oriented lessons to students throughout the Capital Region that can be adapted for kids of all ages and skill levels. NYSTEAMBus is a maker space on wheels! Come and learn about this valuable resource for teachers of all disciplines.

Presenters: Frank Adamo: Since 2002, Frank has worked with middle school students to promote reading, writing and thinking skills while keeping an eye on edTech and how to best serve growing writers and readers. Frank earned his National Board Certification in 2010 and he became an authorized Google Education Trainer in 2015. He was honored to be recognized in 2016 as an Empire State Excellence in Teaching awardee, and in 2017, he was honored as the Ruth E. Everett Award winner for mentoring by the New York State English Council.

Steve Wofford is a middle level Library Media Specialist in the Niskayuna CSD for 15 years. He currently runs makerspaces at two middle schools and is the co-founder of the NYSTEAMBus, a mobile technology classroom bringing STEM activities to school districts across the Capital Region. Steve has a background in computer science and has consulted for several Fortune 500 companies.

WORKSHOP #8: Real-World Raspberry Pi Application using Python-Programming language and Open CV (Computer Vision) for image processing.

Target Audience: computer science, technology, digital electronics, STEM grades 6-12

This workshop introduces students to the world of Raspberry Pi that will help students learn Linux commands to manipulate files, hook-up and program a variety of sensors, transfer data for communication display and finally, bring all the knowledge together to create a monitoring system with the Raspberry Pi to control an autonomous line-following robot.

Presenter: Dawn Wetmore: Technology Education teacher at Berlin High School. She has been teaching since 2008 and holds a Bachelor of Science degree from Hartwick College in Computer Science and a Master of Science degree from the College of Saint Rose in Technology Education. Prior to teaching, Dawn worked in industry for 17 years as a computer programmer. She is excited to pilot an Introduction to Computer Science class using Python Programming Language this year. This past August she completed her first summer in Questar III’s STEM Research Institute.

STEM Business Partner: Plug Power of Latham
WORKSHOP #9: Play to Learn: Teaching Through Games

**Target Audience:** All conference participants

This workshop is an interactive foray into video game design and development. It highlights a multi-disciplinary approach to infusing foundations of video game design and development into high school curricula through directly applicable base lessons. Secondary instructors in all disciplines will benefit from this session.

**Presenters:**
- Caitlin Colwell – English Teacher – Maple Hill High School
- Jason DeFrias – English Teacher – Columbia High School
- Matthew Duff – Technology and Engineering Teacher – Averill Park High School
- Valerie Gordon – Art Teacher – Columbia High School
- Terrence Miller – Mathematics Teacher – Averill Park High School
- Nathan Porter – Physics, Computer Science Teacher – Maple Hill High School

This past August these teachers completed their first summer in Questar III’s STEM Research Institute working at video gaming developer Vicarious Visions.

**STEM Business Partner:** Vicarious Visions

WORKSHOP #10: An Introduction to a Current Research Topic in Atmospheric Chemistry and Rainwater

**Target Audience:** MS/HS physical science, environmental science, chemistry

Nitrous acid is present in very low levels compared to other greenhouse gases in the atmosphere, but its presence has a tremendous effect on levels of pollutants. This unit, which introduces students to atmospheric chemistry, exposes students to some of the work being done tracking nitrogen in the atmosphere, and has them plan an experiment measuring levels of a nitrogen species in their area. This unit can be modified to use at various grade levels.

**Presenters:**
- Sam Ziebel - Chemistry teacher at Shaker High School. Sam graduated from SUNY Buffalo with a Master’s degree in Chemistry with a teaching certification. Sam started teaching at the middle school level in 2016 and moved to high school the following year. As a participant in Questar III’s STEM Research Institute in 2019, Sam worked at the Wadsworth Center in the research lab of Dr. Xianliang Zhou.
- Yuting Zhu is a postdoctoral fellow at the Wadsworth Center, working for Dr. Xianliang Zhou. Yuting Zhu was born and raised in Fujian, China and received her Bachelor’s degree in 2012 from Nanjing University, and her Ph.D. in Environmental Chemistry from SUNY College of Environmental Science and Forestry.

**STEM Business Partner:** The Wadsworth Center

WORKSHOP #11: Integrating Theatrical Lighting with STEAM

**Target Audience:** Physical science, physics, technology, mathematics, music, engineering, arts, computer, theatre

“Integrating Theatrical Lighting with STEAM” will allow teachers of STEAM disciplines a pathway to incorporate theatrical or concert lighting techniques and workflow into Algebra, Geometry, Physics, Music, Art, Technology, and Engineering courses.

**Presenter:** Carter Irwin is currently a Theatre Technology instructor at Proctors Theater working with high school aged students. He is proficient in all aspects of technical theatre.

**STEM Business Partner:** Proctors Theater

WORKSHOP #12: Survivor: How to create a sustainable habitat on a battleship!

**Target Audience:** Computer science, technology, engineering, graphic arts, and math

Students will create a vessel that has been designed and developed as a totally sustained ecosystem with an isolated power source, supporting all functions for human survivability. Finished design will be created in CAD and manufactured via 3D printing. Final assembly will demonstrate the functionality of your habitation system.

**Presenters:**
- Peg Murphy - Director of Human Resources, Corporate Secretary & Facility Security Officer, Espey Manufacturing. Peg has a BS Degree in Business Management from Empire State College and is the Past Chair of the Workforce Investment Board for Warren, Washington and Saratoga counties and has been a member of that Board since 2004. She has also served as President of the Board of Directors for the Wesley Community, serving on the Board from 2006 to 2015 and on the Capital Region Economic Development Council from 2011 to 2014.
- Gage Simpson - Advanced Manufacturing Instructor, Early College Career Academy. Gage earned a BS Degree in Engineering from Purdue and has 10 years of experience engineering as US Defense contractor. For the past 7 years he has been teaching in the Early College Career Academy: Advanced Manufacturing Program.

**STEM Business Partner:** Espey Manufacturing, Saratoga Springs
WORKSHOP #13: Turning Metal Into Magic: Sculpture Design and Fabrication

**Target Audience:** Mathematics, technology, drawing, design, engineering

Students will design a metal sculpture, create a blueprint using welding symbols and calculations. Miller Mechanical will transfer the blueprint to a software program that will begin the fabrication. Miller Mechanical and the welding students will weld the sculpture for display.

**Presenters:** Clay Corey: Welding instructor at the Myers Center CTE division. McKenzie Regan: CTE Applied Math teacher for Myers Center CTE division.

**STEM Business Partner:** Miller Mechanical, Glens Falls, NY.

SESSION 2 SELECTIONS

WORKSHOP #14: Speed networking with STEM Businesses

**Target Audience:** All participants - both educators and business professionals

In this session participants will interact with a variety of STEM business professionals including a business description, employment opportunities, training and/or educational requirements, and financial information. This experience will enable educators to share this information with students in an effort to inform and encourage them to consider STEM college and careers.

**Facilitator:** Ms. Miriam Dushane: Managing Partner, Alaant Workforce Solutions

Ms. Dushane is a passionate community advocate and leader, recognized for her service to a host of organizations focused on education and workforce development. She is currently Board Chair of Albany Can Code, a nonprofit organization providing skills training in computer programming, which she joined in 2016. She is also on the board of the Tech Valley High School Foundation, and prior to that served a three-year term on the Tech Valley High School Business Alliance. Ms. Dushane has been active for many years in the Capital Region Human Resource Association, serving as Chair of the Legislative and Public Relations Committees and Secretary of the Executive Committee. In 2015, she was recognized as a Woman of Excellence by the Capital Region Chamber in the category of Excellence in Management, and in 2017, she was honored by the Albany Business Review as one of its Women Who Mean Business.

WORKSHOP #15: Encouraging More Girls and Under-served Students to Pursue STEM

**Target Audience:** All participants, both educators and business professionals

U.S. Bureau of Labor Statistics show that females remain underrepresented in the STEM fields, specifically in the physical sciences. Studies show that middle school girls, with the use of proper educational methods and opportunities become less vulnerable to losing self-confidence. By providing links between science and engineering concepts learned in school, the ability to do interesting work, to play a critical role in the world, as well as to be employed, several strategies can be implemented to spark and increase female students' desire to explore and pursue science and engineering college and career pathways. This presentation applies to all stakeholders in the education process (business, teachers, counselors, administrators). Tangible and “realistic” strategies for instruction, extracurricular program design, business partnerships, and program evaluation will be provided.

**Presenter:** Jackie Carrese - Director of Science & Engineering Technology, Niskayuna Central School District

Jackie has been an educator for over 29 years. She started as a science teacher, became an administrator, and now serves as the Director of Science and Technology. She coordinated the development of multiple courses, curriculum and events designed to increase the number of students participating in STEM. She established and continues to oversee the Niska-yuna Central Schools Engineering Institutes for Young Women in partnership with Global Foundries and General Electric.

WORKSHOP #16: CTE Opportunities for Students

**Target Audience:** All participants – both educators and STEAM business professionals

Career and Technical Education has evolved greatly over the last decade, expanding opportunities for students in a huge variety of disciplines and trades occurring in our region. This workshop will give participants the opportunity to learn about the programs and career pathways CTE provides. Representatives from Questar III, WSWHE, and Capital Region BOCES will share information all teachers, administrators and counselors will find valuable and informative about these exciting, innovative programs.

**Presenters:** Questar III BOCES, Capital Region BOCES, WSWHE BOCES
WORKSHOP #17: Designed for Success: How to Boost Business Through Marketing & Graphic Design

**Target Audience:** All participants

Students will combine their graphic design and marketing skills to create a visual brand and marketing plan for a local, real-world client. Using their knowledge of marketing and business/marketing fundamentals, combined with their graphic arts and Illustrator training, students will take their client’s vision and make it a reality through the creative process. Hands-on logo design and recommendations through a marketing plan will help propel the project to new heights for the client while also immersing students in the process of carrying a concept to completion. Strategies presented in this workshop cross over many disciplines with a focus on graphics and business design. Strategies can be used grades 6-12.

**Presenters:** Sarah Craig - Executive Director of Caffè Lena in Saratoga Springs, NY since 1995. Over the past three years she ran a $2 million capital campaign to fund the complete renovation the historic concert venue.

Sue Stone - Business & Entrepreneurship ECCA Instructor. Sue has been teaching in the Early College Career Academy: Business & Entrepreneurship program for the past two years. Prior to teaching, she owned a coffee cafe in Glens Falls, NY.

Crystal Goss - New Media ECCA Instructor. Crystal has been teaching in the Early College Career Academy: New Media program for the past two years. Prior to that, she has taught Art in various high schools and BOCES for the past six years.

In between teaching positions, she worked as a Graphic Designer, Web Designer/Developer/Supervisor for 12 years.

**Contributor:** Bo Goliber, Fingerpaint. Bo heads up philanthropy and community relations at Fingerpaint, a healthcare and wellness marketing agency, in Saratoga Springs.

**STEM Business Partner:** Café Lena and Fingerpaint, Saratoga Springs

WORKSHOP 18: Teaching Financial Well-Being to Students

**Target Audience:** Administrators, counselors, teachers of mathematics, computer, career, technology

This workshop is designed to introduce participants to SEFCU’s Institute for Financial Well-Being. The Institute uses an innovative approach to providing free financial education to youth as well as adults. Discussion will cover key building blocks used to establish the Institute, the financial concepts integrated into each session, alignment with various national and state standards and applied learning methods incorporated. Brief details on workshop offerings, innovative methods used with iPads and robots/software tools and pre-post assessments will be shared. Attendees will gain an understanding of how youth acquire skills to make financial decisions and explore their own personal aspirations.

SEFCU’s Institute is the recipient of both the national and statewide 2018 Desjardins Youth Financial Education Award (more than $1 billion asset category).

This session will benefit teachers, counselors, administrators and program specialists, exploring new and innovative ways to introduce students to financial education.

**Presenter:** Cheryl Moore, Financial Educator/Media Instructional Designer, SEFCU.

Cheryl began her career at SEFCU in 2009 in the Member Solutions Center providing engaging and informative service experiences for members. She holds a bachelor’s degree in English from the University at Albany, State University of New York and a master’s degree in learning and emerging technology at the State University of New York, Empire State College. As an adult learner in this program, Cheryl provides the Institute team with the latest research and tools to advance learning outcomes with new digital technologies. This knowledge supports the Institute’s mission of providing financial education using state-of-the-art digital tools and resources in line with current methodology and practice.

SESSION 3 SELECTIONS

WORKSHOP #19: Teaching Historical Events Through Virtual Reality

**Target Audience:** All participants

This workshop will let some lucky participants experience what it was like to fly a bombing mission of Berlin in 1943 during World War II. We will also demonstrate how to use Google Expeditions with VR viewers (download app on smartphone required) as well as Nearpod VR lessons. Grade 6-12 teachers of all disciplines will benefit from this experience.

**Presenters:** Tim Ryan: Mathematics Educator and Educational Technology Specialist. Tim has 32 years of experience teaching and learning at Schodack Central Schools. Tim has worked with all grade levels, K-12 in his role as Ed Tech Specialist for the last 6 years.

Ed Finney: Nearpod Pioneer

**STEM Business Partner:** Global Foundries
WORKSHOP #20: Blending ELA with Chemistry: A Partnership That Strengthens Both

**Target Audience:** Science 6-12, ELA 6-12, technology 6-12

Integrating STEM and English content helps students deepen their understanding of both subjects giving a context for and the real-world application of both content areas. Integrated Chemistry and English (ICE) is a one semester course which integrates chemistry and English. Chemistry concepts such as atomic structure, periodic concepts, nuclear chemistry, bonding and physical behavior of matter are taught, explored, discussed, debated and presented using the NYS Common Core ELA standards. Focusing on formulating an argument, research skills, presentation skills, non-fiction and fiction reading allows students to examine the content of chemistry while increasing their ELA skills. Come and learn some strategies that could be incorporated into any Chemistry class to enhance learning.

**Presenters:** Lana Hower: English Teacher at Tech Valley High School. Lana joined TVHS for the start of the 2009-10 school year. She previously worked at the University Heights High School in the Bronx where she taught English through project-based learning. She also taught at University Neighborhood High School in New York City, as well as at New York University and LaGuardia Community College. She has a master’s and bachelor’s degree from the New School for Social Research and a MPA from New York University.

Dee Weldon: Chemistry Teacher, Tech Valley High School. Dee has taught at Tech Valley High School since Fall 2009. She teaches Engineering, Technology, Chemistry and Nanoscience. Her Engineering courses are integrated with Algebra I and Biology. Chemistry and Nanoscience are both integrated with English. She earned a Bachelor of Science degree in Chemical Engineering from MIT and worked for GE for 17 years. She received her Master of Science in Education degree from the College of Saint Rose. She has presented at several conferences, both local and national, and believes that a strong STEM foundation is important for the future of our young people.

WORKSHOP #21: Cultivate Potential... Use Solar Energy to Grow Minds

**Target Audience:** 6-12 STEM – all disciplines

Greenville Central School is excited to share our changes to our CTE curriculum for grade 6. NYS has provided flexibility in how CTE requirements are met at the middle school level and we have taken this as an opportunity to reimagine how we teach CTE. Come join our teachers and learn about how we developed a CTE 6 class that is project/problem based and includes a partnership with Borrego Solar Company. We will share our success story that has resulted in increased student engagement and a passion for STEM learning.

**Presenters:** Diane Lewis: Technology educator at the secondary level in the Greenville School District.
Lynn Hughes: Agriculture teacher and Work-Based Coordinator for Greenville School District.
Lynn and Diane have developed a new and innovative program for Grade 6 technology in the Greenville School District.

**STEM Business Partner:** Borrego Solar

WORKSHOP #22: Bringing Current Science Research To Our Classrooms

**Target Audience:** science 6-12 all disciplines

This session will share lessons developed by Len Bacon during the summers of 2017, 2018, and 2019 while working as a summer research assistant in the labs of Dr. Morgan Schaller and Dr. Rick Relyea at Rensselaer Polytechnic Institute. The first activity will allow students to observe the impacts on marine biodiversity of a massive carbon dioxide release 56 million years ago. In the second activity students design an experiment to measure the impact of road salt concentration on the growth rate of the fresh-water algae chlorella. These learning experiences are based on current research at RPI.

**Presenter:** Len Bacon: Len is a Master teacher with many years of experience teaching Earth Science, Environmental Sciences and Life Science at Schodack Central School District. Len has spent the last three summers immersed in research at RPI, two as a Fellow in Questar III’s STEM Research Institute, with the goal of bringing that current work to the high school classroom.

**STEM Business Partner:** Rensselaer Polytechnic Institute


**Target Audience:** 6-12 STEM Teachers

Combining the skills of mathematics, physics of sound, design, engineering, art, and CAD, students will design and build their own guitar. This interdisciplinary project will engage all students grades 6-12 in a hands-on challenging project.

**Presenter:** Brian McDonnell: Technology Teacher, Catskill City School District, Fellow in the STEM Research Institute.

**STEM Business Partner:** Digifabshop Manufacturing, Hudson
WORKSHOP #24: Invasive Species Curriculum for Secondary Science Classrooms

**Target Audience:** 6-12 science teachers

A workgroup comprised of individuals from the education and environmental fields (including the NYS Department of Environmental Conservation and several SUNY institutions) collaborated to create a curriculum to educate students on the statewide phenomenon of invasive species. This curriculum was developed to lead students through group research projects where they use 21st century skills to learn about invasive species and communicate their findings. Come and learn about these engaging learning activities focused on science grades 5-12.

**Presenters:** Emily Caboot is a middle school science teacher at Algonquin Middle School (APCSD) and the author of the statewide invasive species curriculum. She developed the curriculum as her thesis project for her master's degree in Biodiversity, Conservation and Policy.

Jennifer Dean is an invasive species biologist for the NY Natural Heritage Program. She provides biological expertise for the state invasive species mapping system and help others use the data in their work to protect our natural resources.

WORKSHOP #25: Unraveling the Mystery of Modern Medicines

In this unit students will investigate the driving question: Can live cells be used to make medicines to help humans? Students will explore the differences between biological vs chemical medicines. Part of the lesson(s) will include the genetic engineering of cells and how medicines are made using this type of science.

**Target Audience:** 9-12 life sciences, chemistry, technology

**Presenters:** Sarah Hoffman: Sarah is a veteran teacher of the biological sciences at Columbia High School and has recently been named Assistant Principal of Goff Middle School.

Heidi Gleason: Heidi is a veteran teacher at Columbia High School teaching all levels of biological science including honors and AP, and the Science Research Program.

**STEM Business partner:** Regeneron Pharmaceuticals

WORKSHOP #26: World's Strongest Materials!

**Target Audience:** All sciences, technology engineering

Come and learn about the amazing world of composite materials and how we as educators can use them to get students excited about learning key engineering concepts!

**Presenters:** Chris McDermith, Technology and Engineering teacher, Maple Hill Jr./Sr. High school. Fellow in the STEM Research Institute

Bryce Bachus, Technology and Engineering teacher, Maple Hill Jr./Sr. High school.

**STEM Business partner:** Automated Dynamics: Trelleborg

WORKSHOP #27: You Sunk My Battleship

**Target Audience:** Computer science, technology, engineering, graphics arts, math

Using client server technology with the integration of Raspberry Pi’s and digital electronics students will build their own battleship games. Students will learn to Code through Python to create their Battleship game.

**Presenters:** Joshua Ettinger: Energy Engineer, Day Automation. Joshua graduated from Penn State with a BS degree in Energy Engineering. Upon graduation he continued working in the energy field, doing energy audits, and energy savings calculations to reduce carbon footprint.

Gary Gordon: IT Computer Networking Instructor – Early College Career Academy, WSWHE BOCES. Gary graduated from Castleton State College with an AS degree in Computer Programming and a BA in Math. Gary worked in computer networking field for 20 + years, retired, and decided to come back to share his knowledge and began teaching in the fall of 2018.

**STEM Business Partner:** Day Automation, Albany
WORKSHOP #28: U-Build a Lifesize Battleship for a Cruiseliner!

**Target Audience:** Computer Science, Technology, IT, Math, Grades 6-8 or 9-10

Students will be challenged to build a life-size battleship game for Hasbro. Considerations will be: budget, safety, portability, storage, set up process, tear down process, design, and functionality. Specifications: game must be a stand-up version of Battleship that could be played on a cruise-ship. Essential Questions: What do you develop and how do you pitch it to the customer? Considerations can also include: Adding graphics via large screen TV, electronics for simulation, scoring, and sounds.

**Presenters:** Mike Marko: Adirondack Studios, HR Manager & Contract Administrator. Mike is responsible for the personnel of Adirondack Studios but all contracts and legal documents both incoming and outgoing for ADK. Mike did his first triathlon this year and looks forward to doing his first marathon in October. Matt Reardon: Adirondack Studios, Vice President of Project Administration. Matt oversees all nationally and internationally installation of work. When Matt is not traveling all over the world for ADK Sites he is an avid runner and cyclist. Ben Greico: Queensbury CTE Department Chair and Innovations Instructor. Mr. Greico developed the open project, passion-based classroom titled Innovations for students to identify problems worth solving that benefit the community if solved. In addition, Mr. Greico teaches Project Lead the Way Computer Integrated Manufacturing and Engineering Design and Development. He runs the high school Vex Robotics program and is the Lighthouse teacher for all things technology in the high school. Kyle Gannon: Assistant Superintendent for Instruction of Queensbury School. Mr. Gannon has been a second, third and sixth grade teacher at Queensbury Union Free School. He was an assistant principal of Glens Falls City Middle School as well as the principal of the William H. Barton Intermediate School and Queensbury Elementary School. He has been the assistant superintendent for the last four years. He is a strong advocate for Stem and STEAM in his district.

**STEM business partner:** Adirondack Studios, Argyle, NY

WORKSHOP #29: Understanding and Supporting our English Language Learners (ELLS) in STEM

**Target Audience:** All participants

In this session participants will become more familiar with the needs of ELL and how it impacts their learning. Participants will receive an overview of the different English language proficiency levels and several strategies to tailor their teaching to best support students at the different levels.

**Presenter:** Jessa Waterhouse – RBERN (Regional Bilingual Education Resource Network) Resource Specialist. Jessa works with school districts all over the Capital Region supporting academic instructional strategies with ELLS.

WORKSHOP #30: Leavening Logic: Where Science and Math RISE to the Occasion!

**Target Audience:** 6-12 science, math, technology teachers

Career and Technical Education (CTE) in NY State has evolved this millennium to include commencement-level, integrated academics that align the NYS Next Generation Content Area Standards with National Industry Standards. Students that participate in Questar III’s CTE programs receive academic credit for math and science that is co-planned/taught/assessed. The Culinary Arts program at Questar III’s Columbia-Greene Educational Center embraces the project-based learning approach to STEM teaching. Join us to learn how we merge the academic content and technical areas in a Leavening Unit that incorporates our entire school into the evaluation of our products! Come and learn strategies that can be integrated into a variety of disciplines grades 6-12 especially math and science.

**Presenters:** Hilary Reilly: Science Integration Instructor; Leadership Team for NY STEAM Girls Collaborative Project and NY State STEM Education Collaborative Karyn Watt: Mathematics Integration Instructor; Integrated Academics Team Leader; CTE Program Approval Coordinator Chef Peter Desmond: Culinary Arts Instructor; Former Executive Chef for 12 restaurants at Trump Tower and Marriott Corporation; Adjunct Instructor at SUNY Schenectady County Community College; Member of the American Culinary Federation
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