

STEM

INNOVATE TO INTEGRATE

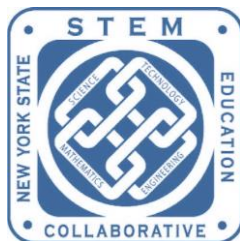
Cultivating Tomorrows Problem Solvers!

SUMMER INSTITUTE

July 29-31, 2018

Alfred State

SUNY College of Technology



Organized and Supported by
THE NEW YORK STATE
STEM EDUCATION COLLABORATIVE

Updated Conference Information and Schedule is found at the NYS
STEM Education Collaborative Website: www.nysstemeducation.org

Alfred State IT Hotline: 607-587-4357

Wi-Fi Internet access does not require ID nor Password

New York State STEM Education Collaborative

www.nysstemeducation.org

Founding Members

Science Teachers Association of New York State (STANYS)

New York State Technology and Engineering Educators' Association (NYSTEEA)

New York State Technology Society of Professional Engineers (NYSSPE)

Association of Mathematics Teachers of New York State (AMTNYS)



Partners

Alfred State – SUNY College of Technology

American Society for Education Engineering

CNY STEM Hub

Chenango Forks STEAM

SUNY Delhi

Eastern Southern Tier STEM HUB

Empire State STEM Learning Network

Greater Southern Tier STEM Education

Hofstra University Center for STEM Research

International Technology and Engineering
Educators Association

Long Island STEM Hub

SUNY Maritime College

NASA – Endeavor Science Teaching Certificate
Project

New York Institute of Technology

New York State Association for Computers
and Technology in Education

New York State Elementary Classroom
Teachers Association

New York State United Teachers

New York State Girls Collaborative

Rochester Engineering Society

STEM Alliance

STEM Leadership Center

SUNY Broome

SUNY Oswego

Technology Alliance of Central New York

Western NY STEM Hub

NYS STEM Education Collaborative

Mission & Goals

Our Mission Statement: To define STEM and the STEM disciplines in a fashion that will serve as a model for New York State and throughout the nation.

AMTNYS, ASEE, NYSSPE, NYSTEEA and STANYS will work collectively and collaboratively to deliver STEM Education in the spirit and vision of the NYS MST Frameworks and Learning Standards. We must take this approach to skillfully and completely address the concerted state and national cry for STEM Literacy.

Our Overarching Goals:

- To transform the NYS MST Learning Standards into an effective and meaningful STEM Education Learning Standards delivery.
- To hold mutually supported annual NYS STEM Education Collaborative Summer Institute that will encourage and facilitate the sharing of successful and innovative classroom STEM practices by presenters representing AMTNYS, ASEE, NYSSPE, NYSTEEA, STANYS, and other education organizations .
- To carry forward our NYS STEM Education Collaborative foundational work with enlightening debate and constructive discussions through various means of communication and a (yet to be determined) conducive timeframe.
- To work together to ensure that accepted research and practice based STEM principles are applied in the development of revised or new MST Standards.
- To mutually support, connect and strengthen science, technology, engineering and math P-16 instruction. All three disciplines would still maintain their separate learning standards, integrity, scope and depth but would be delivered within a cross connected methodology.
- To influence support funding, school policy, teacher training and preparation methods, with our mutually envisioned STEM Education approach.
- To foster the modification of existing assessments, with changes in written language and references, to bring about STEM connections, without changing the primary purpose and thrust of each.

Member organizations:



Schedule

STEM: INNOVATE TO INTEGRATE - Cultivating Tomorrows Problem Solvers!

Sunday, July 29, 2018	Monday, July 30, 2018 continued
Noon: Vendor area open for vendors	4:15 PM to 4:30 PM, Vendors and Break, Central Dining Hall (CDH)
2:00 PM to 5:00 PM, Arrive, Check-in, and Registration at Student Leadership Center (SLC), 3 rd Floor	4:30 PM to 5:30 PM Session 4 Presentations (1 PD), Physical and Health Science (PHS) Building
2:45-4:45 PM Alfred State (Wellsville Campus) Tour of Zero Energy Home (1 PD)	5:30 PM to 6:45 PM, Poster Session 2 and Exhibits (1 PD), Vendors and Cash Bar, Central Dining Hall (CDL) 2nd Floor
5:00 PM to 6:00 PM, Poster Session 1 and Exhibits (1 PD) and Vendor Area Open, Central Dining Hall (CDH)	6:45 PM to 7:45 PM Dinner, Central Dining Hall (CDH)
6:00 PM to 7:00 PM Dinner, Central Dining Hall (CDH)	7:45 PM to 9:00 PM Awards and Keynote Address-Don Duggan-Hass, Paleontological Research Institution- (1PD), Central Dining Hall (CDH)
7:00 PM to 9:00 PM STEM Trivia , Have Fun & Learn (2 PD). Also, Institute Introductions, Logistics and Updates	Tuesday, July 31, 2018
Monday, July 30, 2018	6:30 AM to 7:45 AM, Breakfast
6:30 AM to 7:45 AM, Breakfast	7:00 AM to 9:00 AM, Check-in
7:00 AM to 9:00 AM, Check-in	8:00 AM to 9:00 AM, Session 5 Presentations (1 PD) Physical and Health Science (PHS) Building
8:00 AM to 9:30 AM Plenary Session (1 PD), Orvis Activity Center Auditorium	9:00 AM to 9:15 AM Vendors and Break
9:30 AM to 10:15 AM Vendors and Break Central Dining Hall (CDH) 2nd Floor	9:15 AM to 10:15 AM Session 6 Presentations (1 PD) Physical and Health Science (PHS) Building
10:15-11:15 AM Session 1 Presentations (1 PD), Physical and Health Science (PHS) Building	10:15 AM to 10:50 AM Vendors, and Break, Central Dining Hall (CDH)
11:15 AM to 11:30 AM Vendors and Break Central Dining Hall (CDH) 2nd Floor	10:50 AM to 12:00 PM, Welcome, Raffle , and Keynote Address-Clint Ballinger, Evident Technologies- (1PD) Central Dining Hall (CDH)
11:30 AM to 12:30 PM, Welcome and Keynote Address-John Kent, GlobalFoundries- (1PD), Central Dining Hall (CDH)	Noon to 1:00 PM, Lunch, Central Dining Hall (CDH)
12:30 PM to 1:30 PM, Lunch, Central Dining Hall (CDH)	1:00 PM to 2:00 PM, Session 7 Presentations (1 PD) Physical and Health Science (PHS) Building
1:15 PM to 2:00 PM, Vendors Central Dining Hall (CDH)	2:00 PM to 2:15 PM, Break, Central Dining Hall (CDH), 2 nd Floor
2:00 PM to 3:00 PM, Session 2 Presentations (1 PD), Physical and Health Science (PHS) Building	2:15 PM to 3:15 PM Session 8 Presentations (1 PD) Physical and Health Science (PHS) Building
3:00 PM to 3:15 PM, Vendors and Break, Central Dining Hall (CDL) 2nd Floor	3:30 PM to 4:30 PM Session 9 Tours (Select: Cleanroom or Forensics Lab (1 PD)
3:15 PM to 4:15 PM Session 3 Presentations (1 PD), Physical and Health Science (PHS) Building	Thank You

Professional Development Hours

Sunday (4)
Monday (8)
Tuesday (6)

STEM Institute Total Professional Development 18 hours



NYS STEM Education Collaborative (NYSSEC)

2018 Summer Institute

Planning Committee

Dr. Craig Clark, PE	NYSSEC Summer Institute Co-Chairperson ; Vice President for Economic Development-Alfred State
Gwendolyn Maturo-Grasso	NYSSEC Summer Institute Co-Chairperson ; CNY STEM Hub
Danielle Bouton-Wales	NYSSEC Liaison for AMTNYS
Caitlin Bowen	NYSTEEA Western District VP
Denise Brownell	External Event Planner & Director of Dining Services-Alfred State
Charlie Crumb	CTE - Technical Assistance Center of NY
Stephen Denaker	Instructional Support Supervisor-Greater Southern Tier BOCES
Dr. Donna DeSiato	Superintendent-East Syracuse Minoa CSD; CNY STEM HUB Facilitator
Ellen Falk	NYSSEC Plenary/Keynote Facilitator; AMTNYS; NASA Endeavor Project
Timothy Fowler	Network for Youth Success; NYS STEAM Girls Collaborative
Elizabeth Gallo	NYSTEEA President
Chuck Goodwin, DTE	NYSSEC President; NYSTEEA Past President
Melissa Hirt	NYSTEEA North Eastern District VP
Terry Sweeney	NYSSEC Plenary/Keynote Facilitator & Communications; NYSUT-Professional Development
Maranda Miller	NYSSEC Social Media Coordinator; Assistant Director of Learning Support-SUNY Maritime
Phyllis O'Donnell, PhD	NYSSEC Event Program; Associate Professor-SUNY Broome; STANYS
Timothy Ott	Director CTE – Technical Assistance Center
Fred Pidgeon	STANYS Past President
Hilary Reilly	Science Integration Specialist-Questar III BOCES
Dr. Robert Rogers	NYSSEC Vendors; Past President AMTNYS; Professor-SUNY Fredonia
Frank Roma, PE	NYSSEC President-Elect; NYSSPE
Ricardo Rowe	NYSSEC Webmaster
Barbara Scherer	Assistant Manager Outreach & Workforce Development-SUNY Delhi
Dr. Mark Vaughn	Technical Talent Pipeline Manager-Corning Inc.; Southern Tier STEM HUB Facilitator
Donna Yerdon	NYSSEC Treasurer; Immediate Past President AMTNYS
Dr. Joseph Zawicki	NYSSEC Secretary and NYSSEC Program & Communication; STANYS; WNY STEM Hub; Professor-Buffalo State

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The logo for Corning, featuring the word "CORNING" in a blue, serif, all-caps font.



The logo for Siemens, featuring the word "SIEMENS" in a large, bold, blue sans-serif font.

Ingenuity for life

We Thank & Support Our Vendors

This is from 2017 ??? Info will come later from Bob



Goodheart-Willcox Publisher



www.leadingengineeringtechnologies.com



NYS STEM Education Collaborative

???





Proclamation

Honoring the New York State STEM Education Collaborative's 2018 Summer Institute at Alfred State College

WHEREAS, It is the sense of this New York State Senator to acknowledge the efforts of organizations who promote an enhanced education for the residents of this great Empire State; and

WHEREAS, Attendant to such concern, this member of the New York State Senate is justly proud to honor the New York State Science, Technology, Engineering and Math (STEM) Education Collaborative's 2018 Summer Institute, at Alfred State College from July 29 to July 31, 2018; and

WHEREAS, The NYS STEM Education Collaborative is an outstanding consortium of organizations, including the Association of Mathematics Teachers of New York State (AMTNYS), New York State Society of Professional Engineers (NYSSPE), New York State Technology & Engineering Educators Association (NYSTEEA), and the Science Teachers Association of New York State (STANYS), working to promote the scope and integration of STEM education on a statewide and national platform; many professionals ensure that a STEM education approach provides students, from pre-kindergarten through graduate school, with all of the necessary tools to strengthen the overall learning experience of students in

preparation for their post-secondary and professional careers;
and

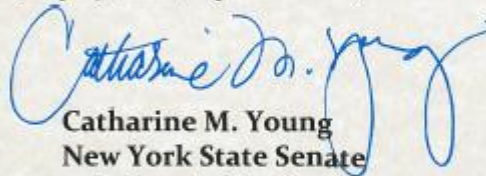
WHEREAS, The 2018 Summer Institute will encourage the sharing of successful and innovative classroom practices, provide enlightening debate and constructive discussion, and advocate for the modification of existing assessments with changes that incorporate STEM connections; it is certain that with a variety of keynote and plenary speakers to attend the summer institute, they will have a profound and lasting impact on the future of education; presentations will include all learning levels (k-20); STEM proposals currently include STEAM which takes these proposals to the next level of innovation; and

WHEREAS, At the direction of Craig Clark, PE, PhD, and many others, it has been made possible for Alfred State College to be a leader with the NYS STEM Education Collaborative and it is certain that this annual event will continue to be a highly monumental success; and

WHEREAS, Observing that special recognition should be given to those who work assiduously and make significant contributions to the citizens and communities in this great Empire State; now, therefore, by way of this Proclamation;

SENATOR CATHARINE M. YOUNG honors the New York State STEM Education Collaborative's 2018 Summer Institute, and a copy of this Proclamation, suitably engrossed, should be transmitted to Craig R. Clark, PE, PhD, Gwendolyn L. Maturo-Grasso, Co-Chairs of the NYS STEM Education Collaborative's 2018 Summer Institute.

Proclaimed July 29, 2018, By Order Of,



Catharine M. Young
New York State Senate
57th Senate District





N.Y.S. STEM Education Collaborative
STEM: Integrate to Innovate -
Cultivating Tomorrow's Problem Solvers

July 29, 2018

Greetings Attendees, Presenters, Vendors and Sponsors!

On behalf of our Collaborative's planning committee, members, and partners it is a great pleasure to welcome you to our sixth STEM Education Summer Institute at Alfred State in 2018! We believe the offerings of our institute, including the wide range of STEM & STEAM integrated topics, knowledgeable and experienced presenters (representing all levels of learning), our distinguished plenary panel, three outstanding keynote speakers, great networking opportunities, and the array of STEM connected vendors, provide you with experiences that can greatly enhance and expand your instructional strategies. In addition to sitting in on presentations related to your subject and grade level, we feel it is important for you to attend presentations connected to other disciplines as well. You will be amazed at the ideas you can glean that actually benefit your instruction. Gaining a greater understanding of what we are all about is in the true collaborative spirit.

Can you imagine how capable, resourceful, mentally agile, turned on, and confident our students would be with solving real world problems, if they were exposed to integrated STEM learning, on a consistent basis, K through 12 and beyond? In fact students would have a much clearer understanding of how the world around them works and how they can live and work productively, effectively, and flexibly to meet the ever changing demands of their present day and future world. In essence, this approach is the over-arching goal our Collaborative has for New York State and across the nation.

It has been a great joy and wonderful human experience to work so closely with representatives from STANYS, NYSTEEA, NYSSPE, and AMTNYS. Our collaborative's approach to STEM instruction and learning provides the glue that brings us together. This institute serves as a model for making American education relevant, exciting, challenging, practical and meaningful to all students at all grade levels. Our Collaborative cannot thank the Alfred State administration and support staff enough for their tremendous support, hospitality, and guidance throughout our entire planning process. Truly our Collaborative, its partners and Alfred State have operated as one team and one magnificent collaboration.

Again welcome and enjoy all of our institute's offerings. Through STEM related instruction and integrated learning we are all connected.

Yours in STEM instruction and learning,

A handwritten signature in black ink, reading "Charles H. Goodwin".

Charles H. Goodwin, DTE, President
N.Y.S. STEM Education Collaborative



SUNY College of Technology

10 Upper College Drive
Alfred, New York 14802

Office of the President

Ph: (607) 587-4010

Fax: (607) 587-4209

April 18, 2018

Welcome Participants,

Alfred State is pleased to once again host the NYS STEM Summer Institute.

At Alfred State, we have a wide variety of STEM-related programs, from the skilled trades on the Wellsville campus to engineering technology, health sciences, agriculture, architecture, management and many more on the Alfred campus. Our commitment to STEM programming will continue to be at the core of who we are.

The College is proud of its focus on educating students for 21st century STEM workforce careers and realizes the benefits of science technology, engineering, and math and the impacts these fields have on our lives every day. Additionally, our interest in non-traditional students in the STEM Workforce will continue to be a focus.

This conference is a great professional development opportunity that includes networking from the elementary level through higher education and beyond. Fittingly, this year's theme is "Innovate to Integrate-Cultivating Tomorrow's Problem Solvers." We strive to inspire future technicians, engineers, scientists, and mathematicians, no matter their age.

The ability for New York State to support existing and new companies is based on the ability to educate students in STEM careers. Alfred State commends the NYS STEM Education Collaborative on developing this conference and realizes the importance of its mission. We are honored that you have again chosen to be at Alfred State in Western New York, and hope you consider this your home for this annual conference.

Please enjoy yourselves and learn from stimulating and inspiring sessions, and one another. These conversations will allow us to continue serving our students and changing lives in these important fields of study. If you have questions please contact us.

Have a terrific conference!

A handwritten signature in black ink, appearing to read "Skip Sullivan", with a long horizontal line extending to the right.

Dr. Skip Sullivan
President



29 July 2018

Dear STEM Institute Participants,

Greetings from the Empire State STEM Learning Network! Comprised of ‘STEM Hubs’ from across New York State, we are part of the national STEMx initiative that is managed by Battelle – the world’s largest nonprofit research and development organization. I’m delighted to welcome you to the sixth Summer Institute of the NYS STEM Education Collaborative! The Institute’s theme expresses a need which is more important than ever before – “Innovate To Integrate - Cultivating Tomorrow’s Problem Solvers”. The ideas you will share, and the skills you will gain, over the next few days are essential in helping to continue to improve STEM education in New York State.

It is well known that students who complete a degree in the STEM disciplines have a strong chance of entering a productive career track, and this is a credit to their teachers. As Neil deGrasse Tyson has said, “STEM is hard”... and if it wasn’t for their outstanding teachers many students might not master it. In learning STEM, students often also master the essential ‘soft skills’ of teamwork, collaborative learning and problem solving, communication of complex ideas, and perseverance in the face of learning complex and challenging material.

The 2018 Institute host, The State University of New York at Alfred is providing a great setting for STEM learning and networking. Many thanks to the planning committee for all its hard work to create this opportunity to integrate and innovate. Most of all, thanks to all participants for everything you do to advance high quality STEM education for all!

Sincerely,

Phillip Ortiz, Ph. D.
Assistant Provost for Undergraduate and STEM Education
Coordinator, Empire State STEM Learning Network
Phillip.Ortiz@SUNY.edu



Science Teachers Association of New York State, Inc.

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*A chapter of the National
Science Teachers Association
(NSTA)*

*A member of the New York
State Council of Education
Associations (NYSCEA)*

Dear Stem Colleagues:

On behalf of *The Science Teachers Association of New York State* (STANYS), it is my pleasure to welcome you to the 2018 NYSSEC STEM Summer Institute. Your participation in this institute speaks volumes about your dedication to ensuring students have the opportunity to succeed. The STEM Summer Institute provides an opportunity for teachers to collaborate not only to increase their depth of knowledge but also to share enthusiasm for STEM related fields of study.

Since the adoption of the New York State P-12 Science Learning Standards in 2016, science teachers find themselves shifting their classroom practice towards three dimensional instruction; focusing not only on content but weaving together the content, practices and crossing concepts. Students are asked to explore phenomena and construct knowledge about the natural world. This shift from content delivery to student-led exploration is the essence of STEM instruction. Rather than learning isolated content, students must incorporate knowledge and skills from a variety of subjects to make sense of the world around them. Teachers who have the opportunity to take part in STEM collaboratives already understand the importance of integrating multiple disciplines to ensure student understanding.

As a participant in *Workforce 2025, Educators and Industry Leaders Working Together to Prepare NY's Workforce of the Future*, I am mindful of the skills gap in our New York State workforce. "Middle skills jobs" account for about half of New York State's labor market. However, only 38% of the state's workforce is trained at the middle skill level. This means that there are good jobs available for people trained in STEM right here in NYS. We, as STEM educators, need to collaborate to fill this skills gap and prepare our youth for the jobs of tomorrow. This provides a challenge for us to think about what education could be, and an opportunity to provide the students we see in our classrooms everyday with the STEM skills they need for a bright future.

Sincerely,

Lisa Brosnick

Lisa Brosnick
President, STANYS 2018-19

STANYS 123rd Conference,
November 2 - 5, 2018
Friday - Monday
Rochester, NY



New York State Technology & Engineering Educators' Association

Chartered by the Board of Regents of New York State

www.NYSTEEA.org

May 15, 2018

On behalf of the New York State Technology and Engineering Educators' Association, I welcome you to the STEM Summer 2018 Institute at Alfred State College. This year's theme: *STEM: Innovate To Integrate, Cultivating Tomorrow's Problem Solvers* is relevant for all STEM fields, but is especially relevant to Technology and Engineering Educators who strive to bring problem solving skills to students through project and problem-based learning in hands-on and minds-on learning environments.

NYSTEEA believes that Technology and Engineering Education is at the heart of STEM education. Our definition of Technology and Engineering Education is the application of tools, materials, and knowledge to solve problems. In Technology Education laboratories around the state, teachers utilize math, science, and technical content in the context of engineering design and problem solving. Students entering a rapidly changing technological world need integrated and collaborative STEM experiences now more than ever.

I look forward to meeting you at the STEM Summer Institute and discussing how our disciplines can work closer together to provide *all* students with integrated and collaborative STEM experiences. Together we can prepare our students to apply STEM problem solving skills and pursue future careers in STEM fields.

Mark W. Hardy, Ph.D.
President, NYSTEEA



**The New York State Society of
Professional Engineers, Inc.**

The Founding Society of the National Society of Professional Engineers

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Anthony Fasano, PE, LEED AP, ACC

Legal & Legislative Counsel

Mark C. Kriss, Esq.

May 14, 2018

Dear STEM Institute Participants,

It is a great pleasure to welcome all those attending the STEM Institute 2018.

On behalf of the New York State Society of Professional Engineers, I congratulate the teachers and participants of this program on being exemplary leaders ensuring that our school children are receiving the highest quality education possible.

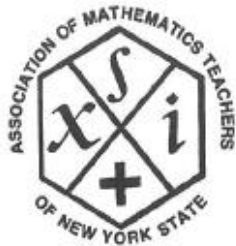
The New York State Society of Professional Engineers is looking to you as educators of our next generation of science and engineering professionals and commends all of you not only on your commitment and dedication in the education of students but also on your dedication of cultivating the idea of STEM education in your schools and communities.

Thank you for the work that you do every day to support our engineering future.

Please accept my best wishes for an enjoyable event and continued future success of the Institute.

With Warm Regards,

Laura Pellizzi, PE
NYSSPE, President 2016-2018



**ASSOCIATION OF
MATHEMATICS TEACHERS OF
NEW YORK STATE**

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Dear STEM Institute Attendees

It is my pleasure to welcome you to the 2018 New York STEM Education Collaborative Summer Institute at Alfred State College. **"STEM: Innovate to Integrate—Cultivating Tomorrow's Problem Solvers"** is sure to be an outstanding conference, and I am confident that you will leave here with that feeling.

This is an exciting time to be a STEM educator, and this event is another excellent way to gain information that you can take back to your classroom. It is our responsibility as educators to provide opportunities for our students to become the problem solvers of tomorrow, and your attendance at this conference speaks volumes about your willingness to accept this responsibility. It is up to us to cultivate the minds of our students to prepare them for the problems they will face; problems that we might not even realize will exist in the years to come. As these problems change, so too must our teaching practices, and this is just the event to help make that change happen.

Over the next three days you will be able to hear from our esteemed Plenary Panel and keynote speakers, as well as the many other outstanding presenters who are so willingly giving of themselves to share their work with all of us. You will also have a tremendous opportunity to network with your colleagues from around the state and the region, which in many ways might be the most beneficial part of this event. If you come across something you really like, be sure to get that person's information so you can stay in contact.

On behalf of AMTNYS, thank you for being a part of this collaborative event. I wish you the best of luck in the future, and hope to see you at our conference in November.

Sincerely,

Michael Siuta
President, AMTNYS

Andrew Pallotta

President

Jolene T. DiBrango

Executive Vice President

J. Philippe Abraham

First Vice President/Secretary-Treasurer

Paul Pecorale

Second Vice President

July 2018

Dear STEM Institute Participants:

I am pleased to send greetings to educators from around the state attending the New York State 2018 STEM Education Summer Institute: *"STEM: Innovate to Integrate: Cultivating Tomorrow's Problem Solvers!"* at Alfred State SUNY College of Technology. NYSUT is proud to support the 2018 Summer Institute and the work of the New York State STEM Education Collaborative.

NYSUT is an adamant supporter of professional development and recognizes the professional development needs of our members to be effective in the classroom to ensure our students have the skills necessary to succeed in STEM and STEM related fields. The offerings at the STEM Institute support this with a wide range of STEM integrated topics, knowledgeable and experienced presenters representing all levels of learning, a plenary panel, keynote speakers, networking opportunities, and an array of STEM connected vendors. The institute will provide educators with experiences that can greatly enhance and expand their instructional strategies

This STEM Institute serves as a model for making STEM education relevant, exciting, challenging, practical and meaningful for all educators and to make connections for their students at all grade levels.

Thank you for your hard work, dedication and commitment to STEM education and to our students.

Sincerely,



Andrew Pallotta
President

AP/TM/mc - 105866

2018 Summer Institute

Keynoters



John Kent

Vice President, Worldwide Program Management Office

GlobalFoundries (Monday, 11:30 AM – 12:30 PM)

John P. Kent is the Vice President, Worldwide Program Management Office at GlobalFoundries where he is responsible for the worldwide program management for new semiconductor product programs emerging at GlobalFoundries. John as formerly held management roles at KLA-Tencor (Milpitas, CA); Rambus (Sunnyvale, CA); AMI Semiconductor (Pocatello, Idaho), and has had a lengthy early career at IBM. John is a Senior Member of both the AiChE (American Institute of Chemical Engineering) as well as the IEEE (Electrical Engineering).

“GlobalFoundries NY Semiconductor Initiative and Perspectives on STEM” John will talk about the emergence of advanced semiconductor technology in NY, at Global Foundries from its pioneering roots and the implications that this technology domain has for the educational needs of students in our State. In a world of shifting information and "flexible news" - the demand for the execution of exact science and engineering, to the strictest standards of quality, has never been greater.



Dr. Don Duggan-Hass

Director of Teacher Programming

Paleontological Research Institution (Monday, 7:45 – 9:00 PM)

Don Duggan-Hass is the Director of Teacher Programs at The Paleontological Research Institution and its Museum of the Earth & Cayuga Nature Center in Ithaca, NY. He also currently serves as President of the National Association of Geoscience Teachers. He is a nationally regarded expert in climate and energy education, place-based and technology-rich Earth and environmental science education. He has taught at Colgate, Cornell, and Michigan State Universities, Kalamazoo College, and Tapestry and Norwich (New York) High Schools.

For Don's full bio, please see <https://www.priweb.org/index.php/research/research-staff/cv-dugganhaas>

“Why Haven't Educational Reforms Improved Outcomes on a Broad Scale? What Can We Do To Change That?” Many teachers make profound impacts on students' lives. This is especially true in light of the reality that the fundamental structures and practices of schooling are at odds with what research says about how people learn. Analyzing data on previous attempts at sweeping reform yield no conspicuous improvements (nor substantial declines) in the outcomes of formal STEM education in recent decades. This talk will address how we can learn from successful innovations in other fields of endeavor and at aspects of human nature, especially cognitive biases, that have made changing the system of education profoundly difficult. It is hoped that by illuminating these challenges, the task will become easier.



Dr. Clint Ballinger

Founder and CEO of Evident Technologies, a Nanotech company in Albany area (Tuesday, 10:50 AM – 12:00 PM)

Dr. Clint Ballinger is the founder and CEO of several high tech companies most notably SelfArray and Evident Technologies. He has launched products in multiple market verticals from LEDs to biotech to military to energy. Currently, Clint is the Executive Entrepreneur in Residence at Rensselaer Polytechnic Institute in Troy and is the CEO of SelfArray, Inc. developing next-generation displays. He teaches several classes on starting new companies and runs a NSF funded program in the Capital District to help take technologies to market.

“The Random Walk of a Scientific Engineer Turned Entrepreneur and How It Relates to STEM” Clint is well skilled at translating advanced technology into and new products to solve problems, meet needs, and create new markets. He brings a wealth of experience in raising capital, technology development, market strategy, sales development, personnel recruitment and the creation of a creative corporate culture.

2018 Summer Institute

Plenary Panel

Orvis Activities Center - 8:00 AM to 9:30 AM (1 PD)

PLENARY FACILITATOR

Mark Vaughn, PhD

Mgr. Technical Talent Pipeline & Lead
for STEM Technology at Corning Inc.



Dr. Donna DeSiato

Superintendent, East Syracuse-Minoa
Central School District
Chairperson for the CNY STEM Hub



Ellen Falk

AMTNYS, Past Vice President
NASA Endeavor Project
Endeavor STEM Teaching Certificate Project



Shawn Hricko-Cummins

Assistant Chief Engineer for Cummins Inc.
Manufacturer of Diesel Engines
Jamestown, NY



Robert Sherburne

GST BOCES
Principal, STEM Academy
STEM Curriculum Mentor



Jeffrey Stevens

Interim Dean - School of Applied
Technology at Alfred State



Karen Woodruff

STEM Teaching Partners
NASA Endeavor Project
Endeavor STEM Teaching Certificate Project
Program Director

2018 Summer Institute

Alfred State College - Tours



Zero Energy Home Tour and Presentation (1 PD)

With Jeffrey Stevens, Interim Dean - School of Applied Technology, Alfred State

Sunday, July 29, 2018

2:45 - 4:45 PM

Bus Transportation will be provided.

Gather at the Registration Table in the Student Leadership Bldg at 2:45 PM.

The **Zero Energy Home** is a student-built home and open laboratory on Alfred State - Wellsville Campus which serves to educate the construction workforce in green building techniques embracing energy efficiency and renewable energy resources including *geothermal, photovoltaic (solar electric), solar thermal, and wind turbine*.

The **Zero Energy Home** utilizes high-end monitoring of energy production and consumption that is being used by students and faculty to operate the home efficiently. The **Zero Energy Home** has also been used for high school technology training programs.

Sustainability is quickly emerging as the defining challenge of the 21st century. As a leading technical college and a community devoted to civic engagement and service, Alfred State is pioneering sustainability with academic and co-curricular programs to prepare graduates to succeed in fast-growing sectors of the economy such as renewable energy, green building, hybrid and electric vehicles, and sustainable agriculture.

Cleanroom Tour and Presentation (1 PD) – Session 9

Tuesday, July 31, 2018

3:30 - 4:30 PM

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) – Session 9

Tuesday, July 31, 2018

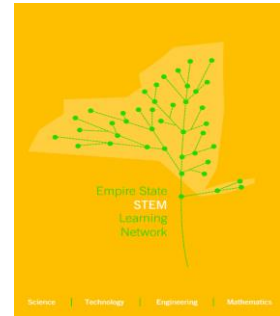
3:30 - 4:30 PM

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.

2018 Summer Institute Margaret Ashida STEM Leadership Award



To honor the memory of Margaret Ashida, the New York State STEM Education Collaborative will honor a STEM Leader in K-12/Higher Ed/STEM Workforce each year with a “Margaret Ashida STEM Leadership Award.” Margaret was an outstanding woman who created a wave of change by her tireless efforts to create connections between business/ industry and STEM educational leaders in colleges and the K-12 sector, not only here in New York State, but across America! She was a “thought leader” often creating ideas and connections between and among educators and business/industry to further the implementation of pathways for developing America’s STEM workforce. Through her advocacy, the NYS State STEM Hubs were created, pulling together New York communities in unique ways to foster the development of STEM career pathways. The Margaret Ashida STEM Leadership Award seeks to honor persons who are making significant STEM connections within their community through their time, actions, talents and dedication. The honorees selected serve as a role model for STEM Leadership as they are striving to enhance the STEM workforce through their connections between business/industry and STEM educational leaders.

The Mission of the Empire STEM Learning Network (STEM Hubs): to advance STEM education to prepare all students – regardless of their career goals – for college and career success, to fuel innovation and economic vitality in the Empire State.

Margaret was the Founding Chairperson for the Empire STEM Learning Network, a statewide, community-led collaborative; and a board member for the NYS STEM Education Collaborative (NYSSEC), a coalition of AMTNYS, NYSSPE, NYSTEEA, and STANYS. The Founding Members and Partners of the NYSSEC work collectively and collaboratively to deliver STEM Education in the spirit and vision of New York State’s MST Frameworks and Learning Standards and to skillfully and completely address the concerted national cry for STEM Literacy. Margaret will be missed but forever remembered by her work ethic, her dedication to excellence and her friendship to all she met.

New York State STEM Education Collaborative: <http://www.nysstemeducation.org/>

Committee Chair: Gwendolyn Maturo-Grasso glmaturo@syr.edu

Thank you to committee members: Joe Vargo, Chuck Goodwin, Mark Vaughn

Nominations October-March <http://www.cnystem.com/>

Margaret Ashida
STEM Leadership Award

2018 Margaret Ashida STEM Leader K-12



Mr. Omer Zengin

High School Math educator

Robotic Team Advisor Syracuse Academy of Science STEM Leader Instructional Coach

Omer Zengin has been teaching in Upstate NY for over nine years, primarily in High School mathematics. He is currently teaching Algebra 1 and Algebra 2 at Syracuse Academy of Science Charter School. With over nine years of extensive teaching experience and hard work and dedication he achieved the goal of getting all of his students to pass the Algebra 1 Regent exam in 2017. He believes that students learn best when they are actively engaged with high-quality, rigorous hands-on lessons that incorporate technology, and group activities.

He is also an active member of First Tech Challenge which is a robotics STEM program for grades 7-12. He believes that students learn more about the fields of science, technology, engineering, and math (STEM) through hands-on learning in the field of robotics by building and programming robots. Mr. Zengin also inspires students to join the schools enrichment programs, such as, Science Olympiad, Bridge Building Competitions, The MOST Steamboat Challenge, Rocket Challenge, and International Genius Olympiad at SUNY Oswego. Participating in these competitions allows students to learn more about math and science while expanding their knowledge in careers involving computer programming, business, and engineering. As you may know, getting young people interested in these fields is very important, not only to our community but also for New York and the entire US. He is also a Congressional Award Program Advisor who is helping students to make achievable and measurable goals for their personal development, community service, physical fitness and expedition/exploration. He is dedicating his weekends to guide students to achieve these goals. One of his students recently received a bronze and silver certificate from the Congressional Office. Mr. Zengin is also the recipient of numerous awards for his STEM endeavors in Central New York.

Margaret Ashida
STEM Leadership Award

2018 Margaret Ashida STEM Leader Instructional Coach



Aaron Stra

*Instructional Coach of STEAM
Salamanca City Central School District*

Aaron is Instructional Coach for Science and Technology at Salamanca City School District. He earned his Bachelor of Science from SUNY College at Buffalo and STEM Teaching Certificate at the American College of Education. While serving as Instructional Coach for Science and Technology, Aaron led a taskforce to design a STEM-wing modeled after a manufacturing firm and introduced a certificate program in 3-D modeling, industrial robotics, and biomedical technology.

Over the course of his career, Aaron taught numerous elementary and secondary courses in robotics, trades and instructional technology. In 2010, Aaron founded STEAM Learning Solutions, a grassroots learning company, which provides reusable STEAM kits to schools, summer camps and school-age childcare providers.

www.steamlearningsolutions.org

Margaret Ashida
STEM Leadership Award

2018 Margaret Ashida STEM Leader District Level



Kathy Southwell

*Executive Director of Curriculum, Learning and Instruction
East Syracuse Minoa School District*

Kathy Southwell is honored to be the Executive Director of Curriculum, Learning and Assessment at East Syracuse Minoa Central School District. Her professional experiences include a variety of leadership experiences, initially in the health care and private sector in science, then changing to K-12 education with teaching experience at the elementary, middle and high school levels. Kathy has systems leadership experience at the district, regional and State level, including the CNY Stem Hub, regional Science Strategic Planning, and numerous science and math advisory groups at the New York State Education Department. Over the last few years, Kathy has actively participated in the New York State Education Department's Science Steering Committee to plan for implementing the Statewide Strategic Plan for Science, including updating and implementing the New York State Science Learning Standards and providing input in the design of future assessments.

Kathy leads ESM's Strategic Planning and Implementation teams with a focus on innovating and transforming teaching and learning to prepare students to be leaders in a rapidly changing world. Inspired by her collaboration with Margaret Ashida, Kathy has been part of a leadership team developing innovative STEM learning models and career pathways at ESM. The development of student voice, leadership and strong business, community and higher education partnerships have been important priorities in the ESM Strategic Plan. ESM was recognized nationally in 2015 at the White House as one of the first STEM Learning Ecosystems.

Margaret Ashida
STEM Leadership Award

2018 Margaret Ashida STEM Leader Higher Education



Mary Margaret M. Small, Ed.D.
Office of Educational Partnerships
Clarkson University

Dr. Small is the Educational Partnerships Director at Clarkson University. In this role, Mary Margaret actively works to connect public schools, business and industry, and university resources to strengthen the educational experiences of pre-collegiate students and expand the instructional strategies of teachers. Under her direction, Clarkson faculty and students provide after school and summer STEM programming and discipline-specific workshops. She also coordinates summer research experiences for public school teachers and high school students. As a member of the Regional Economic Development Council's workforce development committee she works closely with industry professionals execute career awareness events throughout the seven county region.

Dr. Small holds a B.A. from SUNY Geneseo and a Masters and Doctorate from the University of Rochester. A lifelong educator, she has been a teacher, school administrator and college professor. She has a strong interest in curriculum and assessment, especially effective instructional models. Mary Margaret holds leadership positions in the North Country STEM Learning Network and North Country STEM Ecosystem. Clarkson University, under Mary Margaret's leadership, is a founding partner in the Collaborative Educator Summit, a two day cost-free professional development experience for school-based teams.

Margaret Ashida Legacy STEM Leadership Past Awardees

2015

STEM Workforce: Cheryl Davidson

Executive Director of Long Island Works Coalition

Pre-K-12 Schools: Donna DeSiato, Ph.D.

Superintendent East Syracuse Minoa Central Schools

Higher Education: Dean Nina Leonhardt

Associate Dean at Suffolk County Community College

2016

Pre-K-12: Mr. Marvin Cadornigara

Teacher New Explorations into Science, Technology and Math NYC

Pre-K-12 Schools/Higher Education: Michelle Kavanaugh, Ph.D.

Retired Superintendent of Schools; President WNY STEM Hub

STEM Workforce: Frank Roma, P.E.

NYS STEM Education Collaborative President-Elect

2017

PK-20: Mark D. Vaughn, Ph.D.

Manager, Technical Talent Pipelining for Corning Inc and
Lead, Technology Community Office of STEM-Corning Incorporated

Higher Education: Dr. Candice Foley

Chemistry Professor Suffolk County Community College

STEM Workforce: Marc A. Chiffert, P.E.

Managing Member of CHIFFERT Engineering P.C.

Outstanding: Craig Clark, P.E., Ph.D.

Vice President for Economic Development-Alfred State



STEM Trivia Night - Have Fun & Learn (2 PD)

Sunday, July 29, 7:00-9:00 PM

Central Dining Hall

Empire State STEM Learning Network

The Empire State STEM Learning Network is a statewide, community-led collaborative. The Network's mission is to advance STEM education to prepare all students for success in school, work and life to fuel innovation and economic vitality in the Empire State.

The Network is made up of 10 regional councils across the state. These Regional Councils include the following groups:

Capital Region

- Capital Region Center for Economic Growth

Central New York

- CNY STEM Hub

Finger Lakes

- Finger Lakes STEM Hub

Long Island

- Long Island STEM Hub

Mid-Hudson

- Lower Hudson Valley Region STEM HUB P-20 Educators

Mohawk Valley

- Mohawk Valley BOCES

New York City

North Country

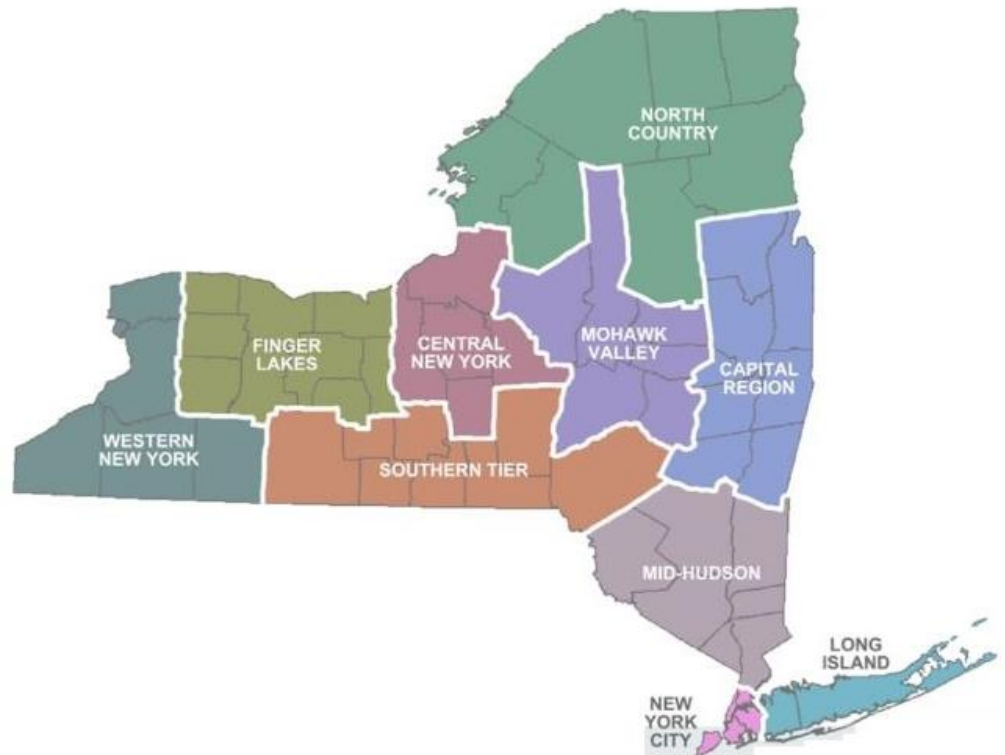
- North Country STEM Hub

Southern Tier

- Greater Southern Tier BOCES Science / STEM Resource Center
- Eastern Southern Tier STEM Hub

Western New York

- WNY STEM Hub





The CNY STEM Hub is focused on impacting students in the classroom by implementing new teaching strategies in multi-disciplinary/inquiry-based methodologies with real world applications.

Vision

The CNY STEM Hub will design and incubate educational models of excellence empowering all PK-12 students to excel in a rapidly changing world.

Mission

The CNY STEM Hub will interconnect business, higher education, community organizations and PK-12 schools to design, develop and demonstrate innovative, sustainable and transferable STEM learning experiences.

CNY STEM Hub Goals

1. By 2020, the CNY STEM HUB will exemplify the attributes of a professional metropolitan learning community by creating and sharing knowledge and successful, innovative learning experiences that ignite and strengthen problem solving and critical thinking abilities in K-12 learners for success in our global society.
2. By 2020, the CNY STEM HUB will strengthen instructional practices in K-12 STEM HUB classrooms through professional development for teachers and administrators in inquiry and design learning models.
3. By 2020, the CNY STEM HUB schools will design and develop trans-disciplinary learning experiences through design and inquiry with real-world context/application.
4. By 2020, the CNY STEM HUB will design, develop and incubate STEM literacy educational models that prepare students for college and career through the integration of 21st Century knowledge and skills.
5. By 2020, the CNY STEM HUB will systematically document effects of new learning experiences on short term and long term student learning, student motivation, and college and career trajectories and performance, with the intent to regularly publish new findings in the education literature.

Contacts:

www.cnystem.com

Joe Vargo

Partners for Education & Business
Phone: (315) 448-1012

Dr. Donna DeSiato

ESM School District
Phone: (315) 434-3012

Lisa Mondello

SRC, Inc.
Phone: (315) 452-8362





ABOUT THE FINGER LAKES STEM HUB

The Finger Lakes STEM Hub is a network of k-12 and college educators, community organizations, and businesses. It serves as a catalyst for collaboration and communication promoting quality STEM education and career exploration opportunities. It covers a nine county region of Greater Rochester and the Finger Lakes.

The Hub is managed by a director and assistant/web manager and advised by an executive committee. A roundtable of network members convenes monthly. Volunteers serve on its committees. Major supporters include AT&T, Siemens Industry, Rochester Museum & Science Center, Wards Science, Monroe Community College, SUNY Brockport, WXXI PBS, and Genesee Valley School Library Services.

A strategic plan was adopted for 2017-2022. Its initiatives/actions include the annual recognition of quality STEM programs, and a professional development institute/series of day long workshops for educators at different STEM industries to learn about the skills and training needed for success in that career field and how to apply what they learned in the classroom. A new website is under development. Hub sponsors Fall Forums on major STEM topics. For the second year the Hub has received funding from AT&T for pilot STEM projects. In 2017 it partnered with the RCSD, RMSC, and BSA Exploring to expose students to STEM careers in Rochester and this year with Greater Rochester Afterschool Alliance, Boys and Girls Club of Rochester, Girl Scouts of Western NY and Seneca Waterways BSA in a Teen Technology Challenge.

Hub members meet periodically with local members of the NYS Board of Regents to discuss STEM education related policy and practice matters.

www.empirestem-fl.org

flxstem.org (under development)

Contact: Joe Marinelli, Ph.D, Director of Finger Lakes STEM Hub at josephjmarinelli@aol.com or 585-704-4659

5/14/18



The mission of the Greater Mohawk Valley STEM Hub is to: Advance STEM education through innovative teaching and collaboration to prepare *all* students for success in the 21st century.

WHY STEM? WHY NOW?

- Create a workforce with 21st century skills, strong in STEM; connect education and private enterprise to create jobs; prepare for tomorrow by encouraging learning opportunities in STEM; leverage existing partnerships and build new and deeper collaborations.
- Align workforce and education investments with priority on building STEM programs.
- Ensure that the region's K-12 students develop 21st century skills aligned with specific industry clusters.
- Address regional workforce shortages in clean technology, biomedical, nanotechnology, information technologies, cyber security, healthcare, agriculture, and other key fields.
- Need for investment in K-12 education and for STEM programs to motivate children to pursue higher education in fields such as math, science and engineering.



The very first meeting of the group that would become the Greater Southern Tier STEM Learning Network was held on September 21, 2005...kicked off with this opening statement: "Life is a technology-driven enterprise: If so, then an interest in and an understanding of the embedded importance of science, technology, engineering and math to life-long learning and success is 'mission critical'". Today the network

is an active consortium of leaders and laity from PreK-12 education, Higher Education, Business and Industry and Science Museums on a mission to reenergize, revitalize and refocus attention, interest and understanding of the embedded importance of STEM to life-long learning and success. This mission is informed by our regional priorities as they pertain to STEM education. The priorities are fidelity of implementation and sustainability, regional assessment, development and/or deployment of STEM curricula at all grade levels, maintenance of R & D databases for data-driven decision making and the creation of systems solutions. Together, these priorities drive the realization of our primary objective: To significantly increase the numbers of STEM-capable GST graduates in general and, in particular, the numbers of students from GST schools who enter the workforce in the areas of science, engineering and advanced manufacturing.



The Eastern Southern Tier STEM (Science, Technology, Engineering, Math) Hub, located in Binghamton NY, is designed to cultivate the physical and financial resources necessary to keep our young people engaged in STEM programming and to educate and inspire tomorrow's scientists, engineers and mathematicians. The School-to-Careers Partnership is the conduit for funding this initiative,

employing the experience of BOCES' regional partners and 15 component school districts, as well as that of Binghamton University and SUNY Broome Community College. The STEM Hub has Pillar events which we help to coordinate and promote, our current pillar events are: Summer Steam Academy, Engineering Day, Steam Pathways Event, and Stem Hub/SUNY Broome Robotics Day. We also assist local businesses and organizations to help coordinate events such as Space Day with Kopernik Observatory & Science Center, Girls in Engineering at Lockheed Martin, and Engineering Explorer Post at BAE. Over the past 4 years we have funded over 37 grants for local schools who are focusing on a variety of STEM projects ranging from Lego stem robotics, Vex robotics, and Cubelets, to makerspace and mobile science labs, and a mission to mars. For the fourth year The STEM Hub, with the Greater Binghamton Education Outreach Program, organized the STEAM Pathways Event at Binghamton University's Innovative Technologies Complex. The STEAM Pathways Event was designed to engage both parents and their children in science, technology, engineering, the arts, and math by inviting local businesses to set up tables with activities and information. This event also had sessions designed for both parents and youth so that each group could meet with authorities on the subject at hand. Over 200 students and parents attended this event. We are currently able to run our programs thanks to a generous donation by Lockheed Martin. Our goal is to work with more of our local businesses to help with the financial sustainability for our Stem Hub so that we can continue to offer events and programming to everyone in our Broome-Tioga BOCES region. <https://eststem.com/>



Preparing today's learners to be tomorrow's innovators.



- ✓ Life-changing programs for students.
- ✓ Robust professional development for educators.
- ✓ Systemic improvement initiatives for school districts to change how the next generation learns.

We bring together Western New Yorkers to advance STEM learning in support of our region.

Learn more at www.wnystem.org

STEM Institute 2018

Poster Exhibition

Sunday, July 29, 5:00-6:00 PM and Monday, July 30, 5:30-6:45 PM

Central Dining Hall

Marc Chiffert - NYSSPE

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.

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.

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.

Anna Maria Fazio - Yorktown Central Schools

Mary Froats

Darrell Nansen

Creativity is the Key to STEM

Creativity is the core of a child's first encounter with learning. In order to foster creative and critical thinking skills students need to actively explore in learning. Hands-on activities and learning help create the teacher as design thinking manager or coach as opposed to instructor. Creativity can drive scientific discovery through engaging, hands-on activities. Inquiry based learning also activates students creativity and motivation to learn. STEM experiences can help students develop critical-thinking skills, creative problem solving and encouraging innovative thinking. Learning through teacher as the design thinking facilitator so that students develop a sense of ownership and practice in collaborating their thinking with peers.

Stephen Gilman - MakerState

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.

Tamera Gilmartin - SUNY Maritime College and SUNY Empire State College

Using 360 Degree Videos to Create an Immersive Learning Environment for STEM 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.

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 test, 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, attitude towards school, and academic scores.

Michelle Kavanaugh - President, WNY STEM Hub

Cherie Messore - Executive Director, WNY STEM Hub

Joseph Zawicki - Secretary, WNY STEM Hub

Life-Changing STEM Youth Projects

WNY STEM Hub convenes partners to deliver real-world youth experiences. This Poster Session will engage participants in overviews and outcomes from five youth projects: Student Spaceflight Experiments, Robotics, Girls Coding and Hand in Hand (3D Printed prosthetics) and Progressive Career Exploration©. Each project engages community and funding partners that provide resources and mentors to youth. Integrated STEM career pathway opportunities lead to increased self-efficacy and career engagement. Barriers to high need populations are addressed in the project design.

Jon Kriegel - Rochester Engineering Society, RES 2017 President & Volunteer Coordinator

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.

Linghong Li - SUNY Potsdam

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.

Richard Partch - Clarkson University, The Center for Advanced Materials Processing (CAMP)

Lance W Rudiger - NYSED consultant, STANYS

Breaking Technology and Science

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.

Sveta Reddy - Ithaca SMArtS/Cornell

Pooja Reddy - Ithaca SMArtS/Cornell

$1 * \infty = \infty$

$1 \times 0 = 0$ and $1 \times \infty = \infty$ Ithaca SMArtS is an initiative that strives to unite the fields of science, math, arts, and community service together to achieve one goal. If you have a high intellectual capability (1), but you lack thorough engagement in your relationships and in your community (0), then your overall impact is nonexistent. On the other hand if you utilize your knowledge to produce a positive impact on your surroundings, your existence will affect an unlimited number of people in the years to come (∞). This initiative uniquely combines STEM learning with "giving back to the community" component. By uniting elementary students, parents, school admins, teachers, middle/high/college students, and community members into the STEM learning experience, we are making the process fun, motivating, and engaging. This kind of learning assures students that they are not alone and encourages them to excel in areas most important to them. Mentors also play role models to some of these young scientists, and they continue to use this inspiration for their own benefit as they progress. Overall, it is a win-win for everyone involved! For five years, we have run the following programs under this initiative, "Elementary Science Olympiad", "How Cool is that" (role model program), "Build The Door", and "Grit". The main purpose of all these programs is to create an environment where Science Math, Arts and Service is explored, exhibited, and encouraged.

Robert Tufte, DTE - NYSTEEA

Paper Roller Coaster

The paper roller coaster is designed and constructed using technology and engineering standards for creation of models and artifacts. The physics involved shows the difference between potential and kinetic energy. Calculations of velocity and distance may fulfill math standards depending on the end use of the project in a classroom or club. A secondary residue of the design may be technical writing descriptions and engineering journals along with use of colors and aesthetic design to meet Art standards.

Karen Woodruff - Endeavor STEM Teaching Certificate Project

Methods of STEM Education for PK-5

Elementary classrooms are established settings for integrated STEM learning. Students are curious about the natural world and are often eager to get their hands dirty and minds engaged. The connections between Common Core State Standards ELA and Math with STEM content and Next Generation practices makes the 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.

Joseph Zawicki - NYS STEM Education Collaborative, STANYS, WNY STEM Hub

Kathaleen Burke, STANYS, Lab-Aids

Implementing the NYSSLS - Integrating STEM Learning

NYS has adopted the New York State Science Learning Standards, an 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.

Dr. 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.

STEM Institute 2018

Undergraduate Poster Exhibition

Sunday, July 29, 5:00-6:00 PM *and* Monday, July 30, 5:30-6:45 PM
Central Dining Hall



STEM for Rural America

No name - SUNY Alfred, [Architecture](#)

Arial Lifts

Robert Sturtz & Samantha St. George - SUNY Alfred, [Construction Management](#)

Safety During Concrete and Masonry Construction

Zebediah Hoffman & Kenneth Jean - SUNY Alfred, [Construction Management](#)

Know Your Soil Types

Joseph Johnson - SUNY Alfred, [Construction Management](#)

2017-2018 Basic Utility Vehicle

Devan Albrecht, Thomas Moracco & Justin Niver - SUNY Alfred, [Mechanical Engineering](#)

Portable Snowmaker

Dillon Fairhead - SUNY Alfred, [Mechanical Engineering](#)

Heating and Cooling of a Rifle Barrel

Mark Antes - SUNY Alfred, [Mechanical Engineering](#)

Anti-Theft Ladder Treestand

Trystan Duell & Thomas Knapp - SUNY Alfred, [Mechanical Engineering](#)

Innovated Tech Board

Daniel Gleason & William Gerhardt - SUNY Alfred, [Mechanical Engineering](#)

STEM Institute 2018

Presentation Schedule

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

Image KEY

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



Science



Technology



Engineering



Mathematics



English
Language
Arts



Arts

July 30, 2018

Session 1, Monday, 10:15 – 11:15 AM

K-4 5-8 9-12



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Arts

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



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Arts

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 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.sparkfuneducation.com/author/jeff-branson> <https://www.facebook.com/SparkFun/posts/10152011617151416>

9-12 13-16



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Arts

1C Physical Health Sciences Building - PHS 106

Linghong Li - SUNY Potsdam

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.

K-4 5-8 9-12



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1D Physical Health Sciences Building - PHS 101

Pam O'Brien - STEMscopes

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.

K-4 5-8



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ELA

1E Physical Health Sciences Building - PHS 107

Karen Woodruff - Endeavor STEM Teaching Certificate Project

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

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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.

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2E Physical Health Sciences Building - PHS 223

Ben Moore - PCS Edventures

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.

9-12

13-16



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2F Physical Health Sciences Building - PHS 106

Craig Clark – SUNY Alfred, VP

Middle Skills Occupational Gap in WNY

Middle Skills Occupational Gap in WNY <https://cld.bz/eAiFEt> 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.

Session 3, Monday, 3:15 – 4:15 PM

9-12



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ELA

3A Central Dining Hall - CDH Allegany Room

Ellen Falk - North Salem Middle High School, NYS MCAP, AMTNYS

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.



3B Physical Health Sciences Building - PHS 106

Cherie Messoré - WNY STEM Hub

Ed Hawkins - Sweet Home High School

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 additive 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.

5-8

9-12

13-16



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3C Physical Health Sciences Building - PHS 107

Richard Partch - Clarkson University, The Center for Advanced Materials Processing (CAMP)

Lance W Rudiger - NYSED consultant, STANYS

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.

K-4

5-8



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Arts

3D Physical Health Sciences Building - PHS 101

Stephen Gilman - MakerState

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.

K-4

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9-12



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.

K-4



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!*

Image KEY

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

K-4

5-8

9-12

13-16



Session 4, Monday 4:30 – 5:30 PM

9-12



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.

K-4 5-8 9-12



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.

K-4 5-8



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 awarding 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 first known photographer of snowflakes. Share modern ways that snowflakes are photographed and then introduce students to the 3D snowflake generator web site so students can try to create their own snowflakes. This project can be part of a unit on Weather, Technology and the Arts.

K-4 5-8



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 test, 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, attitude towards school, and academic scores.

K-4



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.

July 31, 2018
Session 5, Tuesday 8:00 - 9:00 AM

5-8 9-12 13-16



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Arts

5A Physical Health Sciences Building - PHS 223

Tamica Stubbs - BioRad

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.

5-8 9-12 13-16



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Arts

5B Physical Health Sciences Building - PHS 105

James Alloway, Jr. - EMSQ Associates

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.

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



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Arts

5C Physical Health Sciences Building - PHS 101

Susan Bartle - School Library System, E2CC BOCES

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.

5-8 9-12 13-16



5D Physical Health Sciences Building - PHS 216

Robert Tufte, DTE - NYSTEEA

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.

13-16



5E Physical Health Sciences Building - PHS 107

Marc Chiffert - New York State Society of Professional Engineers (NYSSPE)

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.

Session 6, Tuesday 9:15 - 10:15 AM

K-4



6A Physical Health Sciences Building - PHS 101

Anna Maria Fazio - Yorktown Central Schools

Mary Froats

Darrell Nansen

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 5-8



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.

9-12 13-16



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.

5-8 9-12



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.

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



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, an 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.

K-4



6F Physical Health Sciences Building - PHS 218

Colleen Kelly - Orchard Park Schools

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

9-12 13-16



7A Physical Health Sciences Building - PHS 101

Sean Corcoran - ACT, Inc.

Cary Schoener - ACT, Inc.

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.

K-4

5-8

9-12



7B Physical Health Sciences Building - PHS 107

Leah Hamilton - Phelps Library and STEAM Lab Makerspace; FL STEM Hub

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.

9-12



7C Physical Health Sciences Building - PHS 223

Melissa D’Andrea - Girls Inc. of New York City

Andrea Oliver - Girls Inc. of New York City

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.

9-12

13-16



7D Central Dining Hall - CDH Allegany Room

Obaroene Otitigbe - Albany City School District

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).

5-8 9-12



7E Physical Health Sciences Building - PHS 105

Joshua Schuler - Intelitek (ISCEF)

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.

5-8 9-12 13-16



7F Physical Health Sciences Building - PHS 106

Chuck Goodwin - NYS Technology & Engineering Educators Association

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

K-4 5-8 9-12



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!

K-4 5-8 9-12



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.

9-12



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.

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



8D Physical Health Sciences Building - PHS 106

Tamera Gilmartin - SUNY Maritime College and SUNY Empire State College

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.



8E Physical Health Sciences Building - PHS 107

Mark Vaughn - Corning Incorporated

Steve Pilgrim - Alfred University

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.



New York State STEM Education Collaborative Summer Institute Series

2010 SUNY Oswego

2012 Syracuse University

2014 SUNY Alfred State College

2015 SUNY Alfred State College

2017 SUNY Alfred State College

Poster & Presentation Sessions

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Alfred Campus



Agriculture Science (AGRLAB)
Agriculture & Veterinary Technology
Student Records & Financial Services
(Records, Financial Aid, Student Accounts)

Central Dining Hall (CDH)
ACES Business Office
Alfie's
Allegory Room
Island Oasis
Student Gathering Place
Taco Bell
The Terrace

EJ Brown Hall (BRWNHL)
Business
Court Reporting

Engineering Technology Building (SET)
Architecture & Design
Bret Llewellyn Art Gallery
Civil Engineering Technology
Computer & Information Technology
Dean, School of Architecture,
Management & Engineering
Digital Media & Animation
Mechanical & Electrical Engineering Technology

Hinkle Memorial Library
Center for Teaching & Learning
Computer Help Desk
Marketing Communications
Technology Services
Lockers for commuter students

Hunter Student Development Center (SDC)
English & Humanities
Instructional Technologies
Math & Physics
Social & Behavioral Sciences
Student Success Center

Huntington Administration Building
Admissions
Alumni Office
Executive Vice President
Institutional Advancement
Office of Academic Affairs
President's Office
Provost
Visitor Reception

MacKenzie Complex
TimberLineZ (TLZ)

Orvis Activities Center (STUACT)
Athletics Department
Cappadonia Auditorium
Orvis Strength and Conditioning Center
Gym/Pool

Physical & Health Sciences (PHS)
Dean, School of Arts and Sciences
Nursing
Physical & Life Sciences

Pioneer Center
Human Resources
Business Affairs
Pioneer Fitness Center

Print & Mail Services
Mailroom / Printing & Duplicating

Student Leadership Center (SLC)
Campus Store
Career Development
Center for Civic Engagement
Center for Equity, Inclusion and Title IX
Climbing Wall
Ever Green Cafe
International Education
Judicial Affairs
The Oasis
Student Engagement & Orientation
Student Senate Offices
VP for Student Affairs
WETD Radio Station 90.7FM

TA Parish Hall
Health & Wellness Services
MindSpa

Theta Gamma House (UP)
Brick Victorian-style building that houses University Police. Available 365 days a year, 24 hours a day.

Townhouse Complex
Townhouse Commons:
College Housing
Residential Services

10 Elm
Fresh Market & Cafe



Key

Visitor Reception

Administrative Building

Academic Building

Important

Medical Services

Handicap Parking

Commuter Parking

Residence Hall

Dining & Gathering Area

Library

Designated Smoking Area

Upperclassmen Parking

Student Parking (including commuters)

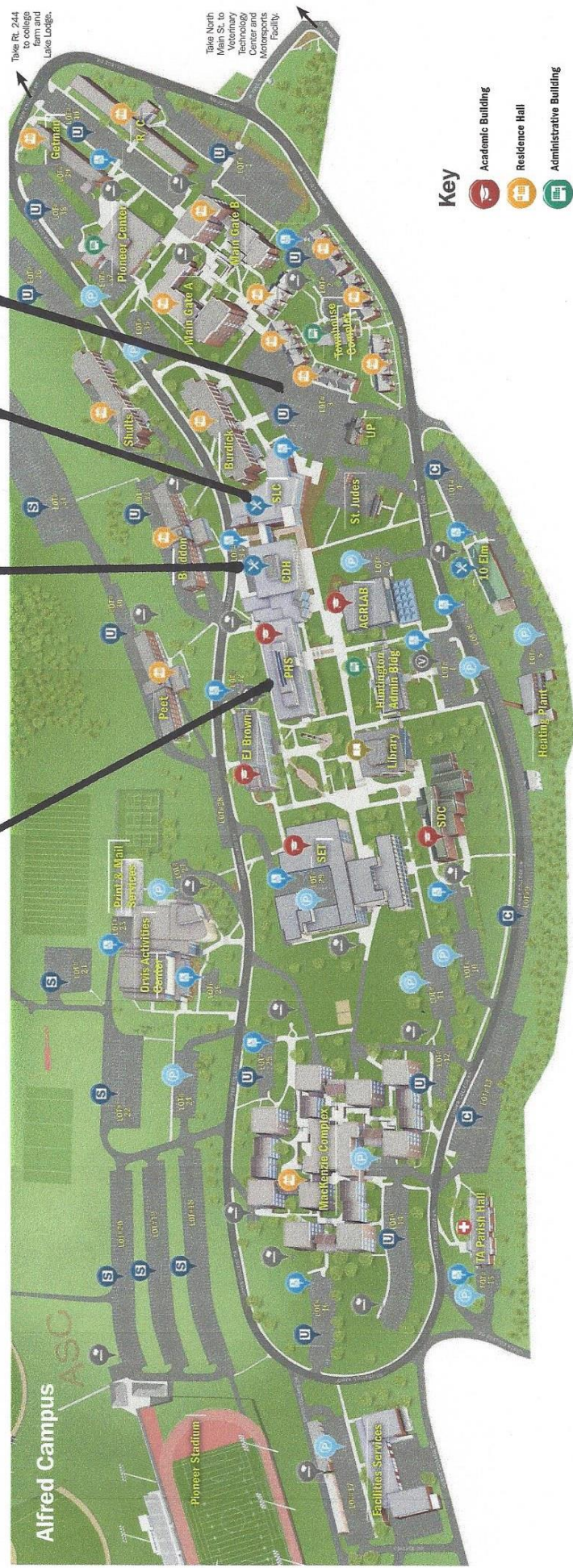
Faculty/Staff Parking

Visitor Parking

Physical and Health Sciences

Central Dining Hall

Check-in Parking



Key

- Academic Building
- Residence Hall
- Administrative Building
- Dining & Gathering Area
- Library
- Emergency Phone
- Designated Smoking Area
- Medical Services
- Handicap Parking
- Commuter Parking
- Upperclassmen Parking
- Student Parking (including commuters)
- Faculty/Staff Parking
- Visitor Parking

Motorsports & Vet Tech Complex



Student Leadership Center (SLC)

- Student Leadership Center
- Center for Civic Engagement
- Center for Equity, Inclusion and Title IX
- Climbing Wall
- Student Government
- International Education
- Judicial Affairs
- The Oasis
- Student Engagement & Orientation
- VP for Student Affairs
- VP for Student Affairs
- WETD Radio Station 90.7FM

TA Parish Hall

- Health & Wellness Services
- Mind Spa

Theta Gamma House (UGP)

- Rocky Mountain building that houses University Police. Available 365 days a year, 24 hours a day.

Townhouse Complex

- Townhouses Commons
- College Housing
- Residential Services

10 Elm

- Fresh Market & Cafe
- Pizza Hut

Hunter Student Development Center (SDC)

- Instructional Technologies
- Math & Physics
- Social & Behavioral Sciences
- Student Success Center

Huntington Administration Building

- Alumni Office
- Executive Vice President
- Institutional Advancement
- Office of Academic Affairs
- Provost's Office

Orris Activities Center (STUACT)

- Athletics Department
- Cappadonia Auditorium
- Six Sigma Center
- Gym/Fitness

Physical & Health Sciences (PHS)

- Dean, School of Arts and Sciences
- Nursing
- Physical & Life Sciences

Pioneer Center

- Human Resources
- Business Affairs
- Pioneer Fitness Center

Print & Mail Services

- Mailroom
- Printing & Duplicating

Agriculture Science (AGSAB)

- Student Records & Financial Services (Records, Financial Aid, Student Accounts)

Central Dining Hall (CDH)

- ACES Business Office
- Alumni Room
- Island Oasis
- Student Gathering Place
- The Terrace

EJ Brown Hall (BRWNHL)

- Court Reporting

Engineering Technology Building (SET)

- Architecture & Design
- Art & Design
- Computer & Information Technology
- Dean, School of Architecture, Management & Engineering
- Digital Media & Animation
- Mechanical & Electrical Engineering Technology

Hinkle Memorial Library

- Center for Teaching & Learning
- Computer Help Desk
- Marketing Communications
- Technology Services
- Workers for commuter students