

# STEM ACADEMY

## *Morristown High School*



### Annual Review

**Integration, Design & Innovation** are the current pillars that define the Morristown High School STEM Academy as it soars into its fifth year of programming. The academy program has doubled down on programs and skill sets that parallel curricular learning while providing foundational skill sets that promote student innovation. As the world continues to embrace STEM education and career pathways the Morristown High School STEM Academy remains on the cutting-edge of this revolution. Now in its fifth full year, the MHS STEM Academy is at the forefront of STEM instruction in New Jersey.

The MHS STEM Academy has created a learning experience like no other program in terms of STEM curriculum, research & design, professional experiences and mentorship. Students enrolled in the STEM Academy get the best of what MHS has to offer while being fully integrated in STEM Academy programs and initiatives. Students have the opportunity to focus their concentration of curricular studies and experiences in fields such as Research Science, Biomedicine, Engineering, Architecture, Environmental Sustainability and Computer Science.

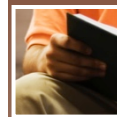
### STEM NEWSLETTER

2017



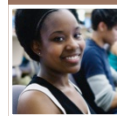
Integrated Freshmen STEM Course Builds Foundational Skill Sets

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*"Supporting innovative thinkers and collaborative learners for a 21st Century STEM environment"*



## What's New?

This past year the STEM Academy saw many new initiatives and programs come to life. The STEM Academy started a push to bring STEM education to all avenues of students by starting a Girls in STEM Club, a Girls Who Code program and a National Society of Black Engineers Chapter (NSBE Jr.). The MHS STEM Academy also teamed up with the professionals at NK Architects to begin a year long partnership in the ACE Mentor Competition for architects and engineers. This program is pairing MHS STEM students with professional architects and engineers to revitalize an “urban outdoor space” in the Morristown Community. 2017 was an exciting summer as the MHS STEM Academy hosted a two week long summer Girls Who Code camp for middle school and high school students from across the state of New Jersey and Pennsylvania.

## Core Beliefs

The MHS STEM Academy continues to build off of the Seven Key Components that were outlined and put in place to serve as an educational foundation. These components serve as the cornerstone of the MHS STEM program as well as STEM instruction across the Morris School District. These original components are:

### **Seven Core Components of the MHS STEM Programs**

1. Enhancing STEM Curriculum & Co-Curricular Programs
2. Implementing an Academy Learning Model
3. Hiring Faculty Experts
4. Creating a Blended Technology Learning Model
5. Redesigning Building Facilities & Learning Spaces
6. Developing Professional Connections & Mentorship Programs
7. Establishing Post-Secondary Partnerships

Along with the original core components a new area of focus has been infused into the program. The newest core component includes aspects of **Engineering Design, Design Thinking and Student Innovation**. This newly developed core principle stresses design thinking in student problem solving that can be applied to the design loop of experimentation, innovative creations and capstone projects. As we head into 2018 design thinking skill sets, workshops and practices have been implemented in all aspects of the academy learning experience.



## Highlights

Some of the highlights from the 2016-17 school year included \$64,000 in grants received for STEM programs; nationally ranked students in science leagues and Olympiads; an Emperor Science Award Winner; top rankings in Morris County and New Jersey in AP science programs; engineering, rocketry, coding, environmental and technology student clubs; collegiate program connections with Princeton, University of Michigan, Texas A&M, Rutgers, Cornell, NJIT, TCNJ, Stevens Institute, Drew, College of St. Elizabeth's, Berkeley College, and Fairleigh-Dickinson University; professional partnerships with Atlantic Health, SGAP, PSE&G, JCP&L, First Energy, BASF, Novartis, Bayer, NSBE, Girls Who Code, NJTEEA, Tween Tech, AAUW, ECN, Global Media, Gearhart Law, Picatinny Arsenal, Curious Young Writers, NK Architects, Princeton Plasma Physics Lab, Just Jersey, Morristown Animal Hospital, Boy Scouts of America, Grow it Green of Morristown, Morristown Clean Communities, Shade Tree Commission of Morristown and many more.



## Future

As we head into 2018 the MHS STEM Academy continues to grow with 250 members, while preparing for the future of integrated STEM education, Engineering Design and Student Innovation. Integrated STEM programs have been streamlined and articulated across the Morris School District from PreK to 12th grade. Outside of the MHS STEM Academy a full-day STEM curriculum is in the works for our PreK leveled programs, Engineering Design Challenges, Integrated Next Generation Science lessons, and evening STEM events have been introduced in every K-5 building, STEM electives such as robotics, coding and CAD engineering principles are reaching all middle school students along with STEM co-curricular clubs such as TSA, Robotics and NSBE Jr.

Take a deeper dive inside our annual newsletter to explore the many STEM events from the past year and follow us on twitter: **@MSD\_iSTEM** for an in-depth look into our classrooms and programs!

*Brian S. Young  
Supervisor of STEM Education  
Morris School District*



*CAD Engineering & Architecture Lab*



*Learning Commons*

## Integrated STEM Class Allows Students to Build Foundational Skills Across Disciplines

If you are looking for a foundational structure that supports the MHS STEM Academy then look no further than the freshmen “Integrated STEM” course. Designed as an introductory experience, the Integrated STEM course allows freshmen students the opportunity to develop transitional STEM skill sets that will support innovation throughout their high school and



professional careers. The course integrates core STEM areas of study such as engineering, architecture, sustainability, biomedicine, research and computer science. Student's work through design challenges and innovation tasks that incorporate all areas of study integrated into each experience. *“If you want to study the circulatory system by building a heart-rate monitor using an Arduino coding board then this is the class for you”, Ms. Lauren Shohen, Integrated STEM Instructor. “In this class students get a real feel for different STEM fields by integrating technology and the design process while working in collaborative groups to solve tasks.”* The course is in its third year of running and has quickly become the cornerstone for the STEM experience at Morristown High School. Each marking period students are working through a different STEM field through the integration of technology. *“STEM education is not meant to be taught in stand-alone, silo classrooms. We wanted to develop a course that was integrated with a variety of skill sets that students could use to propel them throughout their educational and professional careers”, Mr. Brian Young, STEM Supervisor.*

The course culminates in a capstone design project where each student uses the skills taught toward constructing an innovative project of interest. The capstone projects are displayed in June during the annual MHS Design Show. *“It is amazing to see the projects students come up with when you provide them with*



*skill sets and space to create. This past year we saw students developing wireless drones, a braille machine using Arduino, tuning sensors using rock candy and sustainable hydroponic ecosystems”, Dr. Anthony Danese, Integrated STEM Instructor.* As we move into the 2018 school year the freshmen iSTEM course has been expanded to three full sections.



# Design Thinking: The Core of Innovative Learning



*"Design thinking is the fundamental process of applying elements from a thinker's toolkit such as empathy and experimentation to arrive at innovative solutions"*

The Morristown High School STEM and Humanities Academy have begun to dive into the practice of Design Thinking and empathetic problem solving. In 2017 the Academies partnered with *The Student Global Ambassador Program* (SGAP) and *Princeton University* to host a variety of workshop opportunities for students.

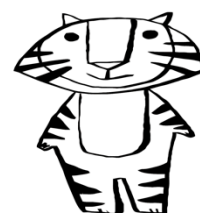
The start-up program was facilitated by Princeton's design thinking and social innovation coach, Rafe Steinhaur, along with student members of the *Tiger Challenge* group. This event was hosted by the MHS STEM Academy and focused on targeting student stress and anxiety. Students had the opportunity to dive deep into investigative work surrounding design thinking and human-centered design. This SGAP sponsored *Think Design* event provided a unique, out-of-classroom learning opportunity for students by engaging them in a range of critical thinking and problem-solving activities. The students used innovative and collaborative non-traditional educational strategies to solve empathetic issues. The basis of this particular event was to bring MHS STEM Academy students together with Princeton University's Tiger Challenge Group to investigate teenage innovation and stress management through the design process.

The Morristown High School STEM and Humanities Academies are continuing to partner in efforts to bring Design Thinking programs and experiences to all Morristown students. These events are a groundbreaking approach to collaboration between MHS, Princeton University, and SGAP that has led to future educational programs. In the 2017-18 school year two more Think Design events have been planned along with a proposed Design Thinking elective course to be implemented into the MHS curriculum catalog. In the spring of 2017 a second large-scale event was hosted at Fairleigh-Dickinson University which focused around world hunger and food waste. Design Thinking programs are now reaching out to not only the STEM and Humanities Academy but all students here at Morristown High School!



## TIGER CHALLENGE

Learning to Serve by Innovating Together



## ***“CAMP Out” Brings Students to Morristown Medical Center to Meet with Alumni***

MORRISTOWN, NJ - The Morris Educational Foundation (MEF) hosted its first ever CAMP-Out event on Thursday, June 8, 2017. The event, held in collaboration with Morristown Medical Center, part of Atlantic Health System, is an extension of the MEF's efforts connecting successful Morristown High School alumni with current students. The program is designed to bring high school students onsite to alumni places of work for lunch and learn programming and activities. C.A.M.P. stands for Colonials Alumni Mentoring Program



“The MEF has decided to alternate yearly between its successful CAMP (Colonial Alumni Mentoring Program) Night, where students rotate around the school and interact with alumni in various fields of interest, with a new event, aimed at giving students an even closer look at a particular field of interest,” said Chrissie Wetherbee, Associate Executive Director of the MEF. “CAMP OUT will offer multiple career-track events that will take students into the community for an up-close and personal experience – and we could not think of a better partner our first year than Morristown Medical Center,” she added.

Morristown High School alumni who volunteered to share their professional experiences with the high school students are Gerard Begley, DMD, '81: Oral and Maxillofacial Surgery; Susan Errickson Wood, BSN, RN-BC, '82: Craniofacial Center & Goryeb Neuro Oncology; and Taryn Ferrara, '06: Primary Care Sports Medicine Fellowship & Sports Health Coordinator.

Approximately 30 current Morristown High School students who are studying Anatomy/Physiology or are in the Health Professions Club visited these professionals at Morristown Medical Center for career “show and tells” on Thursday June 8th.

“From the evening we announced our partnership, Morristown Medical Center has been committed to showing local students many exciting career opportunities available in health care,” said Trish O’Keefe, PhD, RN, president of Morristown Medical Center. “We will continue to work closely with the Morris Educational Foundation to implement programs like CAMP-Out that give students the real-life experiences that may offer them the opportunity to determine a future path in health care. “The goal for the day was to provide an opportunity for MHS students to learn from and network with alumni who have achieved success in their careers,” Wetherbee added. *By TAPINTO MORRISTOWN CONTRIBUTOR June 13, 2017*





## Morristown High School Advances to National Finals of World's Largest Rocket Contest

**MORRISTOWN, NJ** — Colonial Rocketry from Morristown High School has qualified to compete in the national finals of the 15th annual Team America Rocketry Challenge (TARC). The team will face 99 of the top rocketry teams from across the country to claim the title of national champion. The TARC Final Fly-Off will take place May 13 at Great Meadow in The Plains, VA, outside of Washington, D.C.

“The students worked incredibly hard to meet the requirements for this year’s challenge,” said Deborah Spencer, who also teaches Physics and Aerospace Engineering at Morristown High School. “These are truly innovative kids who have gained experience with problem-solving, teamwork and creativity. I’m very proud of what they’ve achieved.”

TARC is the aerospace and defense industry’s flagship program designed to encourage students to pursue study and careers in science, technology, engineering and math (STEM). The competition challenges middle and high school students to design, build and fly a rocket that meets specific altitude and flight duration parameters. This year’s rules require a rocket carrying one raw egg to reach 775 feet before returning the egg to Earth, uncracked, all within 41 to 43 seconds.

Morristown is new to the competition, entering only the competition for the second time. “Some of the team members were completely new to rocketry,” said **Nathanael Yarger**, team captain, a senior at Morristown High School, “But TARC really draws you in, this is only our second year but we came together as a team, each contributing in their own unique way.”

Morristown is the only team to qualify from New Jersey. Morristown High School will compete for more than \$100,000 in prizes and scholarships, and the opportunity to represent the United States at the International Rocketry Challenge taking place at the Paris Air Show in June. At the international fly-off, teams from the United Kingdom, France and Japan will face the U.S. champions for the international title.

Sponsored by the Aerospace Industries Association, the National Association of Rocketry and more than 20 industry partners, TARC is the world’s largest rocket contest. Now in its 15th year, TARC has inspired more than 65,000 middle and high school students to explore education and careers in STEM fields. This year, 812 teams representing 48 states, the District of Columbia and the U.S. Virgin Islands designed and built model rockets in hopes of qualifying for the National Finals.

For more information about TARC 2017, please visit [www.rocketcontest.org](http://www.rocketcontest.org).  
<https://www.tapinto.net/towns/morristown/articles/morristown-high-school-advances-to-national-final>



## RESEARCH SCIENCE @ MORRISTOWN HIGH SCHOOL

### Instructor, Erin Colfax



The Research Science program at Morristown High School completed another successful campaign during the 2016-17 school year. The research program consists of a two-year course that allows students the opportunity to research, design, and compete with self-designed scientific hypotheses and experiments. Research Science I introduces the research science process with a focus on research skill development. Emphasis is placed on techniques and methods of research-based experimentation. Research Science II builds upon the practices and principles addressed in year one from the fundamental perspective with a focus on research skill development. Emphasis in this course is placed on techniques and methods to help students analyze, interpret, and draw conclusions based upon his/her research project. Students acquire a base knowledge in analyzing and interpreting investigative data gathered in their research project. Upon completion of the course, the research analysis will then be presented in a symposium utilizing multimedia, regional science fairs and competitions. All Research Science students identify and chose a collegiate or professional mentor to guide their experimental process. During the 2016-17 school year, students in both the RS1 and RS 2 classes earned grants from numerous renowned organizations and companies and partnered with mentors from universities around the country. Continue reading on the next page for a complete Abstract of each student's work.





### Leah Grossman: Grade 11



Strep throat, a global ailment, results from Group A *Streptococcus* bacteria in the throat and is currently diagnosed via throat culture or Rapid Antigen Detection Test. Although these are the currently accepted means of diagnosis, their outcomes come with many false results due to variables such as swabbing technique and temperature exposure to the bacteria. The purpose of this study was to develop a bio-optical detection mechanism that directly diagnoses the presence of Group A *Streptococcus* bacteria in the throat. Because *Streptococcus pyogenes* secretes lactic acid after metabolizing glucose, a pH indicator made from boiled cabbage was created to note a color change from neutral to acidic. That indicator was sprayed onto grown *Streptococcus pyogenes* to see if a color change due to an acidic pH occurs. When conducting this test, cabbage was boiled to create a natural pH indicator that showed changes in pH when tested in the classroom with distilled water, lactic acid, and baking soda. *Streptococcus pyogenes* bacteria was grown on 5% sheep blood agar and sprayed with the indicator to highlight the presence of lactic acid. Negative data was obtained because no bacterial plates reacted to the pH indicator. Though bacterial growth was present on every plate and the pH indicator had

previously worked in ideal conditions, the pH indicator and bacteria had no reaction. It was determined that using cabbage as a natural pH indicator to identify the presence of *Streptococcus pyogenes* bacteria is not feasible due to the low concentration of lactic acid secreted by the bacteria. Further research should be done to determine additional pH indicators that could detect the presence of acid in concentrations lower than 37.5% in distilled water.

### Sean Oddoye: Grade 10

Lassa Virus (LASV) is the etiological catalyst for Lassa fever, an acute hemorrhagic disease with a mortality rate of 15%. The Lassa virus is a single-stranded RNA that has four major lineages that vary according to geographic region. Relative to other diseases, global understanding of the Lassa Virus is limited, thus the need to quantify and analyze its evolutionary tendencies, particularly nucleotide polymorphisms within the virus arises. Additionally, patterns that emerge from phylogenetic trees can be used to assess the structure of a population while also allowing for predictions of the genetic makeup. The purpose of this investigation was to develop a more streamlined means of calculating nucleotide diversity within a subpopulation of Lassa virus strains and to augment a phylogenetic tree of the Lassa Virus *glycoprotein precursor* (GPC) segment. A total of 25 complete data sequences of LASV strains were obtained from the *Genbank* Archives. In phase one of this investigation, the sequence data was inputted into *MEGA* analytical software and the sequence diversity was derived on a nucleotide level. Data from the individual strand sequences were used to augment a phylogenetic tree using *Treeview X* software. In phase two of this investigation, an algorithm was created using *RStudio*, via *BSGenome* and *BioStrings* extensions. The sequence diversity derived from the statistical analyses on *MEGA* was compared to that of the algorithm created. A percent error calculation compared both methods of obtaining the sequence diversity (the diversity calculation using *MEGA* was treated as the accepted value while the diversity calculation using the augmented algorithm was treated as the experimental value). A percent error of 8% was obtained thus rejecting the alternative hypothesis. It is suggested that future research focuses on creating a refurbished version of the algorithm to calculate nucleotide diversity with at percent error  $\leq 5\%$ .

### Thomas Rudd (Grade 11) and Anna Hess (Grade 12)

Migratory birds undergo a notoriously difficult journey. This journey has recently become more difficult because of human activities. Ornithologists have been searching for methods to counter the harmful effects of human activity on both resident and migratory bird populations. Resident and migratory birds search for four environmental factors when looking for a suitable habitat: shelter, space, food and water. The investigation was created to discern whether the provision of habitat enhancement features could increase bird sightings, which would indicate that the schoolyard habitat became more suitable for birds. The goal of the investigation was to increase bird sightings within the Morristown High School schoolyard habitat by providing habitat enhancement features of: bird baths, feeders, and houses. To identify whether the installation of enhancement features attracted birds to the habitat, bird tallies were taken before and after the installation of habitat enhancement features. Eight- one hour observations periods were used to sight birds within the Morristown High School habitat. Observations failed to show a strong correlation between bird sightings and the installation of habitat enhancement features on school property. It is recommended that in future studies, the observation time frame is extended to a year long study.

## STEM STUDENTS TEACH NANOSCIENCE AT THE MORRIS MUSEUM

By: Jan Franco - March 7, 2017

On Saturday March 4th, 2017 Morristown High School students taught young children about the wonders of the nano world and its latest science and technologies. They weren't alone as their teacher, Mariel Kolker, managed and ensured that everything ran evenly. The students of Morristown High School brought their knowledge and information from their class to demonstrate the fascinating complexities of nanoscience.

These students are part of a new class at Morristown High School called Nanoscale Science & Engineering, in which they learn all about how materials and substances change their behavior when brought down to the nanoscale. Looking beyond the way materials behave at the macro (human) scale, they explore things like the effects of viscosity and movement at the molecular level, the behavior of materials at the nanoscale and how they react to light, forces, etc. Students applied what they learned as they developed and delivered kid-friendly exhibits for young children to explore at the Morris Museum. From buck balls to sticky hands, kids were introduced to the nano world through fun activities, which they enjoyed as much as their parents did. "Education is the most powerful weapon which you can use to change the world" said Arielle West, while her daughters were changing red gold nanoparticles to blue.

This is the third year for this revolutionary course at Morristown High School, which was developed by Ms. Kolker through a partnership with Stevens Institute of Technology. "Students always surprise themselves with how much they actually understand about the unique behavior of materials at the nanoscale," says Ms. Kolker. ***"Explaining complex phenomena to 4-6 year olds is not easy, but they consistently do well. If we excite even one child about science, then the endeavor is a success."***







## Morristown High School STEM Academy Teacher Honored By The NSTA

The National Science Teachers Association recently awarded the Northrup Grumman Foundation Excellence in Engineering Education Award to Morristown High School science teacher Mariel Kolker. The award recognizes excellence in the field of engineering education.

Ms. Kolker has been recognized nationally for her leadership in addressing the disparity in the number of females enrolling in STEM studies or careers. In an effort to study and address this issue, she instituted an all-girls engineering class at MHS and established a Girls in STEM club and a Girls who Code club at MHS. She has presented her research on the gender gap in STEM at Rutgers University and been a keynote speaker on the subject at numerous regional and national conferences.

An innovative physics and engineering teacher, Ms. Kolker partnered with researchers in the Soft Materials lab at Stevens Institute of Technology for 4-years to develop one of the nation's only Nanoscale Science and Engineering courses for high school students in the Country.

Kolker believes the skills and habits learned through engineering education, specifically the engineering design process, can be applied to any problem or challenge in life. "The engineering design process defines the steps in developing a solution to a problem and provides a critical thinking mindset that can be applied to any challenge," she explained. "Engineering, therefore, is not just for science, technology, engineering, and math courses; it applies to every course, every challenge life brings. I am an advocate for engineering education for precisely this reason. I strive to enable students to be critical thinkers and problem solvers, whether they go on to become engineers or not."

Ms. Kolker holds a BA in Finance from Fordham University and a BS in Mechanical Engineering from Rutgers. She became a teacher in 2000 following a 13-year career as a financial analyst and operating supervisor in the energy industry. She currently is pursuing a Doctorate in Educational Leadership at the University of Massachusetts. Her dissertation will focus on educating teachers to help understand and combat the gender gap in engineering and coding professions.

"Ms. Kolker has been a champion for integrating engineering education at the high school level and supporting under-represented groups in STEM education," said Brian Young, Morristown High School Supervisor of Instruction and Curriculum. "She continues to promote STEM education, engineering and gender equality in science throughout our District as well as on the national stage. We are extremely grateful to have Ms. Kolker working and inspiring our students here in the Morris School District."

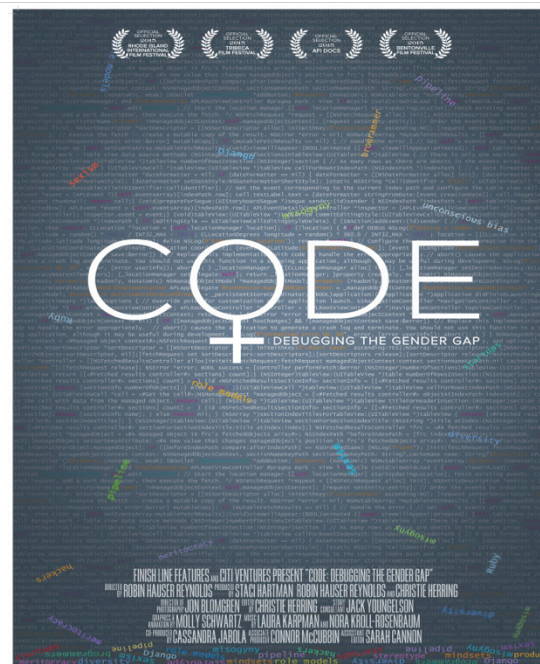
The NSTA Grumman Foundation Excellence in Engineering Education Award includes \$5,000 for classroom materials and a \$3,000 prize.



## Morristown High School's STEM Academy brings "CODE: Debugging the Gender"

**MORRISTOWN, NJ - CODE: Debugging The Gender Gap**, a free movie screening and panel discussion, took place on Thursday, Oct 6, 2016, 7:00 pm, at Morristown High School, 50 Early Street Morristown NJ. This program, made possible by a grant from the Morris Educational Foundation, explores the gender disparity in STEM-related fields and looks to promote these fields among young women in the community. Four successful women working in STEM fields participated in a panel discussion after the screening.

**Rachel Kim** a Civil Engineer at Moretrench, **Beth Krawczuk** and Internet Application Developer at LabCorp, **Adebisi Oje** an Application Developer at Microsoft and the Founder and CEO africode.org, and **Deb Takash** the Database Developer at StayinFront provided insight and answered audience questions. The percentage of women entering engineering has remained stagnant over the past 30 years, and the number of women entering programming has gone down. The Morristown High School (MHS) STEM Academy works to change this statistic, by supporting and promoting girls and young women in STEM careers such as engineering and programming. Beyond this event, MHS STEM supports all-girls engineering classes, unique experiences where girls can see STEM in action, and a Girls Who Code club.



"We are engaging a number of enthusiastic young women through the MHS Engineering Club, where we hope to spark their interest as well as support and validate them," said Mariel Kolker, Morristown High School Physics, Engineering, and Nanoscience teacher. "Often, I find that simply naming the problem helps to disempower it. When girls learn about implicit bias and stereotype threat, they see the world differently. They become empowered. "The CODE documentary exposes the dearth of American female and minority software engineers and explores the reasons for this gender gap and digital divide. The film highlights breakthrough efforts that are producing more diverse programmers and shows how this critical gap can be closed. CODE asks: what would society gain from having more women and minorities code and how do we get there?"

**Stay Tuned For Information on the Girls Who Code Summer Camp @ Morristown High School!**



## **Professional Mentor Program**

This year the STEM Academy continued it's weekly professional mentor series. This program brings in professionals, career counselors, college professors, and graduate students to work with our academy members building connections to post-secondary educational programs, careers, and internship opportunities. A special "thank you" goes out to all of this year's participants!

**Jack Rizzo – TSA Club/NJTEEA Teacher of the Year**

**David Postolski – Gearhart Law; Patent Attorney**

**Mariel Kolker – Mechanical Engineer; Con Edison**

**Deborah Spencer – Aerospace Engineer**

**Dr. Edwin Villhauer – Novartis Chemist**

**Ron Kilgore – Doosan Engineer**

**Dr. Brian Beyerall – Neurosurgeon**

**Dr. Gerard Begley – Oral Surgeon**

**Christina Doyle – Dietician/Healthcare**

**Chitra Venkatraman – Nokia Technical Manager**

**Mathy Stanislaus – EPA Office of Land Management**

**Christopher Haines – Picatinny Arsenal Nano Scientist**

**Shahram Dabiri – Picatinny Arsenal Engineer**

**Dave Katz – Picatinny Arsenal Aerospace Rocketry**

**Kristen Matthews – Dietetics Students at Montclair State**

**Lisa Brennan – Morristown Animal Hospital**

**Aasif Versi – Mechanical Engineering; University of Pennsylvania**

**Ben Hoshal – Biomedical Computer Programming; UC Berkeley**

**Robert Walton – JCP&L Electricity & Wind Turbines**

**Erin Colfax – Curious Young Writers; Science Journalists**

**Bill SanFilippo – Boy Scouts of America STEM Council**

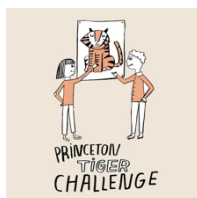
**Paul Droar – Biochemist Cambridge University**

**Christina Bifulco – Geotechnical Engineering; Rutgers University**

**Nicole Franco – Mechanical Engineering; Worcester Polytechnic Institute**

**Michelle Joseph – Student Global Ambassador Program**

**Jessica Park – Human Genetics Counselor at Stanford School of Medicine**



## Grants, Mentors, and Programs.....Oh My!

The MHS STEM Academy is proud to announce that the 2016-17 school year was its most successful to-date in terms of professional collaborations, co-curricular programs, and grant funding. Over twenty new partnerships were formed with local, national, and global institutions for our students including a total of seven co-curricular STEM clubs. In 2016 the STEM Academy received over \$64,000 in Grant Funding to support our instructional and curricular programs. The financial support allows the Academy to house state-of-art machinery and equipment to support newly developed learning spaces. Funding and professional support also contributes to the success of our STEM co-curricular programs and competitions. Currently the MHS STEM Academy clubs include: **Engineering Club, Rocketry Club, Environmental Club, Healthcare Professions Club, Girls in STEM Club, Girls Who Code Club, and the Technology Student Association Club.**

A very special "Thank You" to our own Morris Educational Foundation who is essential in terms of administering teacher grants along with coordinating lasting professional relationships.



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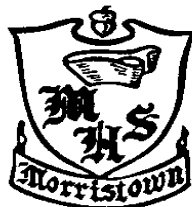
## Inaugural STEM Academy Class Celebrates Accomplishments

<i>Aldo Bangiola</i>	<i>University of Illinois</i>	<i>Computer Engineering</i>
<i>Caroline Barkemeyer</i>	<i>Drexel University</i>	<i>Architecture</i>
<i>Patrick Bauer</i>	<i>University of Miami</i>	<i>Entrepreneurship</i>
<i>Linnea Begley</i>	<i>Cornell University</i>	<i>Biomedicine</i>
<i>Anastasia Bergeron</i>	<i>University of Michigan</i>	<i>Entrepreneurship</i>
<i>Nicholas Bertha</i>	<i>UCLA</i>	<i>Civil Engineering</i>
<i>Jonathan Burke</i>	<i>UC San Diego</i>	<i>Environmental Engineering</i>
<i>Mark Capella</i>	<i>Villanova University</i>	<i>Chemical Engineering</i>
<i>Jacqueline Clemons</i>	<i>University of Michigan</i>	<i>Civil Engineering</i>
<i>Katherine Crofford</i>	<i>Rensselaer Polytechnic Institute</i>	<i>Biomedical Engineering</i>
<i>Theodore Droar</i>	<i>Boston University</i>	<i>Biochemistry</i>
<i>Jeremy Gibson</i>	<i>Georgia Tech</i>	<i>Computer Engineering</i>
<i>Clara Gong</i>	<i>Rutgers University</i>	<i>Nursing</i>
<i>Gianna Gonzales</i>	<i>West Virginia University</i>	<i>Psychology</i>
<i>Jack Hoeg</i>	<i>County College of Morris</i>	<i>Mechanical Engineering</i>
<i>Aiden Hoeman</i>	<i>Stevens Institute of Technology</i>	<i>Civil Engineering</i>
<i>Arjun Khadse</i>	<i>Georgia Tech University</i>	<i>Engineering</i>
<i>Erin Lade</i>	<i>Boston College University</i>	<i>Pre Law</i>
<i>Ryan Lade</i>	<i>Boston College University</i>	<i>Finance</i>
<i>Charles Lia</i>	<i>University of Michigan</i>	<i>Biology</i>
<i>Michael Macchia</i>	<i>NYU</i>	<i>Finance</i>
<i>Matthew Manion</i>	<i>United States Air Force Academy</i>	<i>Engineering</i>
<i>Kevin Marcato</i>	<i>Bentley University</i>	<i>Finance</i>
<i>Marina Matalon</i>	<i>Loyola University Maryland</i>	<i>Forensic</i>
<i>Katelyn McCreedy</i>	<i>Northeastern University</i>	<i>Health Science</i>
<i>Ian McCreedy</i>	<i>University of Maryland</i>	<i>Business Administration</i>
<i>Ada Patterson</i>	<i>Lehigh University</i>	<i>Computer Engineering</i>
<i>Olivia Perry</i>	<i>Virginia Tech University</i>	<i>Biology</i>
<i>Marina Piccolo</i>	<i>Haverford College</i>	<i>Biology-Pre Med</i>
<i>Daniel Ribaud</i>	<i>Worcester Polytechnic Institute</i>	<i>Computer Engineering</i>
<i>Kendall Rogers</i>	<i>Bowdoin College</i>	<i>Neuroscience</i>
<i>Mathew Rulon</i>	<i>Bucknell University</i>	<i>Environmental Engineering</i>
<i>Priya Sapra</i>	<i>Rensselaer Polytechnic Institute</i>	<i>Computer Science</i>
<i>Benjamin Schwartz</i>	<i>Lehigh University</i>	<i>Engineering</i>
<i>Caleb Septoff</i>	<i>The College of New Jersey</i>	<i>International Affairs</i>
<i>Maximillan Sporer</i>	<i>Princeton University</i>	<i>Physics</i>
<i>Giancarlo Soriano</i>	<i>Cornell University</i>	<i>Biomedicine</i>
<i>Michael Storch Jr.</i>	<i>University of Maryland</i>	<i>Civil Engineering</i>
<i>Carolyn Wong</i>	<i>Harvard University</i>	<i>Biomedical Engineering</i>
<i>Nathanael Yarger</i>	<i>Purdue University</i>	<i>Aerospace Engineering</i>

# MHS STEM ACADEMY

## Contact & Information

Applications for the 2017-18 school year will be released on October 2nd, 2017. Any eighth grade student who is interested in applying to the MHS STEM Academy is encouraged to download the "Information & Application" packet found on the school website as well as attend the annual Discover MHS night on October 12<sup>th</sup>, 2017. More information on the STEM Academy and Discover MHS night can be found on the Morristown High School Website at:



<http://www.morrisschooldistrict.org/Domain/8>

### STEM ACADEMY DIRECTORS

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Twitter: @MSD\_iSTEM

## Congratulations Class of 2017



Graduating Class of Morristown High School

Mennen Arena - June 22<sup>nd</sup>, 2017