THE FUTURE IS ...

# N.E.A.R.

NANOTECHNOLOGY EDUCATION AND RESEARCH

www.thefutureisnear.org


The Future is N.E.A.R. program offers the students of the North Penn High School Engineering Academy an opportunity to gain 21st century Science, Technology, Engineering and Mathematics skills that will help prepare them to become successful leaders in an ever-advancing technological society. The program introduces the fundamentals of nanotechnology, engineering research, and the application of knowledge to high school students while cultivating their interest in engineering, problem solving, and life-long learning.

This year, several of the research endeavors have given the students opportunities to research, design and develop solutions to global issues by capitalizing from the fundamentals of nanotechnology.

**TUESDAY, MAY 29TH, 2018**

**NORTH PENN HIGH SCHOOL AUDION**

**SEVEN O'CLOCK P.M.**

# 2017 - 2018 Engineering Design and Development
# Nanotechnology & Engineering Research Teams

**Welcome to the 13th annual North Penn High School Engineering Academy Nanotechnology and Engineering Symposium!**

The evening will begin at 7:00pm in the audion with introductions from each of the teams listed below. The students will bring you up to date with the research endeavors they have been performing throughout this school year.

Following their presentations, the evening will continue in the auxiliary gymnasium. The students will offer poster presentations, interactive demonstrations of their research, live electrospinning demonstrations, a live demonstration of a Hitachi TM3030 Scanning Electron Microscope, characterization equipment that was acquired from extremely generous grants from the Dow Chemical Company and the North Penn Educational Foundation and demonstrations from the North Penn NASA Research Team and the Engineering Projects in Community Service Club.

**BioSyn**
Aidan Daly, Daniel Trumpp, Zachary Warner

**EC Tint**
Colin Beatty, Tyler Ratliff

**PCM United**
Kurt Barclay, Jessica Niebuhr, Braxton Sweeny-Higley

**PiezoPOWER**
Tahsinul Huq, Matthew Knoebel

**Power Plant**
Stephen Hammond, Istiaq Rahman

**simVRT**
Connor Bryant, Ryan Munch, Ryan Winkworth

**Sunposite**
Kirollos Eskandar, Patrick Haley, Kevin Ung

**Synbionic Inc.**
Bryce Furek, Alexander Hotchkiss

**T.P.S. Energy Systems**
Mason Ahner, Jared O'Neill, Jacob Tarlo

**North Penn NASA Research Team**
Jake Holmberg, Satyam Patel, Camryn Russell

# ACKNOWLEDGEMENTS

**We would like to thank the following individuals, companies and organizations for their invaluable support:**

## North Penn High School

Mr. Todd Bauer, North Penn High School Principal
Bob Lanetti and facilities personnel, North Penn Facilities
Bob Gillmer and Craig Weierman, North Penn Communications Media
Nina Ferrant, Mark Keagy, Science Department
Denise Leach, Patti Sell, Maggie DeMarteleire
NPHS Art Department
NPHS Technology & Engineering Department, Mr. Curt Reichwein 3-D Printing

## Drexel University

Dr. Edward Basgall
Dr. Kapil Dandekhar
Joanne Ferroni
Dr. Frank Ko
Dr. Michele Marcolongo
Dorilona Rose

## Montgomery County Community College

Jean-Jacques Reymond

## Queen Elizabeth's Grammar School, Faversham, England

Dr. James Perkins

## Hitachi High Technologies and Angstrom Scientific

We would like to a give a special thank you to Robert Gordon of Hitachi High Technologies and Evan Slow, Liz Carter, and Justin Rack of Angstrom Scientific for their continued support! Much of our success is only possible because of the generous loan of the Hitachi TM4000plus Scanning Electron Microscope!

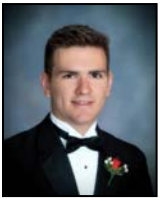
## North Penn High School Class of '62 Scholarship Committee

Joe Geiser, Thomas Strickland, Ray Moats, John Cairns, Dick Clemens, Aaron Rosenzweig, Lorna Pollock-Deiter, Maureen Bush Costello

A special thank you to the North Penn High School Class of '62 scholarship committee for their support of two senior scholarship awards and their assistance in establishing a community partnership for the students of the North Penn Technology and Engineering Education Department! Thank you!!!

**Mason Troy Ahner** T.P.S. Energy Systems

Mason will attend Virginia Polytechnic Institute and State University next fall with the intent to improve his experience in the field of engineering and mechatronic assemblies. He has assisted in the development of our competitive robotics team. His love for technology and design was sparked by his interest in LEGOs and the support of his parents.



**Kurt Patrick Barclay** PCM United

Kurt plans on attending Penn State University to pursue a degree in mechanical engineering. He has completed all five courses in the Engineering Academy and hopes to find a career as a mechanical engineer specializing in Aerospace. He has been interested in engineering since a young age and was inspired by his family and friends.

**Colin Matthew Beatty** EC Tint

Colin plans to attend Montgomery County Community College next fall and transfer to a four-year school to pursue a bachelor's degree in fire science. Since a young age, Colin has loved bettering the community, which he intends to do by landing a job as an arson investigator.

**Connor Nathaniel Bryant** simVRT

Connor has completed all five courses in the North Penn Engineering Academy. Next year, he will be attending Montgomery County Community College to further his studies in Engineering. He plans to continue his education to earn a degree in an Engineering major of his choice at a four year university.

**Aidan Jude Daly** BioSyn

Aidan Daly will be attending The Pennsylvania State University to study mechanical engineering and swim for the men's varsity team. Involved heavily in the engineering academy, Aidan has completed all six PLTW courses at the high school. In addition to engineering, Aidan has been playing water polo and swimming since freshman year.

**Kirollos Eskandar** Sunposite

Kirollos plans to enroll at Drexel University to earn a degree in Construction Management. He has been involved in the Engineering Academy since his sophomore year, completing all of the five engineering courses and also being involved the E.P.I.C.S club.

**Bryce Warren Furek** SynBionic Inc.

Bryce will be attending Drexel University for the 5 year Co-op program in Biomedical Engineering. He has been President of the E.P.I.C.S. club for one year and a member of the NASA Research team for two years. His love of engineering began when attending the Lego Robotics camp at North Penn. Bryce plans to start up his own Engineering Firm after graduating college.

**Patrick Lee Peter Haley** Sunposite

Patrick Haley is a North Penn senior who is involved in the Engineering academy, in which he completed all 5 courses. He will be attending Rochester Institute of Technology's five year program in order to obtain a degree in Civil Engineering Technology. Outside of school he is interested in playing basketball, working out at the gym, and running.

**Stephen Thomas Hammond** Power Plant

Stephen has completed all five of the Engineering Academy courses. He worked with Doctor Voicheck as an assistant in a LEGO robotics camp. This is what inspired him to want to become a teacher as well. Stephen plans on attending Millersville University for Technology and Engineering Education. He plans to hopefully return to North Penn and teach with his previous mentors.

**Alexander Vincent Hotchkiss** SynBionic Inc

Alex Hotchkiss will be attending Drexel for 5 years and plans to earn his degree in Biomedical or Mechanical Engineering. He has worked in the E.P.I.C.S club and NASA research team. If he pursues mechanical, he would go work for Disney and if biomedical would like to continue his research on artificial nerves.

**Tahsinul Huq** PiezoPOWER

Tahsinul has completed all 5 courses provided in the Engineering Academy at North Penn High School. He will be attending Drexel University starting in the fall of 2018 to major in Computer Science. He will be enrolled in the 5-year program at the university and wishes to continue his studies to complete his masters.

**Matthew Brian Knoebel** PiezoPOWER

Matt has taken all five of the Engineering Academy courses and will continue his education at Drexel University. He will be in the 5-year program majoring in Civil Engineering. He was a member of the Robotics Club during his sophomore and junior year, and Model Aviation Club his senior year.

**Ryan Michael Munch** simVRT

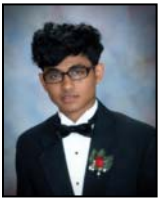
Ryan hasn't been one for sports after elementary school and has grown an interest in engineering ever since he was introduced to the Engineering Academy at North Penn High School. Next year, he will attend Montgomery County Community College to major in mechanical engineering.

**Jessica Eden Niebuhr** PCM United

Jessica will participate in Drexel University's 5 year Co-op Biomedical Engineering program. Having been President of the Auto Club for one year and Engineering Design and Development Independent Study, she has exhibited a strong passion for engineering. Jessica plans to become a doctor after graduating from Drexel and use her dual degrees to research cures for mental illness.

**Jared Patrick O'Neill** TPS Energy Systems

Jared O'Neill is going to Drexel University to earn a degree in Materials Science and Engineering. Jared participated in the EPICS club for two years and the Robotics club for three years. After graduating from Drexel University, Jared will pursue his passion in improving current technologies for harvesting clean energy.



**Istiaq Ahmad Rahman** Power Plant

Istiaq has completed all 5 Engineering courses in the Engineering Academy.
He will be attending Penn State Abington for two years with plans to transfer to the main campus for the last two years to complete his degree in chemical engineering.

**Tyler Ralston Ratliff** EC Tint

Tyler will be attending Penn College of Technology to pursue polymers and plastics engineering in the fall of 2018. Ever since he was very young, Tyler has enjoyed working with his hands and cannot wait to pursue a career that allows him to do so.

**Braxton Michael Sweeny-Higley** PCM United

Braxton is enlisted in the U.S. Navy for Nuclear engineering. He has always been into working with his hands. When he was younger, he would take apart his toys and put them back together just to see how they worked. He has completed all five courses in North Penn Engineering Academy.

**Jacob Redmond Tarlo** TPS Energy Systems

Jacob will be attending Montgomery County Community College for 2 years and then transferring to Temple University to earn a degree in Computer Science. He currently has two jobs in the STEM field and will continue to work in them during his college career.

**Daniel Andrew Trumpp** BioSyn

Daniel has completed all five of the courses in the Engineering Academy. He has been part of both the NASA research team and E.P.I.C.S club for two years. He will be attending The State University of New York at Buffalo to pursue a career in Mechanical Engineering.

**Kevin Ung** Sunposite

Although the quietest of the group, Kevin, having a bold vision of the future, is fascinated by science fiction genre, automotive, and cutting-edge technologies. Kevin will attend Montgomery County Community College to pursue Electronic Engineering with plans to transfer to Drexel University to continue his education.

**Zachary William Warner** BioSyn

Zachary has completed all of the five courses in the Engineering Academy. He will be attending Temple University to continue his education and pursue his career in mechanical engineering. Zach participates in ultimate frisbee, basketball, snowboarding, and many other sports in his free time.

**Ryan William Winkworth** simVRT

After completing all five courses in the North Penn Engineering Academy, Ryan will be attending The Pennsylvania State University, Abington campus, in the fall to pursue a degree in Mechanical Engineering. Ryan has had an interest in engineering since he was young. Beginning with a love for Legos, it has developed into a passionate field of study.

**North Penn NASA Research Team**

Jake Holmberg, Satyam Patel, and Camryn Russell have been performing research for two years designed to protect electronics from damage due to contact with liquids in space flight and other applications.

# NANOTECHNOLOGY EDUCATION AND RESEARCH

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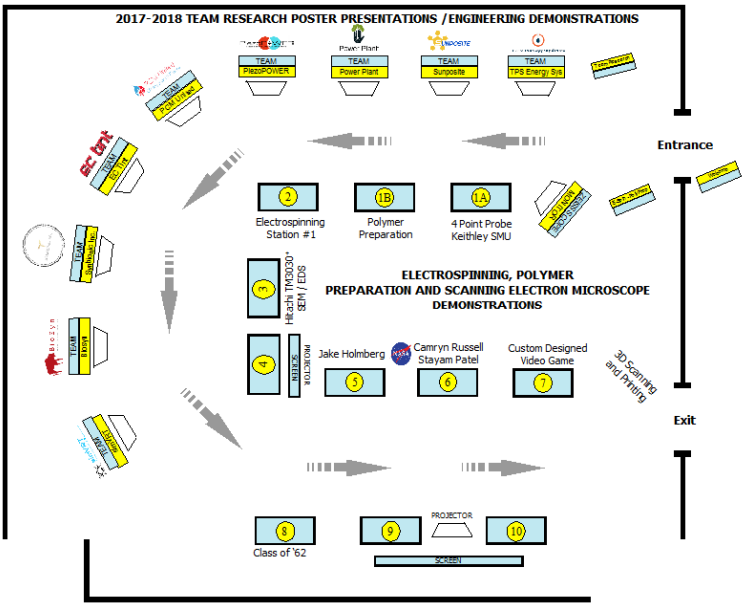


Please join us in the auxiliary gymnasium following the audion presentations for light refreshments, poster presentations, interactive demonstrations of the students' research, demonstrations of the electrospinning and polymer preparation processes, experimental characterization equipment that was acquired from an extremely generous STEM grant from the Dow Chemical Company, a custom designed video game, 3D scanning and printing and research performed by members of the North Penn NASA research team

**Be sure to also check out the Hitachi TM4000plus Scanning Electron Microscope that Angstrom Scientific has set up in the gymnasium!**

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