



THE FUTURE IS ...

N.E.A.R.

NANOTECHNOLOGY EDUCATION AND RESEARCH

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NP Technology & Engineering
Discover your Future



**NORTH PENN HIGH SCHOOL ENGINEERING ACADEMY
ENGINEERING DESIGN AND DEVELOPMENT
2020 VIRTUAL SYMPOSIUM
MAY 2020**



The Future is N.E.A.R. program (Nanotechnology Education and Research) at North Penn is a custom designed STEM education endeavor engaging senior Engineering Academy students in the exciting world of nanotechnology, experimental design, and engineering research.

Students work in design teams to research and develop solutions to global challenges by capitalizing from the fundamentals of materials science, engineering, and nanotechnology utilizing a combination of their own creativity coupled with some of the latest published research available.

The N.E.A.R. program is woven into the Engineering Design and Development course of the Project Lead the Way program here at North Penn. It offers our students an opportunity to gain essential 21st century skills that prepare them to become successful leaders in a global technological society.

2019 - 2020 Engineering Design and Development Nanotechnology & Engineering Research Teams

2020 Virtual Symposium!

This year, with the unfortunate events of the coronavirus, the 2020 Nanotechnology and Engineering Research Symposium at North Penn High School had to be cancelled.

The eleven research teams, composed of forty seniors of the North Penn High School Engineering Academy, were in the process of designing their experiments, purchasing the required equipment and materials, and preparing to run and collect data for their custom designed research endeavors!

Not to be stopped, with the purpose of contributing to the collective body of knowledge to solve their justified global problems, these Engineering Academy seniors worked from home to put together their 2020 Virtual Symposium!

The 2020 North Penn High School Nanotechnology and Engineering Research Symposium can be viewed on our research website at: www.TheFutureIsNEAR.org.

2019-2020 NORTH PENN HIGH SCHOOL ENGINEERING ACADEMY SENIOR CLASS



Battery Boot

Trey Evangelisto
Amanda Greaney
Tori Quinn



Only Air

Tommy Boyle
Nate Burnell
Alex Schrum



Carbon Gear Sportswear

Daniel Czekaj
Lizzie Kosten
Jamie Stewart
Thomas Waltrich



PhotoSynthetic Tech

Thomas Campbell
Tae Kim
Alisha Naik
Siddharth Poreddy



Carbon NanoCapture

Srikrishna Chakravarthi
Elliot Hong
Lucas Ratson
Brian Toto



Sense Dynamics

Aidan Iannetti
Mike Lopuszanski
Andrew Stevens



FRM

Matt Chambers
Grayden Griffiths
Charlie Holmes
Adam Zeenkov



SPECTRIC

Sydney Platt
Peter Yourl
Krik Kull
Cameron Walsh



Inter-Aid

Logan Ely
Logan Gillmer
Conor Hanrahan
Mit Patel



ThermoTheft

James Carnal
Jake Chaffin
Nasif Islam
Jaden Weed



MEDaxial

Aidan Blue
Nathaniel O'Brien
Moshiour Mondal

2019 - 2020 Engineering Design and Development Nanotechnology & Engineering Research Teams



Aidan Patrick Blue MEDaxial

Aidan will be attending Montgomery Community College and majoring in Computer Science. He has completed all five courses in the North Penn Engineering Academy, along with a course in AP computer science. He also was the vice president in the simulated gaming society. Aidan plans to go into video game design after college.



Thomas Paul Boyle Only Air

Thomas will be attending Montgomery Community College and plans to transfer to a university to pursue either Mechanical or Biomedical Engineering. Through the completion of the engineering academy, Thomas has learned a lot and many new problem solving techniques. He had the chance to create many new friendships and learned how to work well with others. The Engineering Academy also helped him realize he definitely wants to be an engineer.



Nathaniel Stephen Burnell Only Air

Nate will be attending Temple University in August and will be majoring in Psychology with a possible minor in Criminology. Through completion of the Engineering Academy, Nate learned a lot and met many awesome peers and staff that have made his journey at North Penn a blast. North Penn also showed him his true passion which is Psychology.



Thomas Ryan Campbell PhotoSynthetic Tech

Thomas Campbell will not be attending college. Instead, he will pursue an immediate career in the manufacturing industry. His completion of all 5 North Penn Engineering Academy engineering courses and major role in the International Research Team has helped to build his character and spark his interest in manufacturing. His passion for design and fabrication all came before high school, originating in his at-home workshop.



James William Carnal ThermoTheft

James Carnal will be continuing his education at The University of Tennessee where he will be majoring in Nuclear Engineering with a minor in Applied Music. Engineering has always been an interest of his that has been further cultivated by the engineering academy. Over his high school engineering career, James has been a part of the International Research Team, EPICS club, and the Model Aviation Club, to which he is president.



Jake Dominic Chaffin ThermoTheft

Jake Chaffin will be attending West Virginia University's Benjamin M. Statler school of Engineering and Mineral Sciences in the fall, where he will be majoring in Aerospace engineering. He's been fascinated by engineering and technology since he was very young. He has completed five courses in the Engineering Academy, was a part of the North Penn Model Aviation club for his Junior and Senior years at the high school, and participated in the Ski and Board club in his Sophomore, Junior, and Senior years.

2019 - 2020 Engineering Design and Development Nanotechnology & Engineering Research Teams



Srikrishna Nallan Chakravarthi Carbon NanoCapture

Srikrishna Chakravarthi will be attending the University of Pennsylvania where he will major in Electrical Engineering. Engineering has always been one of Srikrishna's main interests and his classes in the Engineering Academy along with his involvement in the International Research Team and Engineering Projects in Community Service club have shaped much of his high school experience. Srikrishna hopes to use all that he has learned at North Penn to make a positive impact through his career.



Matthew Vaughn Chambers FRM: Fire Resistant Materials

Matthew Chambers will be attending Montgomery County Community College for two years, then continue his studies at Penn State University. Being in the North Penn Engineering Program all three years of high school is an accomplishment Matthew prides himself in. Matt has chosen to pursue Computer Engineering as his major.



Daniel Jeffrey Czekaj Carbon Gear Sportswear

Daniel Czekaj will attend the Pennsylvania State University, where he is currently undecided on which major he will follow. He has found a serious passion for engineering through his four classes in engineering over the past three years at North Penn with the help of his teachers. He hopes to create the world's strongest yet lightest material in the world.



Logan Asher Ely Inter-Aid

Logan Ely is a senior in the North Penn High School Engineering Academy. This year, Logan performed research as a member of the Inter-Aid research team with the goal of developing novel thermoelectric nanofibers for advanced wound care.



James Evangelisto III Battery Boot

Trey Evangelisto will be attending Widener University to study Biomedical Engineering and to play football. Trey Has taken all five engineering courses at North Penn High School which has brought him to his passion in the world of engineering. Trey has also been involved with Mini-thon and the International Research Team at the high school.



Logan Joseph Gillmer Inter-Aid

Logan Gillmer will be attending Drexel University this upcoming fall semester in the five year co-op program in Engineering. He has taken four of North Penn's Engineering Academy courses, all of which sparked his interest in the engineering field. Logan is a part of the International Research Team and North Penn Television.

2019 - 2020 Engineering Design and Development Nanotechnology & Engineering Research Teams



Amanda Elizabeth Greaney Battery Boot

Amanda Greaney will be attending Lehigh University where she plans to study Biomedical Engineering. The five courses within the Engineering Academy have solidified her passion to design and create and she is so grateful to her engineering teachers for guiding her down this path. Along with her love of engineering is her love of softball. She was a captain of the softball team at North Penn and will continue her athletic career at Lehigh University.



Grayden Harrison Griffiths FRM: Fire Resistant Materials

Grayden Griffiths will be attending Pennsylvania State University where he will be majoring in Mechanical Engineering. Grayden's aspiration to become an engineer grew from taking three of the five offered engineering courses at North Penn. Outside of school he plays sports such as baseball and soccer.



Conor Patrick Hanrahan Inter-Aid

Conor Hanrahan is a senior at North Penn High school and will be attending Drexel University. He is passionate about engineering because innovating is important and it offers the ability to better the future of humankind. He is currently involved in the North Penn Auto Club. He is pursuing a degree in Electrical Engineering.



Charles Francis Holmes FRM: Fire Resistant Materials

Charlie Holmes has been taking engineering classes since 9th grade. Engineering Design and Development (EDD) sparked his interest in Materials Science and Engineering which has inspired him to work with his team members who share a similar interest to perform research in fire protection.



Elliot Soonhyuk Hong Carbon NanoCapture

Elliot Hong will be attending Pennsylvania State University where he plans to earn a degree in Materials Science and Engineering. He became interested in becoming an engineer after taking four courses in the engineering program at North Penn. Elliot is a member of NHS and the Korean club. He is skilled in violin and plays under the PYO organization. He hopes to continue playing during and after university.



Aidan John Christopher Iannetti Sense Dynamics

Aidan Iannetti will attend the University of Pittsburgh where he will major in Electrical Engineering. Throughout his time at North Penn, he has completed all six of the classes in the Engineering Academy. Aidan also was a member of the International Research Team and held a leadership position in the EPICS Club.

2019 - 2020 Engineering Design and Development Nanotechnology & Engineering Research Teams



Nasif Munjeem Islam ThermoTheft

Nasif Islam will be attending Penn State University with the intended major of engineering. The engineering classes throughout high school and middle school and all of his teachers have given Nasif the opportunity to learn how to make society a better place. Nasif is also involved with the engineering clubs at school but is still undecided in which intriguing engineering field to join.



Tae Il Kim PhotoSynthetic Tech

Tae Kim is planning to go into Electrical Engineering at Montgomery County Community College and then transfer to Temple University. Tae has completed all five courses in the engineering academy and this has been a big inspiration to him for pursuing a career in the engineering field.



Elizabeth Grace Kosten Carbon Gear Sportswear

Lizzie Kosten will be attending West Chester's Honors College where she will major in Business Management. She has completed all courses in the Engineering Academy. She hopes that her future business degree will lead her to a job in business engineering. Lizzie was also a captain of the girls' tennis team and participated in many clubs like NHS and EPICS.



Erik Lord Kull SPECTRIC

Erik will be furthering his education in Mechanical Engineering at the University of Utah. Erik comes from a lineage of engineers being that his father, all uncles, and grandfather pursued engineering as a career. The engineering classes that were provided at North Penn High School confirmed for Erik that the profession of engineering was best for him.



Michael Christian Lopuszanski Sense Dynamics

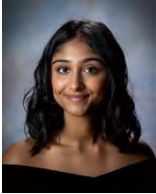
Michael will continue his education at Montgomery County Community College for two years and transfer to Temple University to major in Software Engineering. Michael's interest in engineering stemmed from the technology classes that he took in middle school and his interest increased as he went through four courses in Engineering Academy at North Penn High School.



Moshior Rahman Mondal MEDaxial

Moshior Mondal plans to attend Drexel University to study either Electrical Engineering or Materials Science and Engineering. Moshior's interest in engineering peaked from a young age as he would always be interested in how something would work and how to make it better. Moshior has completed five Engineering Academy courses. Moshior is a member of the Bengali Club, Muslim Student Association, Badminton Club, and much more.

2019 - 2020 Engineering Design and Development Nanotechnology & Engineering Research Teams



Alisha P Naik PhotoSynthetic Tech

Alisha Naik plans to attend The Pennsylvania State University to study Materials Science and Engineering. She hopes to work more closely with polymers and nanotechnology. Alisha has completed all five courses in the North Penn Engineering Academy. Her interest in engineering grew exponentially through this Engineering Design and Development course. Outside of school, Alisha enjoys making art, listening to music, and spending time with her friends.



Nathaniel Patrick Obrien MEDaxial

Nate will be attending West Virginia University to major in Mechanical Engineering. Nate's drive to become an engineer began at a young age always trying to make something new to solve the world's problems. The North Penn Engineering Academy further encouraged this drive, where he now plans to make his mark on that world as an engineer.



Mit S Patel Inter-Aid

Mit Patel is a senior at North Penn High School who plans to attend Drexel University. His passion for engineering started out at a young age and developed through his years within the North Penn High School Engineering Academy. He has been involved with the Model Aviation Club and plans to work within the aeronautical field.



Sydney Leigh Platt SPECTRIC

Sydney Platt will be attending Pennsylvania State University where he will be pursuing a degree in Electrical Engineering. Engineering has been a significant part of his experience at North Penn High School which led to a desire to follow a Research and Development career path after college.



Siddharth Reddy Poreddy PhotoSynthetic Tech

Siddharth Poreddy will continue his education by attending The Pennsylvania State University to pursue a career in Aerospace Engineering. Through the courses offered by the Engineering Academy, he found a love and passion for engineering. Siddharth is involved in a wide range of clubs ranging from E.P.I.C.S. Club to the National Honor Society, ultimately making the most of High School.



Tori Marie Quinn Battery Boot

Tori Quinn will be attending Widener University to major in Civil Engineering. Through taking five of the courses that the North Penn Engineering Academy offers, her love for engineering and her creativity grew. She is one of members of the school's International Research Team and is the President of the North Penn's Thespian troupe.

2019 - 2020 Engineering Design and Development Nanotechnology & Engineering Research Teams



Lucas Dajhan Ratson Carbon NanoCapture

Lucas Ratson will be attending Drexel University majoring in Materials Science and Engineering. Having completed five of the engineering academy courses and finding a passion in Material Science through the Engineering Development and Design course.



Alec Joshua Schrum Only Air

Alec Schrum is a senior in the North Penn High School Engineering Academy. This year, Alec performed research as a member of the Only Air research team with the goal of developing novel nanofiber-based air filtration media.



Andrew Edison Stevens Sense Dynamics

Andrew will be attending the Montgomery Community College with the intent to transfer to a four-year university to earn a bachelor's degree in cyber security. Throughout his years at North Penn, he has completed five courses in the Engineering Academy and has participated in the Track and Field team.



James Edward Stewart Carbon Gear Sportswear

Jamie Stewart will be attending the University of Drexel where he will major in Materials Science and Engineering. Throughout high school, Jamie has developed a passion for engineering while playing varsity soccer and volleyball and participating in the student government.



Brian Lawrance Toto Carbon NanoCapture

Brian Toto will be attending the Pennsylvania State University to study engineering. Brian has taken four classes in the Engineering Academy which has helped him with his decision to pursue this major. Brian was also involved in cross country, track, and the ski & board club, which are activities he hopes to continue in college.



Cameron Michael Walsh SPECTRIC Team

Cameron will be attending Pennsylvania State University this fall to pursue a degree in Architecture. He has taken four of the Engineering Academy courses and has been involved in the Model Aviation Club and International Research Team at North Penn. Through these programs, Cameron has developed a technical background that he hopes will enable him to succeed in his career.

2019 - 2020 Engineering Design and Development Nanotechnology & Engineering Research Teams



Thomas Joseph Waltrich Carbon Gear Sportswear

Thomas Waltrich is a senior at North Penn High School. Through his completion of the five courses of the Engineering Academy, he met several teachers that inspired and motivated him toward a future in engineering. Thomas will be attending Pennsylvania State University and majoring in Materials Science and Engineering.



Jaden Ryan Weed ThermoTheft

Jaden Weed has taken five of the six courses offered in the North Penn Engineering Academy. These classes have allowed Jaden to discover his passion for both engineering design and research. Jaden was involved in Odyssey of the Mind, Track and Field, and countless other clubs and activities. Jaden will be continuing his education at Pennsylvania State University, where he intends to major in either Material Science and Engineering or Computer Engineering.



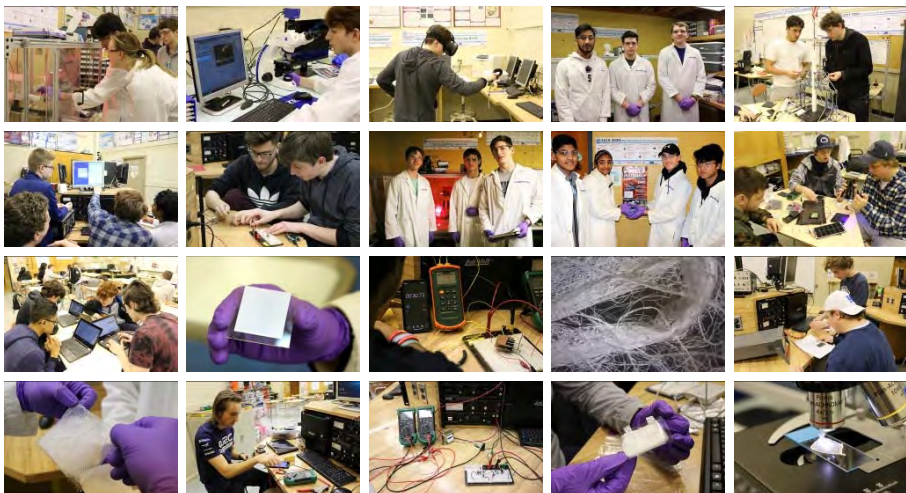
Peter Joseph Yourl SPECTRIC

From playing with Legos to Minecraft to now, Peter has been into engineering and design. When he reached high school, he entered the engineering family where he learned many skills from Mr. Boyer, Mr. Specht, Dr. Voicheck, and Mr. Reichwein. Peter is also a three sport varsity athlete. He will be attending Widener University next year where he will continue both his academic and athletic careers.



Adam Robert Zeenkov FRM: Fire Resistant Materials

Adam Zeenkov will be attending the University of Utah, majoring in Mechanical Engineering and plans on joining the SAE Formula Racing team. While at North Penn, Adam has completed five engineering classes, and is currently the Vice President of the Auto Club. Outside of school, Adam enjoys cars, skiing, and computers.



2019 - 2020 Engineering Design and Development Philly Materials Day @ Drexel University 02.01.20

North Penn High School Engineering Academy Seniors Present at Philly Materials Day @ Drexel University

On Saturday February 1, 2020, Drexel University, in partnership with the University of Pennsylvania, Boeing, Arkema, Johnson Matthey, The Franklin Institute and the Science History Institute held their 10th annual Philly Materials Day celebration.

This year, eighteen of the forty North Penn High School Engineering Academy seniors: Thomas Campbell, James Carnal, Jake Chaffin, Srikrishna Chakravarthi, Logan Ely, Trey Evangelisto, Amanda Greaney, Conor Hanrahan, Elliot Hong, Nasif Islam, Tae Kim, Alisha Naik, Mit Patel, Sidd Poreddy, Tori Quinn, Lucas Ratson, Brian Toto, and Jaden Weed, presented hands-on demonstrations of the materials science principles of their research to thousands of visitors in the Bossone Research Center at Drexel University from 10am to 3pm.

The students' research endeavors, made possible by generous grant funding from the North Penn Educational Foundation, encompass topics ranging from synthetic photosynthesis, carbon capture, advanced wound dressings, thermoelectric energy efficiency and piezoelectric energy harvesting.

The students shared their research with visitors of all ages and had the opportunity to network with the other presenters from Drexel University, The University of Pennsylvania, and local businesses.



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Piezoelectric Energy Harvesting

Trey Evangelisto
Amanda Greaney
Tori Quinn

The number of battery-powered electronic devices is rapidly growing, due to the fact that there are more devices than ever before. However, most of these devices are powered by batteries, which are not only expensive but also have a limited lifespan. Piezoelectric energy harvesting could have many benefits to both the consumer and the environment. Therefore, further research is necessary to make the vision for the green grid and make these portable devices more environmentally friendly.



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Carbon Capture

Srikrishna Chakravarthi
Elliot Hong
Lucas Ratson
Brian Toto

Nature, for millions of years, has acted as its own carbon sink through which carbon captures new carbon. However, with deforestation and growing human activities, carbon emissions are not being captured. Hence, carbon capture technology is required, which captures carbon dioxide and traps it. Carbon capture technology is required to reduce the carbon footprint and to reduce the carbon footprint. This technology is required to reduce the carbon footprint and to reduce the carbon footprint.



**NORTH PENN HIGH SCHOOL
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Advanced Wound Dressings

Logan Ely
Logan Gilmer
Conor Hanrahan
Mit Patel

Doctors get cut, broken, torn, and burnt. It takes patients each year in the United States alone are affected by chronic wounds, which do not heal. These wounds are painful and can be very difficult to treat. Infer-Bid is a new type of wound dressing that can help heal these wounds. Infer-Bid is a new type of wound dressing that can help heal these wounds. Infer-Bid is a new type of wound dressing that can help heal these wounds.



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Artificial Photosynthesis

Thomas Campbell
Tae Kim
Alisha Naik
Sidd Poreddy

Plants are amazing for their ability to convert sunlight into energy. However, the absorption rate of light is not 100%. Scientists are working on creating artificial photosynthesis, which can capture carbon dioxide and produce energy. This technology is required to reduce the carbon footprint and to reduce the carbon footprint. This technology is required to reduce the carbon footprint and to reduce the carbon footprint.



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Electronics Thermal Management

James Carnal
Jake Chaffin
Haqi Islam
Jaden Weed

Thermofix is a new type of thermal management material that can help cool electronic devices. This technology is required to reduce the carbon footprint and to reduce the carbon footprint. This technology is required to reduce the carbon footprint and to reduce the carbon footprint.



“A vision without resources is just a hallucination...”

Dr. Joseph DeSimone, 2008 Lemelson –MIT Prize Recipient

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The North Penn Educational Foundation

None of our research would be possible without the amazing support from the North Penn Educational Foundation!!! Thank you!!!!

