

2025 STUDENT POSTER PROGRAM

TUESDAY, APRIL 15, 9:00 AM - 4:00 PM – NILES ROOM I & II

Thermal Management Performance Testing of Microchips and Sensors for EVs - Bary Simpson

Aerogel Based Coatings to Prevent Fires in Electric Vehicles - Curtis Towns

Plastic Welding Applications for EAVs - Braylon Lattner

3D Printed FilaFlex Foam for EAV Applications - Adonis Williams

Use of Carbon Fiber Materials in EV Manufacturing - Jking Blackmon

Recycling Plastic Parts from 3D Printer Waste Material to Make EAV Replacement Parts - Aisiah Young

Improving Vision Systems in EAVs to Reduce Pedestrian Accidents - Mark Bell

Using Solar Panels to Charge Electric Vehicles - Kasey Harrell

Multi-Unit Charging Stations for EAVs - Jaylon Profit

Use of Generative AI for Smart Mobility Systems Development - Cameron Pressley

1:30 - 3:30 PM: JUDGING – NILES ROOM I & II

3:30 PM: AWARDS – EXHIBIT HALL

POSTERS

2025 PLENARY PRESENTATIONS



WEDNESDAY APRIL 16 – DENNISON ROOM

10:00 AM Public-Private Partnerships: Creating an Investment Model for the Development of Future STEM Leaders in Michigan

Ralph Bland, Superintendent and CEO, New Paradigm for Education, Detroit, Michigan

There is a critical shortage of skilled young people to fill the demanding jobs of today. STEM careers are driving today's economy, ranging from electric vehicles to robotics and advanced agriculture. The gap that business leaders and the education community are still grappling with is how to develop, invest in and sustain a pipeline that will provide the talent needed for American companies to remain competitive on the world stage. The importance of public-private partnerships in STEM, Creative Models used at NPFE to attract STEM investment and Best Practices in STEM talent development for the future workforce in sustainability are highlights of this keynote speech.

Ralph C. Bland began his career in education as a 1st grade teacher at an all-boys academy in Detroit Public Schools. Since then, he has served as a teacher, coach, principal and superintendent. Under his leadership, Detroit Edison Public School Academy (DEPSA) was the first charter school in Michigan to be named a Michigan Blue Ribbon School and is consistently the city's highest performing PK-8 school, also outpacing state-level academic performance. In 2010 Mr. Bland Co - founded New Paradigm For Education (NPFE) to expand the DEPSA instructional model across the region, ensuring access to a rigorous world-class education for thousands of Michigan scholars. Mr. Bland has received the Boys and Girls Club of Southeastern Michigan 3C Partnership of the Year Award in addition he has also received the Robert F. Kennedy Urban Education Award.



10:30 AM The Innovus Story: Innovation, Creativity, Curiosity and Partnership

Robert Hemley, Executive Director, Innovus Innovation Center, Altamonte Springs, Florida

Innovation starts with curiosity. Future engineers and scientists may lack this critical asset for problem solving through traditional channels of learning. Thus, there is a need for creative thinker to grow and flourish. This will lead to the creation of a wider range of ideas, concepts and solutions over a shorter timeframe. To realize this goal, the tools, processes and culture need to be aligned. Innovus Innovation Center, in partnership with world class collaborators such as Ecotek Lab, have developed a model for cultivating the next generation of leaders in STEM through hands-on investigation and research. During this session, you will learn about the 5 key success factors to leveraging human capital in the K-20 pipeline to empower future engineers working on the next generation of electric and autonomous vehicles.

Robert Henley is the Director of Innovation for the Florida Conference of Seventh-day Adventist School System and the founding director of the Innovus Innovation Center in Altamonte Springs, FL. He also serves as the Associate Director of the Loma Linda University EXSEED Program and an Adjunct Instructor at the Southern Adventist University School of Education. Additionally, he is the founder and CEO of STEM Cubator, a STEM education company. With over 30 years of experience as STEM+C educator in the K-20 space, Robert specializes in mechatronics, biomechatronics, physical computing, AI/machine learning, and computational chemistry. His students have founded startups and conducted cutting-edge STEM+C research. Mr. Henley holds a Master's degree in Teaching from Andrews University in and a Bachelor of Science in Biology with a minor in Chemistry and a concentration in Computer Science from Oakwood University, in Huntsville, Alabama.

2025 GENIUS TALKS



WEDNESDAY APRIL 16 – DENNISON ROOM

11:00 AM Sustainable Bio-foam for EV Seating

Corey McKenzie, Michigan State University

Sustainability is no longer an option. It is required. The automotive industry is moving quickly to address gaps in its sustainability infrastructure through a wide range of innovations. Bio-foam is a sustainable material that provides a wide range of ecological and mechanical efficiency benefits. In this session, you will learn about the creative options for lignin in EV seating design.

Corey McKenzie is a freshman at Michigan State University majoring in Forestry. He is an alum of Ecotek Lab- Class of 2024. Mr. McKenzie has been actively involved in SPE youth programming since the 11th grade. Mr. McKenzie is currently working as an undergraduate in the bioproducts lab at Michigan State University where he specializes in the design and development of sustainable materials for a wide range of applications.



11:15 AM Pet Friendly Car Seats in EVs

Zhanyla Coley, Michigan State University

What do you think when you see a pet hanging out of the window or sitting in the lap of its pet parent. This is not safe. Is it comfortable for them or is a new experience that requests some getting use to? One area that is often overlooked with the design of electric cars is the animal friendly transport features. In this session, you will learn about a creative way to make EVs more pet friendly.

Zhanyla Coley is an alum of Ecotek Lab-Class of 2024. She is majoring in pre veterinary medicine at Michigan State University. She is the Chief Innovation Officer of Petrix. Ms. Coley is a thought leader in how to safely transport domestic animals on airplanes, trains and in cars



11:30 AM Using Engineering Solutions on the ISS to Improve EV Technology on Earth

Alexander Graham, Renaissance High School

Managing energy in space is a complex activity. Engineers at NASA and SpaceX have developed ways to ensure that the International Space Station is always operational and has the proper amount of energy to keep working. What if, we could take best practices for energy storage in outer space to improve how EV charging stations and materials are developed on Earth. This session will involve the discussion and simulation of ways to make this dream a reality.

Alex Graham is a 12th grader at Renaissance High School and a senior student researcher at Ecotek Lab. Alex has a deep understanding of EAV charging systems. He has worked as an intern at the Wayne State Battery Technology lab. He has also been actively involved in SPE since the 9th grade.



11:45 AM NeuroShield: Rethinking EMF Safety in EVs

Preethi Parthasarathy, International Academy East

Electric vehicles are the all the rave when it comes to fighting climate change and reducing our dependency on fossil fuels, but have we considered the risk we have to dangerous electromagnetic fields that pulse throughout an EV. What if we could use a “Anti electromagnetic wave aluminum foam material” to prevent the harmful impacts of EMFs. In this session, you will learn about how anti-electromagnetic wave material may be the answer to our EMF problems

Preethi Parthasarathy is a 11th grader at International Academy East High School in Troy, Michigan and a senior student researcher at Ecotek Lab. Preethi recently participated in the 2025 Junior Science and Humanities Symposium and she is a nominee for the 2025 US JSHS Scholars Award in Stem Research. She is passionate about biomedical engineering and data science. Preethi is involved in public speaking forums where she shares her ideas on science and leadership best practices.

12:00 PM GENIUS TALKS AWARDS – DENNISON ROOM

2025 STUDENT PRESENTATIONS



WEDNESDAY APRIL 16 – DENNISON ROOM

1:30 PM Machine Readable Signage to Support Autonomous Vehicle Operation

Amir Muhammad, Renaissance High School

Use of autonomous vehicles is increasing. The need to make changes to how they operate on highways and streets will require changes to how signage is designed and what materials are used. There is an opportunity to develop machine readable traffic signs. In this session, you will learn about how 2D QR codes can be used to support autonomous vehicle navigation in urban communities.

Amir Muhammad is a junior at Renaissance Academy and a senior researcher at Ecotek Lab-Detroit. He is the co-chair of the 2025 Sustainability Conference. He has been engaged in SPE related activities from essay writing competitions to presentations at the annual TPO conference. He is also heavily involved in additive manufacturing and robotics. He recently participated in the Michigan Regional Junior Science and Humanities Symposium where he presented his research on the use of additive manufacturing of aerospace replacement parts.



2:00 PM The Future of Mobility: Using Modular Nuclear Energy Reactors to Power EV Charging Stations

Destiny Taylor, Central Michigan University

Electric vehicles (EVs) produce zero carbon emissions, but their environmental impact depends on how they are charged. Currently, the grid is powered by 59.9% fossil fuels and 18.6% nuclear energy. Shifting to more nuclear power could significantly reduce emissions. Nuclear energy is efficient, with a small amount of uranium producing as much energy as large quantities of fossil fuels, and it contributes zero carbon emissions, unlike fossil fuels, which account for 75% of climate change.

Ms. Destiny Taylor is a junior at Central Michigan University majoring in Chemistry. While in high school she participated in SPE competitions and conducted research on bioplastics. Ms. Taylor worked as an intern in the nuclear energy department last summer at Constellation Energy in Illinois. This summer she is working in the nuclear operations division at Constellation Energy's nuclear energy plant in Pennsylvania. She is an alum of Ecotek Lab. Class of 2022.



2:30 PM Using the Energy Transfer Ecosystems Found in Forests to Design a More Sustainable High Capacity Energy Storage System for EVs

Dyllan Nelson, Michigan State University

EV charging systems are important to the growth of the industry. There are a lot of challenges with EV capacity charging and charge retention. But what if there was a way to use super capacitors to improve the range and operational efficiency of an EV. One place to look to how energy storage has been perfected is the forest ecosystem. In this session, you will learn how EV material engineers can design sustainable capacitors from forest related feedstock.

Ms. Dyllan Nelson is a junior at Michigan State University majoring in forestry. She is an alum of Ecotek Lab-Class of 2022. She travels the world learning about subsystems in nature and how they work together. Last summer, Dylan worked as a research intern in the Harvard Forest. She has also worked in the bioproducts lab at Michigan State University where she focused on developing and testing concepts related to lignin biofeedstocks.

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3:00 PM PEEK: Sustainable Plastic Fabrication of Semiconductors Used in EVs *Wei Yang and Alejandro Bracho, NEOCITY Academy-Florida*

Plastic components are used to manufacture semiconductors and microchips that are used in electric vehicles. Having the right balance of materials and design can make a microchip more efficient and lead to high performance. In this session, you will learn about how students at Ecotek Lab are investigating the benefits of PEEK a high thermal material that can be 3D printed to manufacture semiconductor components or electric vehicles.

Wei Yang and Alejandro Bracho are juniors at NEOCITY Academy, the number one STEM high school in Central Florida. They are also senior student researchers at Ecotek Lab-Orlando. Both Wei and Alejandro maintain a GPA of 4.5 and are engaged in a wide range of engineering research related to semiconductors and mechanical engineering. They worked on a team to develop a Continuous Liquid Oxygen Tracker (CLOT), which implemented the use of ultrasonic sensors and sound waves to capture the fluid buildup image inside of the lung through an online application. Alejandro is the current president for the technology Student Association (TSA)-Central Florida region.



4:00 PM Use of Red Phosphorus to Avoid Fires in Electric Vehicles *Paul Garrison Jr., Renaissance High School*

Electric vehicle fires are a problem for public safety and can be difficult to extinguish. Engineers around the world are working to develop a solution through the design of more fire retardant materials. In this session you will learn about the benefits of red phosphorous as a fire suppressant in electric vehicles.

Mr. Paul Garrison Jr is a junior at Renaissance High School and a senior researcher at Ecotek Lab-Detroit. He has been actively involved in SPE since the 8th grade. Paul recently earned a spot in the National Junior Science and Humanities Symposium in Washington DC. Last summer he traveled to Milan, Italy where he participated in an international exchange program for future leaders in STEM.



4:30 PM Use of Aerogel Reinforced TPO Foam for Sound Suppression in Vehicles *Lael Harris, Mount Clemens High School*

Sound pollution can be a problem in vehicles. Engineers in the material science industry are working to develop viable solutions to reduce sound leakage in vehicles. For an electric vehicle, controlling sound leakage can be challenging. In this session you will learn how aerogel reinforced TPO foam can help with sound suppression.

Ms. Lael Harris is a sophomore at Mt Clemens High School and a junior researcher at Ecotek lab-Detroit. She has participated in several SPE related activities to build up her knowledge of plastics in the automotive field. She placed first at the 2024 TPO Conference in the Student Poster competition for her work on sound suppression innovations. Her goal is to be a mechanical engineer. She loves working on robotics and computers in addition to materials engineering.

5:15 PM STUDENT PRESENTATION AWARDS – DENNISON ROOM

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