



SPEC *Sheet*

SOCIETY OF PLASTICS ENGINEERS – CLEVELAND SECTION

May 2018 Vol. 61 No. 9

www.specleveland.org

Editor: Craig Potter

Education Awards Dinner: May 21, 2018



Meet this year's scholarship and Science Fair Award winners – Jeremy Stark, Caroline Pier, Isabella Davis and Tanish Makadia. Students will present a poster session and be available for questions and further discussion.

Location:

D'Agnesse's
1100 W Royalton Rd
Broadview Heights OH
440 237 7378

Quick Clicks:

[Directions to the Meeting](#)
[President's Message](#)
[SPE Board – Officers](#)
[SPE-Cleveland Website](#)

Agenda:

5:00 Board Meeting
5:30 Student Arrival and set-up
6:00 Dinner
7:00 Awards Presentations following dinner

Price: Menu pricing – on your own.

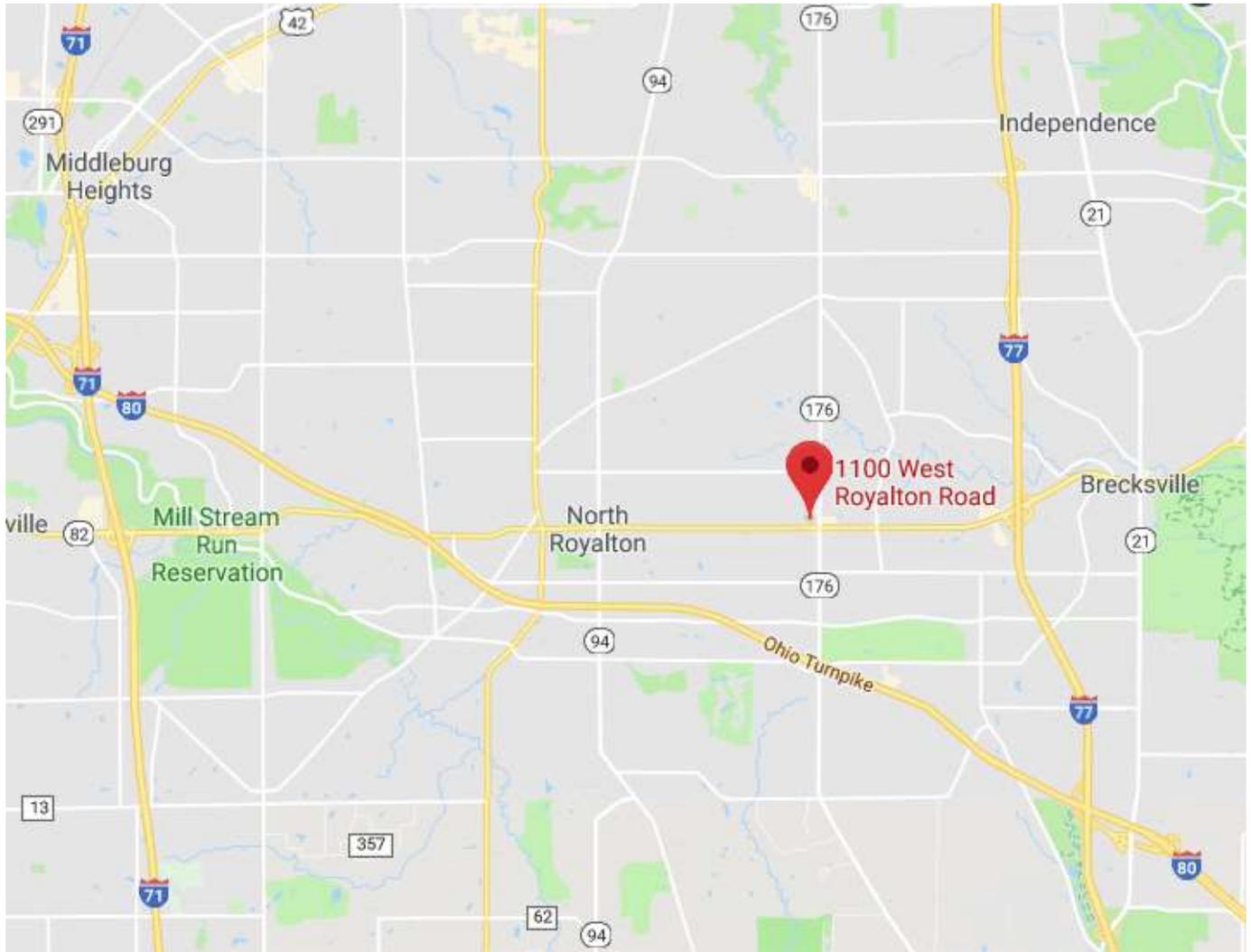
Reservations:

Reservations must be made by noon on Friday May 18 to Dan Crist at 440 227 5424 or to mail@cmd-tip.com.

Directions to May 21st Meeting

D'Agnese's Broadview Heights

[1100 West Royalton Rd, Broadview Heights OH](#)



May President's Message



I would like to thank everyone in the organization for a great year. The support of the Board members and the membership in general has made this year productive as a planning and rebuilding year for the organization.

Cleveland SPE has made ourselves a viable option for SPE Division TopCons and other independent trade organizations. We have strengthened our resolve to build the section with our veteran members' expertise, our younger members' vitality and input from the local industry as a whole.

We have secured commitments for future TopCons and industry conventions and we have events ready for next season to build relationships with students at local universities. We also have additional ideas ready to execute to bring more youth and expertise into the section as a future resource. I hope that you will join us again next season for our fantastic events, networking and to grow the plastics and polymer industry around us.

As always, I want to extend an invitation to any members that are willing to lend their talents to the Board of the Cleveland Section. We have open positions and we are always looking for new energy and ideas to help our efforts. Thanks again for a great season and I hope to see you at a future SPE Cleveland Section event.

Ron Raleigh
President
SPE Cleveland

2017 - 2018 SPE Cleveland Education Awards

**Recipient of 2018 SPE Cleveland
Section scholarship for plastics
technology:**

Jeremy Stark, Indiana University-
Purdue University Indianapolis



Jeremy recently graduated from Orange High School in Pepper Pike, Ohio and is now a freshman at Indiana University-Purdue

University Indianapolis. He is pursuing a bachelor's degree, and eventually a master's degree, in Mechanical Engineering. Some of his interests outside of school include cars, photography, videography, saxophone and guitar.

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Recipient 1st Place 2018 NEOSEF Student Papers Awards winner

Caroline Pier, St. Vincent-St. Mary High School

Title - Poly(ester urea)s for in-Vitro Applications



Abstract - Over the past few decades, biodegradable polymers have been extensively studied as resorbable materials for vascular tissue engineering applications, however, concerns have surfaced such as localized pH drop, cytotoxic byproducts and mismatched mechanical properties which has led to controversy in applied medical delivery systems. Poly(ester urea)s derived from α -amino acids are promising for vascular tissue engineering applications because they exhibit steady, consistent, and controlled degradation patterns, are non cytotoxic and exhibit excellent shape memory. This study was planned to tune the mechanical properties of poly(ester urea)s for devices for minimally invasive surgery, tissue engineering scaffolds, and drug delivery systems.

The main components of the poly(ester urea)s structure are carbon chain diols, amino acids valine and phenylalanine and ester bonds. By increasing chain diol length in the monomer, the amount of flexible segment on the polymer structure increased, which in turn decreased the elastic modulus and increased the degradation rate. By using poly(ester urea)s with larger percentages of phenylalanine, the stiffness of the material increased and the degradation rate decreased because the double bonds in phenylalanine's carbon ring create a more rigid structure and the carbons are hydrophobic which slows the rate of water's contact with the ester bond. The ester bond is the site of degradation in which the ester bond will cleave due to the reaction with water, resulting in the release of drugs. In conclusion, poly(ester urea)s exhibit characteristics that make them promising candidates as the drug delivery system of the future.

Biography - Ms. Pier will graduate from St. Vincent- St. Mary High School in May 2018. She is the Team America Rocketry Challenge captain at her school, the Varsity Tennis Captain and Student Council Representative. She has participated in several research projects for the last three years at the University of Akron and competed for her school's Model United Nations team. She plans to attend The Ohio State University in the fall and will be studying Data Analytics and Biochemistry in the Honors Program.

Recipient 2nd Place 2018 NEOSEF Student Papers Awards winner

Isabella Davis, St. Vincent-St. Mary High School

Title - The Effect of an Olefin Ionomer of Zinc-Neutralized Poly(ethylene-co-methacrylic acid) Shell and a Polycarbonate Core Filament on the Printability and Strength of a Complex Structure



Abstract - How does an olefin ionomer of zinc-neutralized poly(ethylene-co-methacrylic acid) (PEMA) shell and a polycarbonate core filament affect the printability and strength of a complex structure. ABS and polycarbonate are common thermoplastics used in 3D printing. Although both are durable options, they have limitations caused by weak intermolecular bonds. The third group consists of a polycarbonate core and PEMA shell. As the polycarbonate solidifies, PEMA remains a liquid, forms ionic bonds and crystallites between layers of filament, and allows the polycarbonate to shrink without damaging the structure. Without the polycarbonate core, the PEMA would not be able to form a set shape due to the low crystallization and glass transition temperature and, consequently, the slow solidifying process. Tensile tests were conducted to compare the filaments' strength. To test printability, a rocket fin was printed, and then compared with the computer design. From the tensile test, the core shell had the longest elongation, which means it could withstand the most amount of force. For the printability test, the core shell printed most similarly to the computer design. Because the crystalline domains and ionic aggregates in the shell promote the strength at the interface while the polycarbonate provides thermal stability as it solidifies at a higher temperature during printing, the material was able to withstand the most force without breaking and print without deformations.

3D printing has endless possibilities from the medical field to architecture. This information could help prevent 3D printed parts from breaking easily or deforming during printing.

Biography - Ms. Davis attends St. Vincent-St. Mary High School as a sophomore. She is a member of several clubs at STVM such as Environmental Club, of which she is the co-President, the French Club, Art Club, World Nutrition Club and Mu Alpha Theta. She has also made the Principal's List both her freshman and sophomore years. She enjoys painting and playing tennis with friends and works on a hydroponic farm to earn money for a trip to France. She hopes to study in the science and art fields at college.

3rd Place 2018 NEOSEF Student Papers Awards winner

Tanish Makadia, Lake Ridge Academy

Title - Thermoplastic Composites Using Carbon Fiber



Abstract - Carbon fiber composites are used nearly everywhere - from automobiles, planes, golf clubs and even musical instruments. They boast high strength while maintaining low weight. This project tested carbon fiber composites with different thermoplastic matrices to see if there was a correlation between the matrix and the composite made from it. The hypothesis was, if the tensile strength of the thermoplastic matrix is high, then the tensile strength of the resulting composite will also be high, because the properties of a composite depend on its constituents. To test the hypothesis, various carbon fiber composites were made using three different matrices and tested for tensile strength. These matrices were polyvinyl chloride, polycarbonate and polyester. Additionally, glass fiber was used as a reinforcing agent as a follow-up, to see if the data would remain consistent. It was found that polycarbonate film had the highest tensile strength of 9296 PSI and those composites also had the highest tensile strength. The hypothesis proven to be true, as the properties of the matrix directly correlated to the properties of the composite made from it.

Biography - Mr. Makadia's highest interest is in the tech field where he enjoys coding and graphic design. He plans to take honors computer science and software development in high school as well as Engineering classes for CAD and Design and Fabrication. Art and design are passions of his and is planning to combine them into concept art that can then be applied to a technology. Hopefully this will lead to a successful college experience.



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Upcoming Conferences and Events:



**Cleveland Ohio – September 18 – 20, 2018
Cleveland Convention Center**

The Extrusion conference is the only conference devoted to all aspects of extrusion processing!

Conference presentations consist of general sessions devoted to technical and business issues common to all types of extrusion, followed by breakout sessions devoted to specific types of extrusion: Film, Sheet, Pipe/Profile/Tubing, and Compounding.

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Conference details are available at this link - <http://www.extrusionconference.com/>
Watch this site and newsletter for a \$100 session discount for SPE Cleveland members.



THERMOPLASTIC ELASTOMERS CONFERENCE 2018



September 18-20 | Akron, OH

With a history of successful conferences behind them, SPE'S Akron Section and the TPE Special Interest Group host the 13th Thermoplastic Elastomers Conference at the Hilton Hotel in Akron, OH, September 18-20.

FEATURING

- **Half-day Primer** on TPE Basics, September 18, prequel to the main conference
- **Presentations:** Bio-renewable Materials, Wearable Technology and, of course, Materials, Modifications and Development. Processing and Scale-up will also be addressed.
- **2 Keynote Speakers:** Quizar Hassonjee (President, Hass Tech Associates) shares information about Smart Textiles and Christine Hockman, (Co-Director, Great Lakes Biomimicry) addresses the subject of Biomimicry
- **Exhibitor booths** and two evening **networking socials**

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QUESTIONS?

Conference: William Blasius - +1 774-545-0990 or Vivian Malpass - +1 330-342-1120

Sponsor/Exhibitor: Kevin Malpass - +1 330-398-9411

Go to <http://www.4spe.org/tpe18> for conference pricing and discount for SPE members

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Minutes from Board meeting, April 9, 2018

In Attendance:

Dan Crist (House), John Sovis (Treasure), Craig Potter (Advertising, Newsletter), Bob Opalko (Secretary), D. Meade (Education, Awards), R. Raleigh (President), J. Blayne (Councilor), T. Waddle, G. Zhang

Minutes

The IM group has not picked a venue yet for the Injection Molding TOPCON in November 2018, but we expect a response after NPE 2018 (in May).

For the Extrusion TOPCON in September 18-20, 2018 at the Cleveland Convention Center, members agreed to post a "Save the Date" in the April Newsletter, and the registration discount code in the May Newsletter.

Members discussed having future meetings at CASE, combined with a student mixer, with a speaker from industry talking about the business side of the plastics industry. We will propose having Dwight Morgan (MA Hanna, PolyOne, ACCEL Color, M. Holland) present on 10-26-18, a typical night for the student mixer. G. Zhang will contact Dr. Ishida.

For the CAD RETEC (9-23 to 9-25-19), we have tabulated that there are 19 CAD members in the SPE CLE section. We will get a \$100 credit for each member that registers, and board members agreed to advertise the event in our Newsletter.

There will be Board meetings at the NPE on the evening of 5-8-18. T. Waddle will attend CAD, C. Potter will attend Extrusion and J. Blayne will attend Injection Molding.

For the combined society event at JCU in May, we have been asked to provide 3 presenters. R. Raleigh will announce this at tonight's meeting. Abstract deadline is 4-27-18.

For the CTSC Young Professional Scholarship Award event (5-7-18), members D. Crist and/or D. Meade may attend (\$50/member). With the registration fee, we are allowed 1 table

The CLE Section of the SPE Student Award Event will be at 6PM on 5-21-18 at D'Agnese's in Broadview Hts. The Board of Directors meeting will precede this at 5PM, and members agreed to elect a new President for our section that night.

Treasurer: J. Sovis distributed the financial report, which the members accepted. He has arranged for a direct payment to Bruce Bille.

Advertising: C. Potter distributed the metrics of the SPECleveland.org website from B. Bille, which indicated a very high number of visitors. C. Potter noted that the newsletter now features a new type font that looks cleaner. He also solicited a year-end wrap-up message from R. Raleigh.

Councilor: J. Blayne distributed his report, highlighting that the national SPE is in the best financial condition since 2000, mainly due to the publication fees that we receive from Wiley. This is somewhat offset by lower paid membership dues (free members have increased) and lower event income.

House: We had 36 attendees for tonight's presentation by Eve Vitale.

Membership: Li Nie reported that 3 new members have joined, 0 have dropped and 1 has re-joined the CLE section. Total active members stands at 141.

Education: D. Meade and R. Raleigh were judges at the Cleveland Science Fair on 3-13-18, and noted that 2 winners were from Akron St. Vincent / St. Mary.

Members agreed not to participate in Plastivan in 2018, and that we should target vocational students next season.

Program: J. Sovis noted that he is targeting tours for the months of September, November and March. We are contacting Design Molded Plastics.

April program Eve Vitale –Director of SPE Foundation:



Ms. Vitale works for the SPE Board to connect plastic professionals with various agencies for workforce development.

One of her responsibilities is Plastivan, which promotes plastics to high school students. There are six educators in the program and 9000 students attended in 2017. The van costs \$1750/day for the school.

Funding can consist of Donations, SPE Foundation and local sections and covers educator travel, supplies, etc.

Other projects include: Lead the Way which promotes manufacturing to students via robotics, 3-D printing, etc, and Advocates for Plastics Careers in America (www.moldingthefuture.org) which connects students with professors, other students with experience in this field and schools that specialize in this education.





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2018-2019 Program Schedule:

Next season's schedule is under construction with plant tours and fascinating speakers planned. The complete schedule will be issued in the September '18 edition. Meanwhile, keep the second Monday of September through April marked for our SPE programs.

Sponsors and Advertisers:

Thanks again for your support this year as it has made our scholarships and education awards and programs possible. Please continue your support when you are contacted in July.

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