COMPOSITES

WINTER 2023

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Official Newsletter of the SPE Composites Division

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SPE Foundation

By: Eve Vitale

The SPE Foundation and its partners utilize Positive Plastics Education in three areas of influence and impact. For Emerging Workforce, it awards scholarships and grants. To Create Opportunities for Historically Under-represented Populations in the plastics industry, including students of color, women, and students of lower socio-economic backgrounds, the Foundation collaborates with community partners to deliver multi-touch STEM education, engage students in after-school SPE STEM clubs, and partners with the Girl Scouts to engage girls in polymer science STEM activities. The PlastiVan® and PlastiVideo® programs engage students in the discussions and science-based evidence surrounding the Sustainability of Plastics and exposes students to the many career pathways available to them in the plastics industry.

Fueled by the generosity of our donors, we're celebrating our success in 2022:

- o $191,000 in scholarships
- o 4 after-school SPE STEM Clubs
- o 16,000 students served by PlastiVan®
- o 12 SPE Junior Researchers
- o And more!

continued on page 4...

SPE Foundation continued...

Giving Tuesday is a National Day of Philanthropy celebrated on the first Tuesday after Thanksgiving. This year the SPE Foundation raised funds to support its Girl Scout Color Your World with Polymer Science patch and the next patch in the series – Sustainability in Packaging. With a designated gift from the Automotive Division of $10,000 the SPE Foundation was able to leverage that donation as a matching fund to motivate other donors. The goal was to raise $25,000, and with the Division's help over $31,000 was raised. Besides many individual donors, the SPE Chicago Section and Chicago SPE Educational Foundation also donated $5,000 for the cause.

The Color Your World with Polymer Science patch is currently available to 19,000 girls in the Girl Scouts of Northeast Texas Council and is supported by the PlastiVideo® entitled ROYGBIV which was funded by the SPE Color and Appearance and the Additives and Color Europe Divisions. One of the program pillars of the Girl Scouts is STEM (Science, Technology, Engineering, & Mathematics). The data shows that Girl Scouts aspire to leadership in STEM careers at a higher rate than girls who are not Girl Scouts. We want to educate these girls and young women about the opportunities they have in the plastics industry.

Plans for the 2023 Girl Scout collaborations involve marketing the current patch to at least five (5) more councils in targeted geographies throughout the United States. The second SPE patch curriculum will be developed using the Girl Scout Leadership Experience processes and the PlastiVan® curriculum to:

- o Demonstrate the benefits of plastic packaging in everyday life
- o Discuss current and upcoming innovations in packaging which make it more sustainable
- o Excite girls about packaging careers in the plastics industry
- o Point girls to colleges and universities that support degrees in packaging, and
- o Encourage girls to recycle at home and to become advocates for recycling in their communities

Many SPE Chapters sponsor our flagship PlastiVan® program, allowing hundreds of students to experience lively demonstrations and hands-on activities, designed to excite them about the opportunities in science and engineering in the plastics industry. Students learn about the chemistry, history, processing, manufacturing, and sustainability of plastics and how science and real-world plastics applications relate to their everyday lives.

Positive Plastics Education is a crucial step in changing the "plastics" narrative to reflect the science and innovative culture of our industry. The SPE Foundation relies on our partners to get the job done. If you or your company would like to support our efforts, please contact me at foundation@4spe.org. Together we are making a difference!

Respectfully submitted,
Eve Vitale, SPE Foundation

This Issue:

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Award Opportunities

By: Dr. Pritesh Yeole

Recognizing excellence in the development and dissemination of composite materials is one of the goals of the Society of Plastics Engineers' Composites Division. To commemorate and recognize these people on both an academic and professional level, a number of prizes have been established. These prizes are given out annually by the Composites Division following challenging competitions involving the solicitation of nominees and applications. The awards are a) Harold Giles Award, b) Jackie Rehkpof Scholarship, c) Travel Award, and d) Educator of the Year Award. As of January 1st, nominations are accepted for non-financial awards: the Honored Service Member/SPE Fellow and the Composite Division Person of the Year Award. The two awards are intended to honor outstanding achievements from committed society members.

Harold Giles Scholarships

This award was established in memory of the late Harold Giles, who left this world far too soon. During his time at Azdel and UNC, Harold was one of the best Composite Division Awards Chairs that many of us had the pleasure of working with. He would have been overjoyed to learn that we are using his name to recognize deserving students. SPE International distributes this prize as part of their Foundation Program series. From the pool of applications in the graduate and undergraduate student categories, the Composites Division will choose the winners. The winners receive the award through SPE International.

The scoring criteria is based on twenty points for the category of academic accomplishments, volunteer work, and other honors; up to ten points for the quality of the recommendation letters; ten points for prior employment history, especially if this involved composite activity; up to five points for correctly completing the application form and using good English; five points for providing their transcript and for getting good grades.

Award Requirements

- Two awards presented to one undergraduate and one graduate student, who will maintain the academic status for at least two semesters after award announcement.
- An essay documenting experience in the composites industry is required (courses taken, research conducted, or jobs held)
- Have not received the award in previous years.
- Winners are typically students who not only maintained a good grade point average but also served their community, had some experience in the composite area, and are backed by solid reference letters from former professors and employers

The award can be up to $3500 per student depending on funding availability.

Key Dates

Issue call for nominations: February 1
Close call for nominations: April 31
Complete award adjudication: June 30
Notify recipients: July 30
Present awards: SPE ACCE

continued on page 7...

This Issue:

Award Opportunities continued...

Dr. Jackie Rehkopf Memorial Scholarships

This honor is given in memory of the late Jackie Rehkopf, an accomplished engineer who wrote books and worked hard in the composites industry. These prizes are sponsored jointly by the Automotive and Composites Divisions, who also coordinate their efforts. This prize for outstanding performance is given out each year during the SPE ACCE conference in the fall.

Award Requirements

- A single full time grad student or two undergrad students if no grad students qualify
- Preference will be given to female students, but the best candidates will be selected
- Focus should be on research activities targeted to ground transportation composite technology
- Students must be in good academic standing and pursuing a degree in Polymer Science, Composites, Plastics, or a related Engineering discipline
- A 2-page essay is required showing planned work and how it will benefit composites in an automotive or other ground transportation application
- A letter of recommendation from the student's advisor or mentor is also required
- Scholarship recipients are required to present work at an SPE technical conference and/or have it published in an SPE technical journal

The award can be up to $5000 if one student is selected or up to $2500 per student if two are selected, depending on funding availability.

Key Dates

Issue call for nominations: January 1
Close call for nominations: April 31
Complete award adjudication: June 30
Notify recipients: July 30
Present awards: SPE ACCE

continued on page 8...

Award Opportunities continued...

Travel Award:

The recipient of this two-year award must submit an abstract the first year and return the second year to give a paper or poster outlining how the subject has developed. At ANTEC, this prize is given out during the business meeting. Traditionally, grading has been determined by three factors: English, novelty of the idea, and research plan strength. This $2000 reward will be paid out over the course of two years in two installments. Each year, industry partners support this prize. Please contact Dr. Pritesh Yeole (priteshyeole.mse@gmail.com), the Awards Chair, if your organization would like to sponsor this award.

Award Requirements

- A two-part award presented annually to an undergraduate or graduate student.
- At the time of application, master's students must be in the first year of their program and doctoral students must be in the first two years of their program
- The winner is selected based on a 250-word abstract describing their composites research
- In the first year, the recipient receives a $1000 (USD) scholarship award and a plaque, presented at ANTEC
- To be eligible for the second $1000 installment, the research described in the winning abstract must be presented in a paper at ANTEC the following year

Key Dates

Issue call for nominations: January 1
Close call for nominations: February 28
Complete award adjudication: March 14
Notify recipients: March 31
Present awards: ANTEC

Educator of the Year Award:

The Educator of the Year Awards are sponsored by an industry. At ANTEC, a plaque and certificate will be presented during the business meeting. The current score sheet allows for a maximum of ten points to be awarded for English at a 1X level, ten points for recommendation letters at a 2X level, and for student support examples at a 3X level. This esteemed award is intended to celebrate an educator who has inspired his students to succeed in the composites industry and further their careers in the sector.

Award Requirements

- Someone in the educational field (high school, university, or college-level)
- Has made a significant contribution to the training of students in the composites area. E.G.:
    - o the creation of new educational programs
    - o the development of new pedagogical tools
    - o motivating students to enter the composites sector
- Selection will be based on contributions made during the previous year.
- Must submit a nomination form and two letters of support

The award is $2500, covered by an industry sponsor. If any company like to sponsor this award, please reach out to the Awards Chair Dr. Pritesh Yeole (priteshyeole.mse@gmail.com).

Key Dates

Issue call for nominations: January 1
Close call for nominations: February 28
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Present awards: ANTEC

This Issue:


Westlake
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Michael Connolly

SPE Composites BOD Congratulates Michael Connolly on his retirement

Retirement is not the end of the road. It is the beginning of the open highway.

After 26 years' service at Huntsman Polyurethanes and over 38 years in materials & process development, Michael retired at the end of March 2022. Michael happily stated "with good planning and some luck, I've determined that my future finances are where they need to be. So, I'm retiring a bit early in order to enjoy the freedom while still being young and healthy enough to do so."

Michael's career in material development included stints in basic research on polymer blends and ionomeric materials along with applied R&D in polymer composites, thermoplastic polyurethanes and engineering thermoplastics as well as acoustic, energy absorbing, and structural foams. He authored or co-authored 14 technical papers on polyurethane composites at international conferences since 2005 and holds 2 U.S. patents. Over the past 20 years, Michael was Technology Leader for Composites at Huntsman. He and his team innovated the first commercially viable PU pultrusion technology in 2005 enabling production of higher performing, lighter weight pultrusion profiles at higher productivity vs. incumbent materials for use in industrial applications such as ladder rails, sheet & tube piles and window lineals. Over the past 7 years, Michael's focus turned to the automotive market to bring new technology to structural and semi-structural sandwich composites and high performance resin transfer molding.

He served as Chair of both the Composites and Automotive Divisions of SPE and, in 2013, was awarded Composites Person of the Year by the Composites Division along with Honored Service Member status by SPE. Significantly for the Composites Division, Michael was one of the founding team members in 2001 for the very successful Automotive Composites Conference and Exhibition (ACCE) which is jointly sponsored by the SPE Composites & Automotive Divisions. Michael served initially as Sponsorship Chair helping to ensure the event was still financially successful even in the immediate aftermath of the 9/11 attacks. Subsequently, he served twice as event Chair and numerous times as Technical Program Chair or Co-Chair.

Michael says "I intend to keep myself involved in the industry by participating on the SPE Composites Division Board, attending some industry events here and there such as ACCE or IACMI and doing some consulting as opportunities arise that sufficiently intrigue me". As such, Michael has set up MC Material Design to support clients interested in taking advantage of his expertise.

Otherwise, Michael intends to focus on his family, his growing role as "PopPop" and pursuing his passions for travel, food, beer and biking.

This Issue:

ACCE Reserve the Dates

FOR IMMEDIATE RELEASE: 28 OCTOBER 2022
Media Contact: Teri Chouinard, SPE Auto. Div. Comm. Chair, 248.701.8003, teri@intuitgroup.com

SPE Automotive Composites Conference & Expo (ACCE) 2022 Surpasses 2021 Event In Attendance, Presentations, Sponsorships, Exhibits & Keynotes

New Category – "Composites in Electric Vehicles" Enhanced the Event

74 Technical Presentations, 45 Student Posters, 61 Sponsorships, 40 Exhibits, 5 Keynotes

TROY (DETROIT), MICH. -

The 22nd annual SPE® Automotive Composites Conference & Expo (ACCE), produced by SPE's Automotive and Composites Divisions, surpassed the ACCE 2021 event with increased attendance, technical presentations, student posters, sponsorships, exhibits and keynotes. "Our ACCE theme 'Composites the Key to EV' was effective in attracting 15 technical presentations and 5 keynotes demonstrating how polymer composite technologies provide solutions for BEVs (Battery Electric Vehicles)," said Dr. Leonardo Simon - ACCE Co-Chair and professor, Chemical Engineering at University of Waterloo. "Numerous ACCE exhibits featured advanced materials, machinery, tooling, testing, software and other technologies necessary to support the automotive industry transition to sustainable mobility," said Dr. Christoph Kuhn - ACCE Co-Chair and project manager, HV Battery at Volkswagen Group of America. "ACCE is where composites industry and academia leaders network, learn and build relationships to advance the automotive industry and the move toward BEVs is benefiting increased partnerships and growth," said Dr. David Jack – ACCE Technical Program Co-Chair and professor, Mechanical Engineering at Baylor University.

continued on page 12...

This Issue:

ACCE Reserve the Dates continued...

Welcome Remarks

The ACCE 2022 event "Composites The Key to EV" was held September 7 – 9, 2022 at the Suburban Collection Showplace Diamond Banquet and Conference Center in Novi, Michigan. The SPE ACCE is known as "The World's Leading Automotive Composites Forum." ACCE's goal is to educate the global transportation industry about the benefits of polymer composites in vehicle design and manufacturing for reducing mass, improving performance, lightweighting, and more.

The ACCE 2022 event attracted over 500 registered attendees including automotive OEMs, tier suppliers, academic faculty and students, and other industry professionals. The technical program included 74 presentations on the latest automotive composites advancements organized into the following 10 categories: Composites in Electric Vehicles; Advances in Thermoplastic Composites; Advances In Thermoset Composites; Enabling Technologies; Additive Manufacturing And 3D Printing; Carbon Composites And Reinforcements; Modeling Of Composites; Sustainable Composites; Bonding, Joining And Finishing; and Business Trends And Technology Solutions.

Three presenters were recognized in the program guide and honored at the event as a "Finalist for Best Paper Award". Five keynotes and a panel discussion about Composites in Electric Vehicles were highlights of the event. The Student Poster Competition included 45 posters illustrating composites research projects from 12 universities from the United States and Canada. Eighteen students received awards for having the best posters in a variety of categories. Scholarships were awarded to five students who demonstrated scholastic excellence in composites engineering and related studies and promise for the future. The annual ACCE Part Competition included five nominations for material innovations in prototype and production parts. Awards were presented for most innovative parts, selected by industry experts, and a "People's Choice" award was also presented. The total number of sponsorships reached 61 including 40 exhibitors displaying the latest composites technologies and additional companies sponsoring coffee breaks, lunches, receptions and advertising. Ten leading industry publications supported the event with advertising worldwide.

The 2022 ACCE was led by returning ACCE 2021 Co-Chair Dr. Leonardo Simon, professor, Chemical Engineering at University of Waterloo and new ACCE Co-Chair Dr. Christoph Kuhn, program manager, HV Battery at Volkswagen Group of America. The technical program was co-chaired by Dr. David Jack, professor, Mechanical Engineering at Baylor University; and Dr. Oleksandr G. Kravchenko, assistant professor, Composites Modeling and Manufacturing Group, Department of Mechanical and Aerospace Engineering at Old Dominion University; and Dr. John W. (Jack) Gillespie Jr., director, Center for Composite Materials (CCM) at University of Delaware.

continued on page 13...

This Issue:

ACCE Reserve the Dates continued...

Presentations:

All five keynote presentations, a panel discussion, and many of the technical paper presentations reflected the conference theme "Composites: The Key to EV" emphasizing the continued importance of composites in the advancement of the automobile.

Keynotes:

The first keynote of the conference, "Advanced Polymer Composites for Next Generation Electric and Autonomous Vehicles (EV/AV) - Challenges and Opportunities," was delivered by Dr. Felix H. Wu, senior technology manager, Vehicle Technologies Office (VTO), Office of Energy Efficiency and Renewable Energy (EERE) at the U.S. Department of Energy (DOE). His presentation outlined the science and innovation developed from the ongoing VTO's Composites Core Program. New research on multi-functional materials utilizing advanced polymer composites to reduce manufacturing cost and carbon footprint, overall embodied energy of the vehicle as well as weight saving of electric vehicles was also presented. "Multi-functional materials will allow design of automotive components capable of undertaking multiple functions, increasing battery specific energy capacity, reducing the number of vehicle components and thus overall weight and total cost," said Wu. "Such composite materials and structures systems with autonomous health management could transform the current EV/AV platform," added Wu.

The second keynote of the conference, "Material Innovations in EV Battery Enclosures including UL Solutions' Battery Enclosure Material Screening (BEMS) ," was presented by Daniel O'Shea, principal engineer, UL Solutions. His presentation included a background on electric vehicle (EV) battery packs, a description and examples of thermal runaway events, and available methods for the evaluation of plastic and composites materials for battery applications, including the Battery Enclosure Thermal Runaway (BETR) evaluation.

The third keynote, "Setting Up Local HV Competencies," was presented by Wolfgang Maluche, vice president engineering, Engineering & Planning Center (EPC), Volkswagen Group of America. His presentation outlined how Volkswagen is testing and incorporating HV batteries into their vehicles and featured a video on the new VW ID. Buzz and ID. Buzz Cargo based on the Volkswagen Group's Modular Electric Drive matrix (MEB).

The fourth keynote, "Opportunities for Composite Material in Future Multi-material Battery Enclosures," was presented by Warden Schijve, design leader, AZL Aachen GmbH. Warden led a one-year consortium project at AZL Aachen with 46 participating companies on multi-material battery casing designs. It yielded 20 different concept designs that were CAE analyzed to all relevant load cases and compared on cost and weight with a state-of the-art metal (welded aluminum) design. The keynote presentation highlighted the project results including analysis and comparisons of both thermoset and thermoplastic materials, solid laminate and sandwich solutions, short fiber overmolded solutions, various SMC options, steel, aluminum, and combinations of all these materials.

"The final keynote, "The Journey to a Composite Battery Enclosure," was delivered by Fred Chang, leader, Automotive Electrification and Structures at Sabic. The presentation featured how advanced polymer composites and technologies are helping the industry to meet critical goals and requirements for EV batteries including reducing weight and cost and enhancing fire protection and crashworthiness.

continued on page 14...

This Issue:

ACCE Reserve the Dates continued...

Panel Discussion:

The ACCE 2022 event also included a panel discussion, "Plastics and Composites in Electric Vehicles," moderated by ACCE Co-Chair Dr. Leonardo Simon, professor, Chemical Engineering at University of Waterloo . The panelists included: ACCE Co-Chair Dr. Christoph Kuhn, program manager, HV Battery at Volkswagen Group of America; Dr. Deborah Mielewski, technical fellow, Sustainability at Ford Motor Company; Brent Collyer, director, R & D Light Weighting at Rassini International; Dr. Warden Schijve, design leader, AZL Aachen GmbH; and Dr. Venkat Aitharaju, staff researcher at General Motors Company, and principal investigator, Department of Energy Project (DOE) developing multi-functional advanced composite materials and applications for structural battery enclosures. The panel of industry experts discussed the importance and value of polymer composites in advancing EV automotive mobility, future challenges, and the need for more innovation including solutions for expanding range, infrastructure and energy solutions.

Best Paper Awards:

Excellence in technical writing is recognized annually at ACCE by honoring those who have presented the best papers at the conference. The 2022 Best Paper Award winners received the highest average ratings by conference peer reviewers including members of the ACCE planning committee and other industry experts. The ACCE 2022 Best Paper Award Winner was Garam Kim, from Purdue University for his paper, "Application of Thermoset Polymer Coating to Additively Manufactured Carbon Fiber Composite Tooling." Best Paper Finalist Awards were presented to Mohammad Nasmus Saquib, from Old Dominion University for his paper, "Reconstruction of FullFiber

continued on page 15...

ACCE Reserve the Dates continued...

Student Poster Competition Winner Jason Pierce

Orientation Distribution in Molded Composites," and to Sagar Doshi, from the University of Delaware – Center for Composite Materials for his paper "Effect of Environmental Factors on the Properties of Resin, Interface and Composites in Automotives." All of the winners (first place and finalists) this year were students and all were presented with plaques and certificates at the event.

Student Poster Competition:

Students from the U.S.A. and international universities feature innovative research related to polymer composite materials and manufacturing technologies for automotive applications via the annual ACCE Poster Competition. This yearly event enables students to meet with people in the industry and learn about career opportunities as a scientist, engineer, researcher and other professions in the field. Automotive OEMs, tier suppliers, and others appreciate the introduction to the next generation of automotive composites engineering professionals and opportunity to potentially hire them in the future. The 2022 ACCE Student Poster Competition included 45 posters from 12 different universities in the United States and Canada. The 2022 ACCE Student Poster Competition winners are:

Undergraduate Category

1st Place: "Poly(Butylene Succinate-co-Butylene Adipate) based Biodegradable Composites for Sustainable Automotive Packaging"
Kaitlyn Root, University of Guelph

2nd Place: "Sustainable and Lightweight Compatibilized Biocomposites from Ocean Recycled Nylon and Lignin Biocarbon for High Performance Automotive Applications"
Victoria Muir, University of Guelph

3rd Place: "Cork Waste in Sustainable Composites Uses: Performance Comparison Between Biodegradable Composites and Polypropylene-Based Composites"
Kiara Mohr, University of Guelph

3rd Place Co-Winner: "Effect of Carbonization Temperature on Tensile Strength and Electrical Resistivity of Lignin-Based Carbon Fibers"
Charlton Hill, Clemson University

Masters Category

1st Place: "Recycled Carded Carbon Fibers for Automotive Applications"
Vinit Chaudhary, University of Tennessee

2nd Place: "Design Validation of a Structural Component of an Ultra-Lightweight Carbon Fiber Reinforced Thermoplastics Composites Automotive Door "
Akash Ravindra Kolhe, Clemson University

3rd Place: "Mechanical Behavior of Impacted Nylon/Carbon-Fiber Additively Manufactured Components Prepared via Fused Filament Fabrication"
Jackson Wilkins, Baylor University

continued on page 16...

This Issue:

ACCE Reserve the Dates continued...

PhD – Nondestructive Evaluation & Characterization Category

1st Place: "Characterization of Void and Fiber Distribution Within the Bead Microstructure for Large Area Additive Manufacturing Polymer Composite deposition Using Micro-CT"
Sayah Neshat, Baylor University

2nd Place: "Quantitative Inspection of Internal Raster Orientation of Additively Manufactured Components via Ultrasonic Nondestructive Testing"
Atik Amin, Baylor University

3rd Place: "Investigating Impact from UT Uncertainty in Quantifying Ply Orientation on the Probabilistic Failure Envelope"
Rahul Kirtunia, Baylor University

PhD –Bio, Additive, Manufacturing Category

1st Place: "Bamboo Trailer Decking Development for Sustainable Transportation"
Sanjita Wasti, University of Tennessee

2nd Place: "Predicting Z-Strength in Polymer Additive Manufacturing"
Sarachandra Kundurthi, Michigan State University

3rd Place: "Metal 3D Printing Through Thixotropic Processing"
Sriram Jaishanka, Georgia Tech

3rd Place Co-Winner: "Automated Tape Placement"
George Chahine, University of Tennessee

continued on page 17...

ACCE Reserve the Dates continued...

PhD – Design, Modeling & Simulation Category

1st Place: "Short Carbon Fiber Orientation Evolution Analysis for Polymer Melt Additive Manufacturing via Coupled CFD-DEM Simulation"
Jason Pierce, Baylor University

2nd Place: " Effective Elastic Properties Calculation on Pristine and Wrinkled Composite Laminates with Ply Orientation Variation"
Victor Mota, Baylor University

3rd Place: "Modeling Fiber Dispersion and Attrition During the Extrusion Process for Single Screw Extruders"
Hector Perez, University of Wisconsin

3rd Place Co-Winner: "Predicting Material Properties of Reprocessed LFT's via Machine Learning: Optimizing Recycling of Composite Materials"
Allen Jonathan Roman, University of Wisconsin-Madison

Scholarship Awards:

The ACCE organizing committee honored the winners of the the three SPE ACCE Scholarships and two Dr. Jackie Rehkopf Scholarships at this year's event. The ACCE Scholarships are sponsored by the SPE Automotive and SPE Composites Divisions. The Dr. Jackie Rehkopf Scholarships are sponsored by the SPE Automotive and Composites Divisions and the generous donations of friends and family to honor the memory of the late long-time SPE ACCE committee member, SPE

Automotive Div. board member, and automotive composites researcher. All scholarships are awarded to promising students pursuing advanced studies in a composites related field and administered as part of the SPE Foundation.

The three winners of the 2022 SPE ACCE Scholarships ($2,000 USD each) were Cecile Grubb, a graduate student pursuing a PhD in Materials Science and Engineering at the University of Tennessee Knoxville, Nityanshu Kumar, a Polymer Physicist at The University of Akron, and Alireza Zarei, a PhD candidate pursuing a doctoral degree in Automotive Engineering at Clemson University.

The two winners of the 2022 Dr. Jackie Rehkopf Scholarships ($2,500 USD each) are Sanjita Wasti, a PhD candidate pursuing a doctoral degree in Mechanical Engineering at the University of Tennessee Knoxville, and Madhura Limaye, a PhD candidate pursuing a doctoral degree in Mechanical Engineering at Clemson University.

The SPE ACCE Scholarship committee was led by Dr. Alper Kiziltas, Amazon Advanced Materials, and included Dr. Leonardo Simon, University of Waterloo; Dr. Christoph Kuhn, Volkswagen Group;Dr. Oleksandr G. Kravchenko, Old Dominion University; Dr. John W. Gillespie, Jr., University of Delaware; Dr. Akshay Trivedi, General Motors Co.; Dr. David Jack, Baylor University; Keith Siopes, Sumika Polymers North America; and Zeynep Iyigündoğdu, Adana Alparslan Turkes Science and Technology University.

continued on page 18...

This Issue:

ACCE Reserve the Dates continued...

Part Competition:

This year's ACCE Part Competition included 5 nominations. A panel of automotive composites industry experts, from industry and academia, studied the nominations in advance of the event and reviewed the parts onsite and voted for the most innovative material and process applications in 2 categories (Most Innovative Production Part and Most Innovative Prototype Part). Nominations were judged on the impact and trend-setting nature of the application, including materials of construction, processing methods, assembly methods, and other enabling technologies that made the application possible. Nominations emphasized the benefits of design, weight and cost reduction, functional integration, and improved performance. A separate prize, the People's Choice award, was selected by vote of conference attendees. Here are the winners:

Toyota and BASF Winners for Most Innovative Material

Most Innovative Material in the Production Part Category:

Polyurethane Pultrusion Overmolded Seat Back and Seat Cushion Frame on the 2022 Toyota Tundra

Nominated by: BASF

Most Innovative Material in the a Prototype Part Category:

Carbon Fiber Composite Timing Cover

Nominated by: University of Toronto and Ford Motor Company of Toronto

Most Innovative Process in the Prototype Part Category:

Lightweight Composite Axel Spacers

Nominated by: University of Toronto and Ford Motor Company of Toronto

People's Choice Award:

Multi-Material EV Battery Enclosure Prototype

Nominated by: Teijin Automotive Technologies

Honorable Mention Material in the Prototype Category:

Lightweight Composite Axle Spacers

Nominated by: Rassini International

PlastiVan®:

Once again, ACCE hosted the PlastiVan® program – this year including 40 students from Ecotek Lab, in Detroit, Mich. The PlastiVan program provides sound science and educational programs, including fun experiments with plastics, which spark scientific curiosity

continued on page 19...

ACCE Reserve the Dates continued...

in students while increasing their knowledge of the contribution plastics make to modern life and encouraging them to seek careers in engineering. The Ecotek program is focused on providing academically gifted students in middle school and high school with opportunities to participate in international science research projects. The projects are very challenging and prepare the students for college-level opportunities. After the PlastiVan class onsite at ACCE, the students toured the ACCE exhibits and student posters and enjoyed learning more about automotive composites.

ACCE Sponsors:

The 2022 SPE Automotive Composites Conference & Expo (ACCE) was made possible by the support of Sponsors including:

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Since 2001, The Automotive and Composites Divisions of the Society of Plastics Engineers (SPE®) have jointly produced the ACCE to educate the industry about the benefits of composites in automotive, light and heavy-duty truck, off-highway vehicles, and other ground transportation applications. The next ACCE is scheduled for Sept. 6 – 8, 2023 at the same venue as the 2022 event - the Suburban Collection Showplace Diamond Banquet and Conference Center in Novi, Michigan. An "Early Bird Discount" is available to sponsors who commit to supporting the ACCE 2023 event in 2022 and process payment by January 31, 2023. For more info contact teri@intuitgroup.com

For more information on the SPE ACCE see https://speautomotive.com/acce-conference/
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This Issue:

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This Issue:

ANTEC® 2023

Denver, CO · March 27-30, 2023

ANTEC® 2023 will showcase the latest advances in industrial, national laboratory, and academic work. Learn about new findings and innovations in polymer research, products, and technologies. There will be multiple opportunities to spend time with colleagues at SPE-hosted meetings, receptions, networking luncheons, and SPE Chapter networking events.

Additional Conference Highlights:

- Pre-ANTEC Workshops
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- Welcome Reception
- Networking Receptions
- Honors & Awards Luncheon

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Presented by SPE Thermoset Division

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SPONSORSHIP:

- Educates the Industry about the benefits of thermoset composites in numerous applications - The 2022 SPE Thermoset TopCon included 160 registered attendees, 27 sponsors, 2 Keynotes, 20 technical presentations and great networking during 2 breakfasts, 2 lunches and a fun cocktail reception!
- Enables Awards for Research in the field by promising students – The First SPE Thermoset Div. Poster Competition was launched at the 2022 event.
- Provides Educational Grants to Universities to Expand Thermoset Technology Education – A Grant in Honor of Hugh Karraker, Great Grandson of Leo Baekeland, the "Father of Modern Plastic" was awarded to the University of Wisconsin- Madison Polymer Education Center.

- Provides the SPE - Thermoset Division valuable resources required to ensure our continued success.

PAPERS:

Thermoset plastics are the most durable, versatile and attractive materials for automotive; air and ground transportation; off-highway equipment; medical; appliance; oil and gas; and a wide variety of other applications where structural integrity, lightweighting, and heat and corrosion resistance are important. Join industry leaders and present your company's latest advancements in thermoset technologies. Technical paper presentations on innovative thermoset plastic materials, processing, manufacturing, testing, sourcing, component design, sustainability and other solutions are encouraged.

Abstracts are due JANUARY 20, 2023 and final presentations are due MARCH 1, 2023. Limited timeslots are available. **Email abstracts to teri@intuitgroup.com.**

The **SPE Thermoset TopCon 2023** will also feature keynotes and exhibits highlighting advances in materials, processes, and equipment for thermoset technologies in multiple applications. The 2-day conference includes networking breakfasts, lunches and a cocktail reception for enhanced collaboration. Optional social events, including a tour of the Polymer Engineering Center at UW – Madison, golf outing at University Ridge Golf Course and a cruise of the Madison shoreline via private yacht with deluxe appetizers and beverages are offered on May 8, the day before the conference begins.

SPONSORSHIP OPPORTUNITIES

A variety of sponsorships are available including passes to the conference, exhibit opportunities, and great corporate exposure.

All sponsorships include 10 ft. wide exhibit spaces with a skirted table and chairs, company logo on signage at the event and in conference advertising and company name in publicity.

Breakfast, Lunch and Reception Sponsorships include additional corporate specialty signage, more prominent promotion, and premier exhibit placement at the event.

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IAG Winners Announced

SPE® Automotive Names Winners for 51st Annual Automotive Innovation Awards Competition

FOR IMMEDIATE RELEASE:
2 NOVEMBER 2022
Media Contact: Teri Chouinard CBC, APR,
SPE Automotive Div. Comm. Chair
248.701.8003. teri@intuitgroup.com

TROY, (DETROIT) MICH.

The Automotive Division of the Society of Plastics Engineers (SPE®) today announced the winners for its 51st annual Automotive Innovation Awards Gala, the oldest and largest recognition event (established in 1970) in the automotive and plastics industries. The announcement was made November 2, 2022 during the 51st SPE Automotive Innovation Awards Gala held at the Burton Manor in Livonia, Mich., USA. The Chassis/Hardware category winner was also this year's Grand Award winner. The Grand Award winner is selected from the winners of each of the 10 categories by a panel of Blue Ribbon Judges who are industry experts. This year's winners are: .

GRAND AWARD & CATEGORY WINNER: Chassis/Hardware Tension Leaf Spring

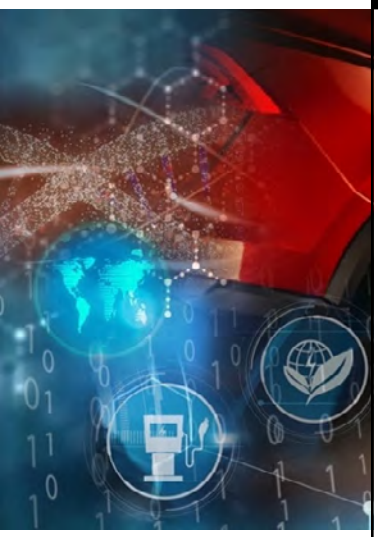
- OEM Make & Model: 2022 General Motors Co. Chevrolet Silverado & GMC Sierra
- Tier Supplier/Processor: Mubea (Muhr und Bender KG)
- Material Supplier/Toolmaker: Multiple / Mubea (Muhr und Bender KG)
- Material /Process: Epoxy / Prepreg Layup and Compression Molding

The first all-composite leaf spring for light truck programs reduces mass up to 75% vs. all-steel and 58% vs. hybrid steel/composite solutions while doubling durability, eliminating corrosion, improving ride comfort, lowering NVH, and increasing payload. Fiberglass-reinforced epoxy prepreg is used to form a single leaf with a progressive spring rate that eliminates the shackle, shackle bushing, and helper leaves yet passes all OEM test requirements.

continued on page 25...

This Issue:

IAG Winners Announced continued...



CATEGORY WINNER:
Additive Manufacturing
Spoiler Closeout Seal

- OEM Make & Model: 2022 General Motors Co. Chevrolet Tahoe, Chevrolet Suburban, Cadillac Escalade, GMC Yukon
- Tier Supplier/Processor: HP Inc. & AMT Ltd. / GKN Additive (Forecast 3D)
- Material Supplier/Toolmaker: BASF Corp. /GKN Additive (Forecast 3D)
- Material /Process: BASF SE Ultrasint TPU01 TPU / HP Multi Jet Fusion 5200 Series

The powder-bed fusion process was used to source, print, process, and install 60,000 TPU spoiler closeout seals to meet 10 weeks of production as a bridge solution while hard tooling was being produced. Innovative vapor polishing and drying processes cleared a bottleneck, halved production time, were used to finish parts, eliminating the need for post-print dyeing. The seals close out gaps on left and right sides of rear spoiler, improving finish and fuel efficiency.

CATEGORY WINNER:
Aftermarket & Limited Edition/ Specialty Vehicles
Carbon Fiber C-Brace

- OEM Make & Model: 2022 Ford Motor Co. Ford Bronco Raptor
- Tier Supplier/Processor: Montaplast of North America
- Material Supplier/Toolmaker: BASF Corp. / Commercial Tool Group
- Material /Process: Ultramid B3WC4 HP CF & GR PA6 / Injection Molding

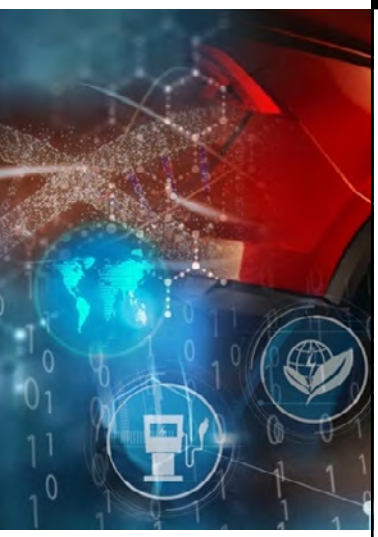
This customer-visible, Class A C-brace was designed to meet offroad desert durability requirements for convertible versions of the vehicle while boosting torsional stiffness 40% to improve handling and NVH. Weight was reduced 55% vs. aluminum and 85% vs. steel by adopting a sandwich composite approach. Upper and lower shells were injection molded in 35% GR PA6 while a core was injection molded in 20% CF-PA6, then components were bonded with a newly formulated methacrylate adhesive.

CATEGORY WINNER:
Body Exterior
Panoramic Sunroof Frame

- OEM Make & Model: 2022 Hyundai Motor Group Kia Sorento
- Tier Supplier: Inalfa Roof Systems Korea
- Material Supplier: GS Caltex Corp.
- Material /Process: Hiprene ALG14BF PA6 / Injection Molding

continued on page 26...

IAG Winners Announced continued...



Several novel technologies contributed to this large injection molded LFT-PA6 panoramic sunroof frame. First, flat rather than round glass fibers provided higher dimensional stability and reduced warpage. Second, the twist pultrusion was used to produce LFT pellets whose fiber length exceeds the length of the pellets, again contributing to mechanical improvements. Weight was reduced 51% and part count dropped from 33 to 4 vs. a steel frame. Versus carbon fiber-reinforced LFT, torsional rigidity was 13% higher and breaking force 25% better at 24% lower cost.

CATEGORY WINNER:
Body Interior
2nd Row Seat Backs & Cushions

- OEM Make & Model: 2022 Toyota Motor Corp. Toyota Tundra
- Tier Supplier/Processor: Flex-N-Gate Corp. & Adient / Flex-N-Gate Corp. & L&L Products
- Material Supplier/Toolmaker: BASF Corp. / SyBridge Technologies
- Material /Process: Ultramid B3ZG7 35% GR-PA6 & Elastocoat 74850 80% GR-PUR PA6 & PU / Pultrusion and Injection Overmolding

This composite seat structure combines a pultruded continuous fiberglass-reinforced PUR reinforcement beam that is injection overmolded with short-glass/PA6 to form the seat frame geometry. By replacing a 60-piece high-strength steel frame structure with a 4-piece molded composite structure, significant crash performance improvements were achieved while both cost and mass targets of 20% reduction were met. Additionally, over 100 welds at 16 weld stations were eliminated, significantly improving quality control, and under-seat storage that wasn't possible with the previous solution was added.

CATEGORY WINNER:
Electric & Autonomous Vehicle Systems
High Voltage Power Distribution System

- OEM Make & Model: 2022 Ford F-150 Lightning
- Tier Supplier/Processor: Aptiv PLC / Yazaki North America, Inc.
- Material Supplier: DuPont de Nemours, Inc.
- Material /Process: Crastin FR684 & HR5339 PBT / Injection Molding, Silicone Over Molding

This customizable, shielded high-voltage power distribution system permits 7 sets of subassemblies and up to 64 possible configurations from a single tool, providing both flexibility and scalability for future programs. Three different materials are used: a flame retardant 25% GR-PBT forms the internal assembly and terminal blocks and a silicone seal is overmolded directly onto a 30% GR-PBT cover. A unique shielding system uses stamped connection interfaces that reduce mass by 2/3s vs. cast products while maintaining electromagnetic shielding.

CATEGORY WINNER:
Materials
Thermoplastic BEV Thermal Management Solution

- OEM Make & Model: 2023 General Motors Co. Cadillac Lyriq
- Tier Supplier/Processor: Cooper Standard Automotive, Inc.
- Material Supplier/Toolmaker: DuPont de Nemours, Inc., Dow Chemical Co., LyondellBasell Industries / Cooper Standard Automotive, Inc.
- Material /Process: PA6/12, PA66 & PP / Extrusion, Molding, Forming, and Automated Assembly

continued on page 27...

This Issue:

IAG Winners continued...

Two developments provide a lightweight, thermoplastic solution for EV thermal management systems. PlastiCool 2000 multilayer tubing for glycol applications to 120°C provides excellent chemical resistance, 25% better permeation resistance and 60% lower weight than EPDM, and is available in smooth, convoluted, round, and non-round configurations. Ergo-Lock+ modular VDA connectors are flexible, offer visual and scannable latch verification, reduce insertion forces >30%, The system's modularity permits hundreds of connector configurations to be produced from a standard set of molded subcomponents at lower total cost.

CATEGORY WINNER:
Powertrain
High Pressure Oil Cooler Gasket Seal

- OEM Make & Model: 2022 General Motors Co. Chevrolet Silverado & GMC Sierra
- Tier Supplier/Processor: Uchiyama Marketing & Development America LLC
- Material Supplier/Toolmaker: Uchiyama Marketing & Development America LLC & DuPont de Nemours, Inc. / Uchiyama Marketing & Development America LLC
- Material /Process: UMC V7401 Ethylene Acrylic Elastomeric Plastic / Injection Molding

Oil cooler gaskets are small parts with important sealing functions between oil coolers and oil pumps in demanding engine environments. To eliminate leaks seen with fluorocarbon seals during temperature cycling, a new ethylene acrylic TPV was developed. It offers superior low-temperature sealing and maintains good compression set and controlled oil swelling from -40°-150°C and 14 bars oil pressure. Gasket height also was increased to provide higher contact pressure and better sealing. Costs were reduced 66% and sustainability was increased since the thermoplastic material is recyclable.

continued on page 28...

IAG Winners Announced continued...

CATEGORY WINNER:
Process/Assembly/Enabling Technologies
Direct Exposure Laser Welding

- OEM Make & Model: 2022 General Motors Co. Chevrolet Blazer
- Tier Supplier/Processor: Magna Lighting
- Material Supplier/Toolmaker: Various / SPM Automation
- Material /Process: Makrolon LED 2245 000000 PC / Injection Molding, Laser Welding

Hot-plate welding was replaced with a new process called direct epoxure laser welding to meet customer styling requirements for the light guides. Scanning lasers replace heated tools and can weld opaque lens borders without need for more costly laser-transparent materials. Additonally, clearance between internal components and weld ribs was reduced and ribs can be heated very precisely. The current design's complex geometries would not have been possible with traditional welding proecsses. Additionally, scrap was reduced 40-50% and energy usage by 85-95%.

CATEGORY WINNER:
Sustainability
Reclaimed TPO/Foam System

- OEM Make & Model: 2020 General Motors Co. Chevrolet Silverado & GMC Sierra
- Tier Supplier/Processor: Inteva Products, LLC
- Material Supplier: Inteva Products, LLC
- Material /Process: Inteather TGTPO ECO TPO / Extrusion and Repellitizing; Co-Extrusion of TPO Sheets; Vacuum Forming & Injection Graining; Press Lamination; and Assembly

Thanks to a patented recycling process, PIR bilaminate scrap comprised of TPO skins attached to cross-linked olefin foam is given new life in the same interior trim applications without sacrificing quality or performance. An additive package eliminates/binds/deactivates reactive residuals and trapped gases from foam. Just on this program, 680,389 kg of TPO resin is reclaimed annually, reducing landfilled scrap 93%, replacing 50% of prime TPO, and lowering CO2 emissions and energy usage 48% each.

continued on page 29...

This Issue:

IAG Winners Announced continued...

2022 SPE IAG Winners

Additive Manufacturing
Spoiler Closeout Seal

Aftermarket
Carbon Fiber C-Brace

Body Interior
2nd Row Seat Backs & Cushions

Body Exterior
Panoramic Sunroof Frame

Chassis/Hardware
Tension Leaf Spring

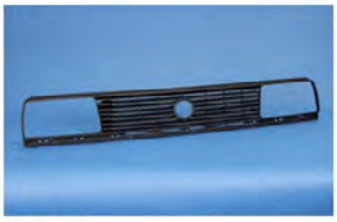
Electric & Autonomous Vehicles
High Voltage Power
Distribution System

Materials
Thermoplastic BEV Thermal
Management Solution

Powertrain
High Pressure Oil Cooler
Gasket Seal

Process/Assembly/Enabling
Direct Exposure Laser Welding

Sustainability
Reclaimed TPO/Foam System



Hall of Fame
First MIC Weatherable Grille

Hall of Fame 1987 Volkswagen Golf
with First MIC Weatherable Grille

VETA
2023 Cadillac LYRIQ

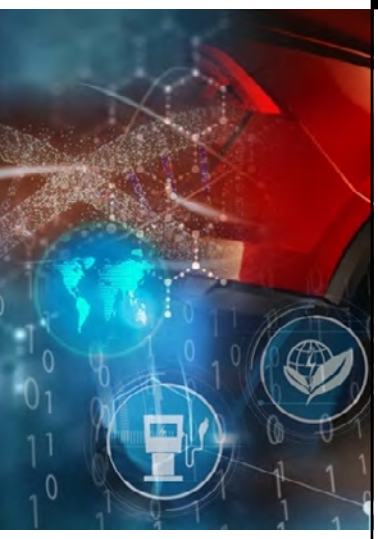
VETA
2023 Cadillac LYRIQ Interior

Lifetime Achievement
Probir Guha

continued on page 30...

This Issue:

IAG Winners Announced continued...



CATEGORY WINNER: VETA (VEHICLE ENGINEERING TEAM AWARD)

The all-electric 2023 Cadillac LYRIQ and a team from General Motors Co. (GM, Detroit) and its suppliers that developed the midsize sport utility vehicle (SUV) have been named the winners of this year's Vehicle Engineering Team Award (VETA). The VETA award was created by SPE in 2004 to recognize the technical achievements of entire teams — comprised of automotive designers and engineers, tier integrators, materials suppliers, toolmakers, and others — whose work in research, design, engineering, and manufacturing has led to significant integration of polymeric materials on notable vehicles. The vehicle features numerous plastic and composite innovations, many of which were nominated in other categories of SPE's Automotive Innovation Awards Competition, including the following:

- Aftermarket & Limited Edition/Specialty Vehicles Finalist: Electric Vehicle Supply Equipment (EVSE) Charging Accessory
- Aftermarket & Limited Edition/Specialty Vehicles Nomination: Ultium Battery Charger
- Body Exterior Finalist: Flow-Through Spoiler
- Body Exterior Nomination: Front Headlamp System
- Body Exterior Nomination: Rear Body-Side Taillamp System
- Body Exterior Finalist: Front Enclosed Illuminated Grille
- Body Interior Nomination: High-Gloss Piano Black Molded-in-Color (MIC)
- Electric & Autonomous Vehicle Systems Nomination: Connection Ring for EV Motors
- Electric & Autonomous Vehicle Systems Finalist: High-Damping AC Compressor Bracket
- Materials Finalist: Dual Cordset EV Charger Lens
- Materials Finalist: Thermal Management Tube & Connector Solution
- Materials Nomination: Center Frame Panel
- Process/Assembly/Enabling Technology Nomination: Elastic Averaging Vehicle Attachment
- Sustainability Nomination: Recycled Resin Blow Molded Ducts

CATEGORY WINNER: HALL OF FAME AWARD

The first Mold In Color (MIC) weatherable grille, used on the 1987 Volkswagen Golf, has been named the 2022 Hall of Fame Winner. The industry's first MIC weatherable grille, made possible with Luran S ® ASA from INEOS STYROLUTION (precolored plastic resins used in the plastic injection molding process so the molded part emerges in a specific color and finish), proved to be a game changer for vehicle front grilles by providing a weatherable, paint free exterior surface.

To be considered for a Hall of Fame Award, an automotive plastic or composite component must have been in continuous service in some form for at least 15 years and broadly adopted in the automotive industry. This application certainly qualifies as MIC grilles have become the industry standard used by every major OEM for front grilles replacing traditionally painted materials on over 300M exterior parts including grilles, mirrors, pillars, spoilers, fog bezels and more. Further technology now being developed around MIC ASA includes radar detection covers, lidar equipment, and CHMSL (Center High Mounted Stop Lamp) bezels. The automotive market for MIC ASA has now grown to over 100M pounds globally.

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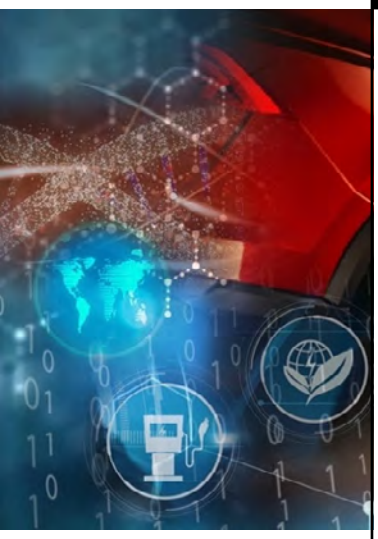
This Issue:

IAG Winners Announced continued...



The companies involved in developing the first MIC weatherable grille application include: OEM – Volkswagen Group; Molder/Processor – Volkswagen Group; and Material Supplier – INEOS STYROLUTION. Representatives from these companies accepted the SPE Automotive Hall of Fame Award, on behalf of the original team that worked to develop the technology.

CATEGORY WINNER: LIFETIME ACHIEVEMENT AWARD

Probir Guha, who retired in 2021 after an illustrious career in the automotive composites industry (mostly with the Budd Company, Continental Structural Plastics and Coats), has been named the 2022 Lifetime Achievement Award winner by the Automotive Division of the Society of Plastics Engineers (SPE®). Over his almost 50 year career, he led key innovations in the field reflected by his many global patents (179 patents issued & pending as of June 19, 2022); participated in industry technical conferences presenting several papers and holding committee leadership positions; was recognized with an industry award for innovation, research and advancements with the 2019 Pioneer Award by The American Composites Manufacturers Association (ACMA); and has edited a book where he coordinated the efforts of industry and academic experts to share concepts of how to further the composites industry.

Guha has recently formed a technology consulting company, Composites Innovations Inc., bringing the adoption of lightweight materials across multiple applications focusing on sustainability and recyclability, continuous hybrid fibers, smart composite technologies and artificial intelligence in products for continuous improvement.

SPE's Automotive Innovation Awards Program is the oldest and largest competition of its kind in the world. Dozens of teams made up of OEMs, tier suppliers, and polymer producers submit nominations describing their part, system, or complete vehicle and why it merits the claim as the Year's Most Innovative Use of Plastics. The annual event typically draws approximately 700 OEM engineers, automotive and plastics industry executives, and media. Funds raised from the event are used to support SPE educational programs including technical seminars and conferences, which help educate and secure the role of plastics in the advancement of the automobile.

This year's program was made possible with the support from the following sponsors: Celanese, SABIC, DuPont, DSM, The American Chemistry Council – Plastics Division, Ascend Performance Materials, BASF, Covestro, INEOS Styrolution, Inteva Products, LyondellBasell, Fast Radius and Van Norman Molding.

The mission of SPE is to promote scientific and engineering knowledge relating to plastics worldwide and to educate industry, academia, and the public about these advances. SPE's Automotive Division is active in educating, promoting, recognizing, and communicating technical accomplishments in all phases of plastics and plastic-based composite developments in the global transportation industry. Topic areas include applications, materials, processing, equipment, tooling, design, and development. For more information about the SPE Automotive Div., see https://speautomotive.com/ . For more information on the Society of Plastics Engineers, see www.4spe.org.

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For more info: https://speautomotive.com/innovation-awards-competition-and-gala/ Photos of the Winners, as well as large collection of SPE Automotive Division digital photography, are available for download at: https://www.flickr.com/photos/speautomotive/albums/with/72157673717033072SPE® is a registered trademark of the Society of Plastics Engineers. All other trademarks are the property of their respective owners.

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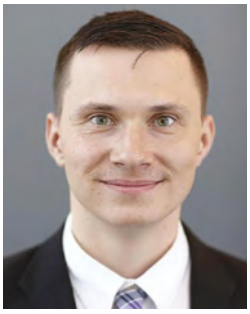

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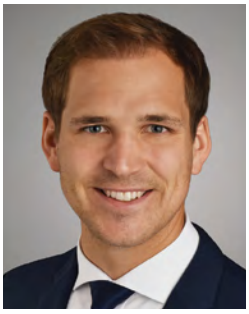

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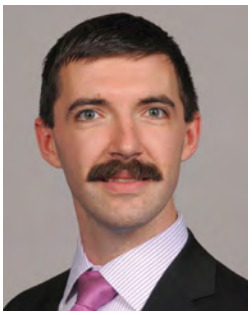

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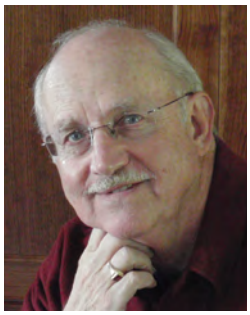

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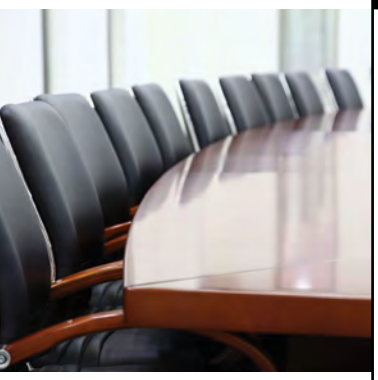

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This Issue:

See page 21 for more details