

# **193rd Technical Meeting and Educational Symposium of the Rubber Division, American Chemical Society 2018**

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8 - 10 May 2018

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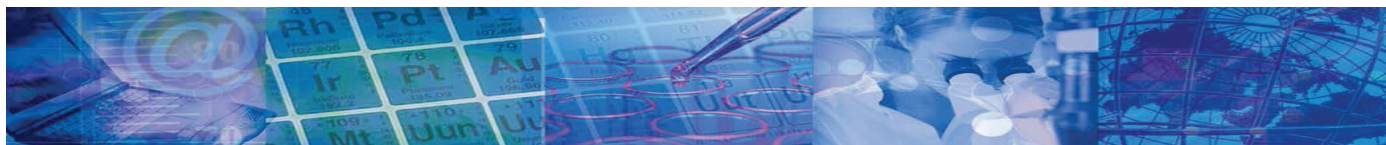
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Tuesday, May 8 – Regency Ballroom CD, Second Level

**Prof. Garth L. Wilkes Colloquium – From Structure to Properties**

**Co-Chairs: Christopher G. Robertson, Endurica LLC; J. Calvin Moreland, Michelin**

- 8:00 a.m. Understanding the Structure-Morphology-Property Relations in Segmented Polyurethanes: 35 Years of Collaboration with Garth L. Wilkes – **Iskender Yilgor**, Koc University, Turkey .....1
- 8:30 a.m. Novel Isocyanate Free-based Amphiphilic Gel and their Anti-fouling and Fouling Release Properties – **Anthony B. Brennan**, University of Florida .....N/A
- 9:00 a.m. Structure-property-processing Relationships of Hydrogen bond containing Polyacrylates: From Bio-inspired Block Copolymers to 3D Printed Networks – **Joseph Dennis**, IBM .....29
- 9:30 a.m. **Break & Table Top Exhibits in Regency Ballroom AB**
- 9:45 a.m. The Effects of Normal Force and Rate on Kinetic Coefficient of Friction of Elastomeric Materials – **David A. Dillard**, Virginia Tech .....42
- 10:15 a.m. Structure/Property Relationships in Electronic Polymers – **Paul Armistead**, Office of Naval Research ....59

**11:00 a.m. – 12:00 p.m. KEYNOTE ADDRESS (Open To All Attendees):**



**Topic: Simulation of tire and tire/vehicle performance – what's in it for materials folks? .....80**

Ron Kennedy is currently the Managing Director of the Center for Tire Research (CentiRe), an industry/university consortium involving Virginia Tech, the University of Akron, and tire and tire-related companies. In his position, he provides administrative oversight, communication with industry members and faculty, and promotion of the Center. He also has the great opportunity to work with graduate students as they pursue their tire related studies. Before joining CentiRe four years ago, Ron worked for 37 years in the tire industry at Firestone, Bridgestone/Firestone, and Hankook Tire performing tire finite element methods development and software programming, simulation systems development, advanced tire design, and tire factory uniformity studies. His work has covered the range of tire performance areas, manufacturing, and design. Ron received his BS and MS degrees in Engineering Mechanics from the University of Wisconsin, and his PhD in Mechanical Engineering from the University of Akron.

**12:00 p.m. Lunch Break & Table Top Exhibits**

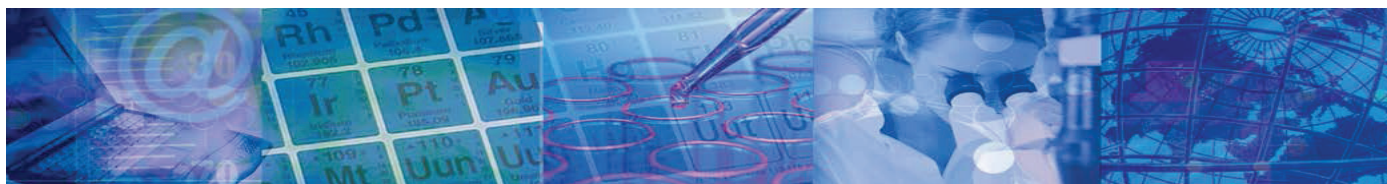
- 1:15 p.m. Development of Attenuate, a Sound and Vibration Absorbing Material – **Joan T. Muellerleile**, Independent Consultant .....109
- 1:45 p.m. Perspective on Polymer Science in the Tire Industry – **Christopher G. Robertson**, Endurica, LLC .....121

**New Trends in Carbon Materials**

**Co-Chairs: C. Jeffrey Lin, Eastman Chemical Corporation**

- 2:15 p.m. Graphenes: View of Function & Rubber Application – **Jiaxi Li**, Cabot Corporation .....147
- 2:45 p.m. Facile and Sustainable Functionalization Method for Preparing sp<sup>2</sup> Carbon Allotropes with Different Solubility Parameters – **Maurizio Galimberti**, Polytechnic, Milano, Italy .....158
- 3:15 p.m. **Break & Table Top Exhibits in Regency Ballroom AB**
- 3:30 p.m. Playing with Chemistry on sp<sup>2</sup> Carbon Allotropes: Domino Reactions for Tailor Made Functionalization – **Vincenzina Barbera**, Politecnico de Milano, Italy .....191
- 4:00 p.m. Recovered Carbon Black - Is It for Real – **William Cole**, Delta-Energy Group, LLC .....225
- 4:30 p.m. Studying the Structural Evolution of Carbon Black Filler Networks Subjected to High Shear using Combined Experimental Techniques – **Lewis Tunncliffe**, Birla Carbon .....233





Wednesday, May 9 – Regency Ballroom CD, Second Level

### **Rubber Mechanics – Fatigue and Testing**

**Chair: William V. Mars, Endurica, LLC**

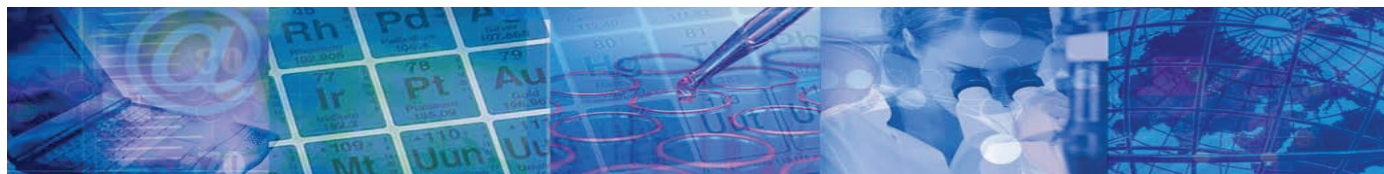
- 8:00 a.m. Optimization of the Specimen Shape Factor for Dynamic Mechanical Analysis Tests to Measure the Viscoelastic Properties of Elastomers – **Roja Esmaeeli**, The University of Akron .....N/A
- 8:30 a.m. Influence of the Temperature on Fatigue of Filled Natural Rubber – **Jean-Benoit Le Cam**, University of Rennes, France .....N/A
- 9:00 a.m. Finite Element Modeling and Critical Plane Analysis of a Cut and Chip Experiment for Rubber – **Christopher G. Robertson**, Endurica, LLC .....248
- 9:30 a.m. Finitely Scoped, High Reliability Fatigue Crack Growth Measurements – **Joshua R. Goossens**, Tenneco .....267
- 10:00 a.m. Break
- 10:15 a.m. Residual Fatigue Life Calculations for Elastomers in Digital Twin Applications – **William V. Mars**, Endurica, LLC .....N/A
- 10:45 a.m. Characterization of Elastomers using Dynamic Mechanical Methods – **Troy Nickel**, TA Instruments .....275
- 12:00 p.m. **Science & Technology Awards Banquet**

### **SCIENCE & TECHNOLOGY AWARD WINNERS PRESENTATIONS**

**Chair: Dr. Maria D. Ellul, ExxonMobil Chemical Co. (retired)**

- 2:15 p.m. Charles Goodyear Medal – **Dr. Eric Baer**, Novel Elastomeric Systems Having Diverse Applications .....288
- 3:15 p.m. Melvin Mooney Award for Distinguished Technology – **Dr. Joseph Padovan**, 2018 Career Synoptic .....311
- 3:45 p.m. Sparks-Thomas Award – **Dr. Megan Robertson**, Sustainable Thermoplastic Elastomers Derived from Vegetable Oil-Based Feedstocks .....N/A
- 4:15 p.m. Break
- 4:30 p.m. George Stafford Whitby Award for Distinguished Teaching and Research – **Dr. Joey Mead**, Nanomanufacturing: Enabling New Applications Through Tailored Nanostructures .....325
- 5:00 p.m. Chemistry of Thermoplastic Elastomers Award – **Dr. Steven Smith**, Development of Elastomeric Materials for Science and Product Applications .....346
- 5:30 p.m. Fernley H. Banbury Award – **Reinhold Kipscholl**, Self Heat-up and Resulting Mechanical Behavior of Rubber Parts .....362





Thursday, May 10 – Regency Ballroom CD, Second Level

### **Advances in Synthesis of Elastomers, Liquid Rubbers and Related Materials**

**Co-Chairs: Roderic Quirk, University of Akron; Rudolf Faust, University of Massachusetts Lowell; Taejun Yoo, Total Cray Valley; Sergio Corona-Galvan, Repsol**

- 7:45 a.m. Solution SBR - Historical Perspective and Advances – **Roderic P. Quirk**, The University of Akron .....378
- 8:15 a.m. Functionalization of Styrene-Butadiene Rubber by Radical Processes and by Mild Catalytic Means – **Sergio Corona-Galvan**, Repsol .....394
- 8:45 a.m. Molecular Engineering with Anionic Polymerization – **Lian Hutchings**, Durham University, United Kingdom .....410
- 9:15 a.m. Oligomeric Diene Resin Technology – **Herbert S. Chao**, Total Cray Valley .....429
- 9:45 a.m. Break
- 10:00 a.m. Anionic Synthesis of Trans- $\beta$ -farnesene and its Molecular Dynamics – **Taejun Yoo**, Total Cray Valley .....444
- 10:30 a.m. Controlled/Living Cationic Polymerization and Polyisobutylene-Based Elastic Functional Materials – **Yixian Wu**, Beijing University, China .....N/A
- 11:00 a.m. Academic-Industry Collaborative Innovation - on New Polymerization Catalyst-Initiation System – **Jack Emert**, Chempat Consulting .....456
- 11:30 a.m. Synthesis and Biostability of Poly(ethylene-butylene) Based Thermoplastic Polyurethanes – **Rudolf Faust**, University of Massachusetts Lowell .....472
- 12:00 p.m. Lunch Break

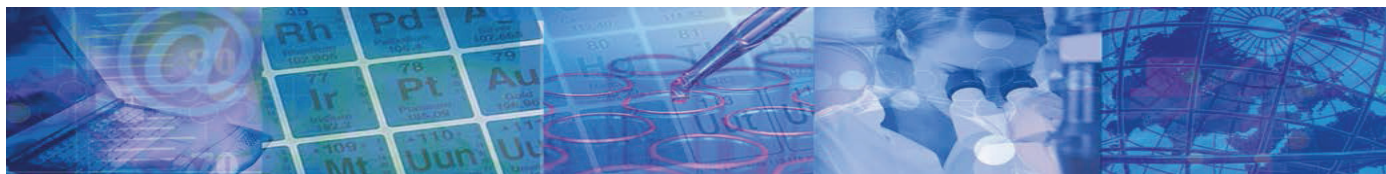
### **Engineering with Rubber**

**Chair: Abraham Pannikottu, American Engineering Group (AEG)**

- 1:00 p.m. EPDM Formulation Development and Optimization for Dense Profile Application – **Greg Li**, Dow Elastomers .....482
- 1:30 p.m. Carbon Black Reinforcement of Rubber for Anti-vibration Applications – **Lewis Tunnicliffe**, Birla Company .....493
- 2:00 p.m. Graphene and Cellulose as the Next Generation of Reinforcing Fillers in Automotive Rubber Applications – **Cindy Barrera**, Ford Motor Company .....508
- 2:30 p.m. Very High Molecular Weight EPDM for Demanding (automotive) Applications – **Niels van der Aar**, Arlanxeo .....521
- 3:00 p.m. Break







### Contributed

**Chair: C. Jeffrey Lin, Eastman Chemical Corporation**

- 3:15 p.m. Evaluation of Reclaimed Silicone Polymer in HCR Silicone Compounds – **Erick Sharp**, ACE Products & Consulting, LLC .....535
- 3:45 p.m. Polyoctenamere as Processing Additive in the Rubber Industry – **Peter Hannen**, Evonik Resource Efficiency GmbH, Germany .....548
- 4:15 p.m. Water Activated Dry Film Rubber Assembly Lubricant – **Thomas McGuckin**, International Products Corporation .....N/A
- 4:45 p.m. Characterization of Rubber Polymers and Compounds using a Rubber Process Analyzer (RPA) – **Alina K. Latshaw**, TA Instruments .....557

**Interested in more training opportunities?  
Visit [rubber.org/upcoming-training](http://rubber.org/upcoming-training) for details about these upcoming courses!**

Failure Analysis of Rubber & Plastics by Physical and Chemical Analysis - May 11; Akron, OH  
Essentials of Rubber Technology - May 14; Akron, OH  
Silicone Rubber Chemistry and Technology - May 14; Akron, OH  
Compound Mixing and Consistency - May 15; Akron, OH  
Establishing a Rubber Molding Process - May 15; Akron, OH  
Applied Rubber Technology - May 16 & 17; Akron, OH

We will also be featuring an Educational Symposium during our International Elastomer Conference October 9-11 in Louisville, KY. Visit [rubberiec.org](http://rubberiec.org) for details.

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