December 2019

# **Society for the Advancement of**

### **Material and Process Engineering**



**New Jersey Chapter** 

We are pleased to present the following speaker for our December 5th Meeting

# Rapid Evaluation of Energy Absorbing Materials for Head Borne Impact Protection

John Weber, PhD
Senior Engineer, Advanced Engineering
Group
Gentex Corporation

### **Abstract**

As researchers continue to improve our understanding of the factors contributing to Traumatic Brain Injury (TBI) due to blunt impacts to the head, the protective helmets used to prevent these injuries must adapt to evolving performance requirements. A critical

factor in the impact performance of any helmet system is the material composing the energy absorbing (EA) liner. There are a plethora of existing EA materials and new materials are continuously being synthesize and marketed for use in EA liners. Evaluating EA materials to find the optimal material can be resource intensive both in terms of time and cost with no guarantee of performance improvement. This talk will detail the finite element analysis performed to address this problem as well as the parallel physical testing used for validation

### Biography

John Weber is a senior engineer in the Advanced Research and Development department at Gentex Corporation. John has spent the past seven years breaking both virtual and physical composite structures to better understand how they respond to dynamic loads. John earned a mechanical engineering degree from Texas A&M University followed by a PhD in mechanical engineering and Post-doctoral research at the University of Auckland. John breaks helmets at an alarming rate in the pursuit of improving blunt impact energy attenuation of both ground and aircrew helmet systems.

### **Meeting Details**

Please note that our meeting locations vary this season. <u>December's meeting will be held at Bridgewater Manor</u>.

See next page





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### **Directions to Bridgewater Manor**

### **Meeting Details**

Place: Bridgewater Manor, Bridgewater, NJ; (908) 658-3000 Time: 5:45 – 8:30 pm

Cost: \$30.00 at the door. Free for students. Cash, check and PayPal options are available. This meeting is open to all SAMPE members, spouses, guests and other interested parties. For reservations or questions, please contact Megan Casey at <a href="mailto:mbc872@gmail.com">mbc872@gmail.com</a> by noon Wednesday before the meeting. Meal options are available.

### **Directions to Bridgewater Manor:**

From I-287 north, take exit 22A (206 south). Go thru two lights, Bridgewater Manor is on right. From I-287 south, take exit 22. Make right at end of ramp. Make next left, a jughandle to cross 202/206 to go south on 202/206. Go thru three lights, Bridgewater Manor is on the right





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### 2019 – 2020 Meeting Schedule

**September 12, 2019** – Giuseppe Palmese, Drexel University

September 23-26, 2019 – CAMX, Anaheim CA

October 3, 2019 – Joe Abrantes, Evonik Corp.

**November 7, 2019** – Yuebin Guo, Rutgers

**December 5, 2019** – John Weber, Gentex

**February 6, 2020** – TBD

**March 5, 2020** – TBD

April 2, 2020 – Students Night (at Rutgers)

**May 7, 2020** – TBD

May 4-7, 2020 – SAMPE 2020, Seattle WA

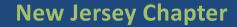
June 19, 2020 – 2<sup>nd</sup> Annual NJ Additive Manufacturing Symposium, at Rutgers Weeks Engineering Building



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ISSE - 1990 (Anaheim), 1994 (Anaheim),

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Sponsor of the Month: Jayhawk Fine Chemicals Corporation (now part of the CABB Group)

The CABB Group is a leading custom manufacturing supplier to the fine chemicals industry.

Jayhawk Fine Chemicals Corporation is now part of CABB's Custom Manufacturing Business Unit, a strategic partner to companies in the agrochemical, electronics, healthcare and and specialty sectors, providing building blocks, active ingredients and advanced intermediates.

Jayhawk offers project-based custom manufacturing services as well as a portfolio of made-to-order catalog products. The U.S. production site complements CABB's existing operations in Pratteln, Switzerland and Kokkola, Finland.

Catalog products include a family of thermoset additives sold under the JAYHAWK brand. Dianhydrides, led by JAYHAWK BTDA, find daily use as epoxy thermal curatives and comonomers for polyimide synthesis. They are a key enabler of smartphone technology, automotive electronics and advanced composites. Crosslinkers, including 2-Allylphenol and Ortho Di-allyl Bisphenol A, are creative building blocks for hybrid resin development.



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