



# SOCIETY OF AUTOMOTIVE ENGINEERS - AUSTRALASIA AND AutoCRC

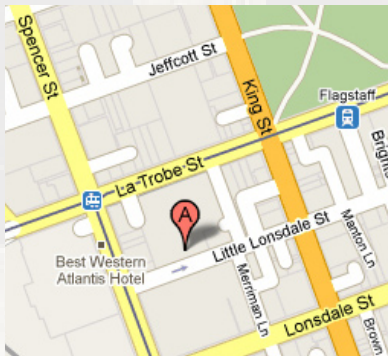
INVITE YOU TO ATTEND THE

## HIGH TECH AUTOMOTIVE COMPOSITES SEMINAR

Composite materials offer the automotive industry a “holy grail” of low mass, high strength, high performance, low cost, structural and aesthetic materials.

Composite materials vary widely in their structure and composition – the combination of fibres (carbon, glass or natural) with a matrix (resins, plastics, epoxy) can produce a vast number of different properties depending on ratio of fibre to matrix, types of materials, length and direction of fibres. This gives significant flexibility to design and manufacture of complex component geometries in single materials with varying properties throughout the component.

So why aren't Australian vehicles incorporating more composite materials? Which components are most likely to be made from composites in the future? What type of composites will we be using? What techniques will be used to make composite parts? What are the advantages of switching to composite components?



Date:	Tuesday 9th March, 2010
Time:	2pm Registration for 2.15pm start - 5.30pm Finish
Venue:	William Angliss Institute of TAFE- South Room
Address:	Please enter via 550 Little Lonsdale Street, Melbourne
RSVP:	Wednesday 3rd March, 2010 (please see attached registration form for more details)
Cost:	SAE-A Member: \$45                      SAE-A Student Member:\$25 Non- Member: \$55                      Student Non-Member: \$35
Parking:	On street parking and commercial local parking available. Public transport also available

- 2.00pm Registration
- 2.15pm Welcome Introduction
- 2.20pm Dr. Bronwyn Fox - Composites 101
- 2.30pm Mr. Jason Miller - Composites and Rapid Manufacturing – Cost and Time
- 2.50pm Dr. Shankar Kalyanasundaram - Forming Analysis of Composites
- 3.10pm Dr. Niall Finn - Textiles for Advanced Composites
- 3.30pm Afternoon Tea
- 4.00pm Ms. Ranjani Sudharsan - Crash Properties of Carbon Fibre Composite Tubes
- 4.20pm Mr. Brian Hughes - What's now? What's new?
- 4.40pm Dr. Bronwyn Fox - Opportunities to Innovate in Composite Manufacturing
- 5.00pm Group Discussion
- 5.30pm Finish

# PRESENTERS



Dr. Bronwyn Fox  
Deakin University

## Opportunities to Innovate in Composite Manufacturing.

New products made from lightweight, high strength composite materials are appearing everywhere. As predictive models have improved and in-service data has become available, engineers can now design parts with confidence in their long term performance. The new generation of aircraft, the Airbus A380 and the Boeing 787 Dreamliner both make extensive use of carbon fibre composites. This, combined with proliferation of wind farms which use composite turbine blades, has increased the demand for the carbon fibre enormously. Recent figures have predicted a 20% annual growth in the demand for carbon fibre (LUCINTEL (US) Carbon Fibre2008 Conference, Hamburg). This presentation will outline future opportunities and focus on where Australia can leverage its skills and capabilities to participate in the growth of this sector.

## Rapid Manufacturing of Composites for Automotive Applications

This presentation will take a glimpse into technological developments in composites and rapid manufacturing, with a focus on reducing cost and time involved in manufacturing composites, particularly those of interest to Futuris Automotive Interiors. Topics will include rapid manufacturing, design for manufacturing and assembly, and elegant design (integrating form, function and styling) from an automotive interiors point of view.



Mr. Jason Miller  
FUTURIS Automotive



Dr. Shankar Kalyanasundaram  
Australian National University

## Forming Analysis of Composite Manufacturing:

Key criteria in the development of new vehicles include reduction in weight, safety and improved noise characteristics. Thermoplastic composite materials have the potential to provide significant stiffness and strength at reduced weight for many automobile components. They also provide an improved impact performance compared to metals and this will result in a safer automobile. One further attractive aspect of thermoplastic-based composite materials is the ease of recycling these material systems compared to their metallic counterparts. One of the major challenges for the large scale use of these advanced material systems in automotive applications is the cost and time associated with manufacturing of components. In this presentation, a research perspective will be presented to gain a fundamental understanding of the forming process of these material systems and the challenges that need to be overcome.

## Textiles For Advanced Composites

The fibre in Fibre Reinforced Composites can come in many textile forms including loose short fibres, non-woven felts or mats, woven rovings or yarns, knitted preforms, and highly aligned non-crimp fabrics. Each textile type has different properties and these have different influences on processing and product behaviour. This talk will briefly outline these differences and discuss some of the research at CSIRO in this field and how it is applied to automotive engineering.



Dr. Niall Finn  
CSIRO

## Crash Properties of Carbon Fibre Composite Tubes

The demand to reduce fuel emissions has led automobile manufacturers worldwide to investigate lightweight materials such as composites, metallic foams, sandwich structures etc., which could replace the traditional metallic structures. While choosing an alternative material for crash members such as bumpers and crash rails, it is important to understand the crashworthiness of such materials. Composites have great potential to be used as crash members when compared to metals due to their high energy absorption values. Carbon fibre composites have already been used as crash energy absorbers in racing cars. The focus of this presentation is to explain the energy absorption characteristics of carbon fibre composite tubes during tensile, indentation, axial impact as well as angular impact conditions. These results will aid in designing an efficient crash structure by implementation into a commercial finite element analysis package.



Ranjani Sudharsan  
Deakin University

## Current Composite Technologies

CME is a specialist in the use of composite materials and is a Tier 1 supplier to the automotive industry. Targeting weight reduction as its primary focus, CME looks to replace traditional materials such as steel and aluminum using composite materials. Brian Hughes will discuss the use of composite materials in the automotive industry, the issues facing the use of composites in the automotive industry in the short to medium term and the technologies needed to meet the long term needs of the industry.



Mr. Brian Hughes  
Composite Material Engineering



# REGISTRATION FORM

## HIGH TECH AUTOMOTIVE COMPOSITES REGISTRATION FORM MUST BE ACCOMPANIED BY PAYMENT

FULL REGISTRATION	STUDENT REGISTRATIONS		
SAE-A MEMBER: \$45	SAE-A STUDENT MEMBER:	\$25	
NON - MEMBER: \$55	SAE-A STUDENT NON MEMBER:	\$35	

### PARTICIPANT DETAILS

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
\_\_\_\_\_ POSTCODE \_\_\_\_\_  
PHONE \_\_\_\_\_  
EMAIL \_\_\_\_\_

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PLEASE CHARGE MY CREDIT CARD FOR THE AMOUNT OF \$ \_\_\_\_\_

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VISA & MASTERCARD SURCHARGE 2% AMEX SURCHARGE 3%

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EXPIRY DATE \_\_\_\_\_

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Cancellation: there will be no refunds given, however a substitute attendee may be nominated. Upon receipt of this registration form, you will be contacted with confirmation of your registration and a tax invoice will be receipted for your payment

Please forward this completed form to SAE-A on  
Email: [marissa@sae-a.com.au](mailto:marissa@sae-a.com.au) or  
Send to Suite B, Level 2 - 70 Dorcas Street, Southbank VIC 3006  
Phone (03) 9696-5190    FAX (03) 9696-5865