

# 2008 SAE *Motorsports Engineering* Conference

December 2-4, 2008

The Embassy Suites Charlotte-Concord Golf Resort & Spa  
Concord, North Carolina, USA

## Keeping You Ahead – Racing Technologies YOU Need to Know

The Motorsports Industry Technical Event Focusing On:

- Aerodynamics
- Vehicle/Chassis
- Suspension/Tires
- Green Motorsports
- Materials
- Powertrain
- Safety
- Testing
- Simulation
- Sanctioning Bodies/Event Management

**Pre-Register** by November 14, 2008  
SAE Members Save \$400 off of the  
full conference fee;  
Non-Members Save \$100

Inside – Information about this must-attend event.

[www.sae.org/events/msec](http://www.sae.org/events/msec)





## EVENT OVERVIEW

# 2008 SAE Motorsports Engineering Conference

December 2 – 4, 2008

Keeping You Ahead –  
Racing Technologies YOU Need to Know

The SAE Motorsports Engineering Conference is returning to its roots by offering a technical program that is invaluable to the working engineers and engineering managers in the motorsports industry - a technical program that has been defined and organized by EXPERTS WORKING IN THE MOTORSPORTS INDUSTRY and delivers high-quality, practical information.

Experience the ONLY Technology Centered Industry Event Designed for the Motorsports Engineer ... **all in the Charlotte, North Carolina area - a globally recognized center for racing, high performance and engineering excellence!**

### BENEFITS OF ATTENDING

- Address advances in racing technology in the technical sessions
- Gain insight on the latest techniques and solutions in motorsports
- Participate in working groups to address industry needs and set future direction
- Network with your peers – motorsports professionals from race teams, test facilities, sanctioning bodies, suppliers, major manufacturers and OEMs.

### WHO SHOULD ATTEND

- Engineers
- Researchers
- Engineering Management
- Technicians
- Corporate Executives
- Academia
- Event Organizers
- Officials
- Drivers & Crews

From OEM's, Suppliers, Race Teams, and Sanctioning Bodies

**SAE INTERNATIONAL - THE ENGINEERING INTERSECTION BETWEEN RACING AND THE TRANSPORTATION INDUSTRY.**

*Visit [www.sae.org/msec](http://www.sae.org/msec) for the most up-to-date information on the 2008 SAE Motorsports Engineering Conference*

## EVENT - AT - A - GLANCE

Tuesday, December 2	Wednesday, December 3	Thursday, December 4
8:00 – 9:00 a.m. <b>Opening Reception &amp; Keynote Address</b>	8:00 – 10:00 a.m. <b>Safety Panel</b>	8:00 – 10:00 a.m. <b>Green Motorsports Panel</b>
9:00 – 9:30 a.m. Networking Break <b>Tabletop Displays Open</b>	10:00 – 10:30 a.m. Networking Break <b>Tabletop Displays Open</b>	10:00 – 10:30 a.m. Networking Break <b>Tabletop Displays Open</b>
9:30 – 11:30 a.m. <b>Sanctioning Bodies Panel</b>	10:30 – 11:30 a.m. Aerodynamics Focus Group Meeting	10:30 a.m. – 12:30 p.m. Technical Sessions
11:30 a.m. – 12:30 p.m. Technical Sessions	10:30 a.m. – 12:30 p.m. Technical Sessions	
12:30 – 2:00 p.m. Lunch <b>Tabletop Displays Open</b>	12:30 – 2:00 p.m. Lunch <b>Tabletop Displays Open</b>	12:30 – 1:00 p.m. Lunch <b>Tabletop Displays Open</b>
2:00 – 5:00 p.m. <b>SAE Motorsports Aero Challenge Workshop</b>	2:00 – 5:00 p.m. Technical Sessions	2:00 - 3:00 p.m. Safety Focus Group Meeting
	4:00 - 5:00 p.m. Vehicle/Chassis Focus Group Meeting	
2:00 – 5:00 p.m. Technical Sessions	5:00 – 6:00 p.m. <b>Networking Reception</b>	3:00 - 4:00 p.m. Powertrain Focus Group Meeting
	6:30 – 8:30 p.m. <b>Banquet</b>	2:00 – 5:00 p.m. Technical Sessions

## TECHNICAL SESSION HIGHLIGHTS

The 2008 SAE Motorsports Engineering Conference will feature progressive technical sessions focused on the issues challenging today's motorsports industry professional.

Some of the sessions in development include:

- Vehicle/Chassis
  - Software Analysis
  - Tires
  - Virtual tools, data acquisition, instrumentation
- Aerodynamics
  - Technical Needs/Research Opportunities
  - Aerodynamic: Testing Facilities and Measurement Techniques
  - Computational Methods & Modeling (CFD)
- Powertrain
  - Advanced Combustion
  - Life Cycle & Failure Analysis
  - Diesel Engines in Competition
  - Direct Injection in Competition
  - Electronic Powertrain Control Systems
- Materials
  - Advanced Materials & Manufacturing Processes
  - Life Analysis of Composite Materials
- Green Motorsports
  - Energy balance – a different approach
  - Energy recovery (KERS)
  - Implementation of 'Green Racing'
- Testing & Simulation
  - Optimization using math-based models
  - Simulators for driver training
  - Integration of test and data acquisition with simulation
- Safety
  - Prepare to Race - The Driver/Crew Environment and Accessories
  - Designing Safer Race Cars
  - The Science of Safety
  - Facility Safety & Event Management



## PANEL DISCUSSIONS AND SPECIAL PROGRAMS

**TUESDAY, DECEMBER 2, 2008**

**9:30 – 11:30 A.M.**

### ***Sanctioning Body Panel – Is Innovation Being Outlawed?***

The state of rules-making in the age of spec components, and demands for competitive parity on the track for “entertainment” sake will be discussed by top technical personnel from a variety of sanctioning bodies.

Are these sanctioning bodies *killing* innovation in their pursuit of lower costs and close competition? Or, are they consciously *re-directing* it to give motorsports engineers new challenges?

Here’s your opportunity to hear directly from the rules makers where the future of innovation in their specific series is going...and a chance for you to ask what’s on your mind.

**Moderator:**

**Don Taylor**, NHRA

**Sanctioning Body Panel Participants:**

**Scot Elkins**, ALMS

**Mike Fisher**, NASCAR

**Jeff Horton**, IRL

**Peter Riches**, BTCC and A1GP

**Dave Spitzer**, Grand American

**Jeremy Thoennes**, SCCA Pro Racing

**WEDNESDAY, DECEMBER 3, 2008**

**8:00 – 10:00 A.M.**

### ***Safety Panel – Putting Research to Work***

Panelists representing a spectrum of motorsports safety activities will briefly discuss their role in this area of the sport and focus on how to better facilitate the implementation of new safety developments to the benefit of the end users.

The panel will include representatives from research, event administration, medical, first response, safety equipment standards and competition. The panel will be supported by other safety experts in motorsports attending the conference. The session will be open to questions from the audience.

**Moderator:**

**Dr. John Melvin**, Tandelta

**Safety Panel Participants:**

**Daniel L. Jones**, Chapel Hill Fire Department

**Arnold S. Kuhns**, SFI Foundation

**Andrew Mellor**, Federation Internationale de L’Automobile

**Dr. Stephen E. Olvey**, University of Miami



## THURSDAY, DECEMBER 4, 2008

8:00 – 10:00 A.M.

### **Green Motorsports Panel – Alternative Fuels to Energy Recovery**

A discussion on advancing environmental technologies in motorsports while maintaining both the spectacle and the safety requirements?

Is professional motorsports being conducted for its own sake or is there a real benefit to be gained by the transfer of environmental racing technology into the passenger vehicle and transportation sector? With the ever growing concerns regarding the environmental impact of transportation, motorsports is coming under increasing scrutiny from both the public and those that see little correlation to road transportation. The panelists bring a breadth of knowledge to this debate from both the technical delivery viewpoint as well as the consumer. How the technologies can be developed and then fast tracked from the racing world to passenger vehicle development is a question that will be raised and explored.

Safety concerns are another topic that will be discussed as these new technologies have their own, often unique, requirements which are completely new to the traditional liquid fuel racing environment.

#### **Moderator:**

**Tim Holland**, Lotus Engineering Inc.

#### **Green Racing Panel Participants:**

**Ian Bamsey**, Race Engine Technology Magazine

**Ted Bohn** (invited), Argonne National Labs.

**Doug Cross**, Flybrid Systems LLP

**Doug Robinson**, IMSA

**Jamie Turner**, Lotus Engineering Inc.

**Peter Wright**, FIA

## THE SAE MOTORSPORTS AERO CHALLENGE

### ***Comparison and Evaluation of Aerodynamic Tools for the Race Car Industry***

There are a number of areas of race car aerodynamics that would benefit from a better understanding of the fundamentals. A series of evaluations is planned combining both experimental and numerical methodologies on several, common race car chassis. Special emphasis will be placed on understanding the physics and applications. Resulting benefits impact the wind tunnel facilities, the CFD coders and the race teams to ultimately improve performance. We have laid out a seven step process and welcome participation and contributions. Join us and be on the leading edge of the technical developments. For additional details and to request additional information, visit [www.sae.org/events/mec/aerochallenge.htm](http://www.sae.org/events/mec/aerochallenge.htm) or contact Bob Welge, [bobw@robertsengineeringdevelopment.com](mailto:bobw@robertsengineeringdevelopment.com) or by phone, 714-593-2312.

## **AERO CHALLENGE WORKSHOP AT THE 2008 SAE MOTORSPORTS ENGINEERING CONFERENCE**

### **TUESDAY, DECEMBER 2, 2008**

2:00 – 5:00 P.M.

The SAE Motorsports Aero Challenge topic for 2008 is **“Race Cars in Proximity”** and is a comparison and evaluation of aerodynamic tools for the racecar industry. Interest in participating has been expressed from a full spectrum of industry including racing teams, engineering companies, universities, wind tunnel facilities and the CFD developers. We will meet in person as a working group to solidify the details and begin to produce results. Please join us and participate.

For additional information visit the 2008 SAE Motorsports Engineering Conference website at [www.sae.org/events/msec](http://www.sae.org/events/msec)

# TECHNICAL SESSION WEEK-AT-A-GLANCE

Session Title	Tues am	Tues pm	Wed am	Wed pm	Thurs am	Thurs pm	Room
Advanced Combustion (MSEC9)	-	-	-	✓	-	-	Concord C
Advanced Materials and Manufacturing Processes (MSEC19)	-	✓	-	-	-	-	Concord C
Aero Challenge Workshop (MSEC33)	-	✓	-	-	-	-	Concord D
Aerodynamics - Computational Methods and Modeling - Part 1 (MSEC8)	-	-	-	-	✓	-	Concord D
Aerodynamics - Computational Methods and Modeling - Part 2 (MSEC8)	-	-	-	-	-	✓	Concord D
Aerodynamics Focus Group Meeting (MSEC34)	-	-	✓	-	-	-	Concord D
Aerodynamics Technical Opportunities, Needs and Testing (MSEC6)	-	-	-	✓	-	-	Concord D
Designing Safer Racecars (MSEC27)	-	✓	-	-	-	-	Concord B
Diesel Engines in Competition (MSEC10)	✓	-	-	-	-	-	Concord C
Direct Injection in Competition (MSEC11)	-	-	-	✓	-	-	Concord C
Facility Safety and Event Management (MSEC26)	-	-	-	-	✓	-	Concord B
Green Motor Sports - Part 1 (MSEC22)	-	-	-	-	✓	-	Concord C
Green Motor Sports - Part 2 (MSEC22)	-	-	-	-	-	✓	Concord C
Green Motorsports Panel (MSEC32)	-	-	-	-	✓	-	Concord B
Keynote Address - Motorsport and the Environment - Challenge or Compromise (MSECK1)	✓	-	-	-	-	-	Room TBD
Powertrain Testing and Measurement (MSEC18)	-	-	-	✓	-	-	Concord C
Powertrain/Green Racing Focus Group Meeting (MSEC36)	-	-	-	-	-	✓	Concord C
Prepare to Race - The Driver/Crew Environment and Accessories (MSEC25)	-	-	✓	-	-	-	Concord B
SAE Motorsports Engineering Conference Vehicle/Chassis Group Meeting (MSEC37)	-	-	-	✓	-	-	Carolina B
Safety Focus Group Meeting (MSEC35)	-	-	-	-	-	✓	Concord B
Safety Panel - Safety is no Accident. (MSEC30)	-	-	✓	-	-	-	Concord B
Sanctioning Bodies Panel (MSEC31)	✓	-	-	-	-	-	Concord B
Sanctioning Bodies and Event Management (MSEC23)	✓	-	-	-	-	-	Room TBD
Suspension and Handling (MSEC2)	-	✓	-	-	-	-	Carolina B
Testing and Simulation - Chassis Part 2 (MSEC24)	-	-	-	-	✓	-	Carolina B
Testing and Simulation - General Part 3 (MSEC24)	-	-	-	-	-	✓	Carolina B
Testing and Simulation - Powertrain Part 1 (MSEC24)	-	-	✓	-	-	-	Concord C
The Quest for Speed (MSEC29)	-	✓	-	-	-	-	Concord C
The Science of Safety - Part 1 (MSEC28)	-	-	-	✓	-	-	Concord B
The Science of Safety - Part 2 (MSEC28)	-	-	-	-	✓	-	Concord B
Vehicle Design (MSEC1)	-	-	✓	-	-	-	Carolina B
Virtual Tools, Data Acquisition, Instrumentation (MSEC4)	-	-	-	✓	-	-	Carolina B

# SESSIONS TECHNICAL, BUSINESS & EXECUTIVE

---

## Keynote Address - Motorsport and the Environment - Challenge or Compromise

8:00 a.m.

---

## Sanctioning Bodies Panel

9:30 a.m.

Is innovation being outlawed? The state of rules-making in the age of spec components and demands for competitive parity on the track will be discussed by technical personnel from a diverse group of sanctioning bodies

### Moderators:

Don Taylor, NHRA

### Panelists:

Scot Elkins, IMSA

Michael Edward Fisher, NASCAR

Jeff H. Horton, Indy Racing League

Peter P C Riches

Jeremy J. Thoennes, SCCA Pro Racing

---

## Diesel Engines in Competition

11:30 a.m.

This session covers all aspects of diesel engines in competition.

### Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC

## Fast Prototyping of a Racing Diesel Engine Control System

Enrico Corti, Giulio Cazzoli, Matteo Rinaldi, Luca Solieri, Univ. of Bologna

---

## The Quest for Speed

12:00 p.m.

This is a session that describes the engineering involved in many of the systems of the vehicle and how they are brought together to produce the final racing machine. It covers competitions in general and speed record attempts in particular.

### Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC

## Design and Development of the BUB 7 Land Speed Record Motorcycle

Joseph H. Harralson, California State Univ-Sacramento

---

## Advanced Materials and Manufacturing Processes

2:00 p.m.

This session covers advanced materials and processes that are, or could be used in high performance and race powertrains.

### Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC; Christopher E. Shaw, Visteon Corp.

## Extremeions Type V Carbon Raptor Nano-Crystalline Diamond Thin Film Coating for Exhaust Valve Applications (Oral Only)

Darren R. Burgess, George Barr, Anatech, Ltd.

## Determining the Effect of Material Properties on Operating Temperatures of Fiber Reinforced Internal Combustion Engine Poppet Valves

Donald W. Radford, Colorado State Univ.

## Aluminum Casting Materials Processes (Oral Only)

Paul James Fricker, Grainger & Worrall, Ltd.

## Hone and Surface (Oral Only)

Chris P. Sauer, Nagel Precision Inc.

## Fastener Technology - How Fastner Science Effects Cyl Head Lifting (Oral Only)

Don Trapp, A1 Technologies

---

## Aero Challenge Workshop

2:00 p.m.

The SAE Motorsports Aero Challenge topic for 2008 is Race Cars in Proximity and is a comparison and evaluation of aerodynamic tools for the racecar industry. Interest in participating has been expressed from a full spectrum of industry including racing teams, engineering companies, universities, wind tunnel facilities and the CFD developers. We will meet in person as a working group to solidify the details and begin to produce results. Please join us and participate.

### Organizers:

H. Robert (Bob) Welge, Robert's Engineering Development; Thomas N. Ramsay, Honda R&D Americas Inc.

---

## Designing Safer Racecars

2:00 p.m.

Presentations look at systems and materials that help improve racecar safety performance.

### Organizers:

John W. Melvin, Tandelta; J. Kirk Russell

## Stock Car Racing Driver Restraint Development and Implementation of Seat Performance Specification

John Patalak, NASCAR; John Melvin, Tandelta

## Strength Testing of Inside Nets (Oral Only)

Gregg S. Baker, GTP

## RallyCar Occupant Protection (Oral Only)

Andrew Mellor, Federation Internationale de L'Automobil

## Shape Memory Composites Applied to the Construction of a Conformable Racing Car Seat

Patrick Devin Leahy, Allyson Antonio, Donald W. Radford, Colorado State University

## IMPAXX\* Energy Absorbing Foam for Enhanced Driver Safety in Motorsports Door Applications

Myron John Maurer, Dow Chemical Co.



# SESSIONS TECHNICAL, BUSINESS & EXECUTIVE

## **Self-Reinforced Polypropylene Composites - A new class of material for the motorsports industry**

Heather Hayes, Milliken & Co.

---

## **Suspension and Handling**

2:00 p.m.

Analysis, design, development, and manufacturing of suspension systems and components

Organizers:

Paul Haney, InfoTire; David A. Finch, Raetech Corp.

## **An Application of Traction Vectoring to a Formula SAE Car**

Rob Tarlton, Steven Ward, Michael Bentz, Univ of Illinois at Urbana-Champaign; Norman R. Miller, Univ. of Illinois at Urbana-Champaign; David Cox, Thomas Becker, Univ of Illinois at Urbana-Champaign

## **Suspension Geometry: Theory vs K & C Measurement**

William C. Mitchell, William C Mitchell Software

## **A New Method to Evaluate Bump Steer and Steering Influence on Kinematic Roll and Pitch Axes for All Independent Suspension Types**

Ganesh Mohan, Claude Rouelle, OptimumG

## **Design and Development of an Optimized, Passive Camber System for Vehicles**

James F. Cuttino, Maruti Nandan Sinha, Univ. of North Carolina Charlotte

## **State Transition Diagrams of Transient Roll and Pitch**

Austin Dvorak, Patrick Fitzhorn, Colorado State Univ

## **Exploring the Effect of Manufacturing Tolerances on the Front Suspension Performance of a Formula SAE Vehicle Relative to Design Targets**

Andrew John Prusinowski, University of Michigan

---

## **Sanctioning Bodies and Event Management**

This session includes presentations and papers featuring technical issues facing sanctioning bodies in their rules and conduct of race events.

Organizers:

Don Taylor, NHRA; Jeremy J. Thoennes, SCCA Pro Racing

Assistant Chairpersons:

Jeremy J. Thoennes, SCCA

## **Changes to FIM-MOTOGP Rules to Reduce Costs and Make Racing More Directly Relevant to Road Motorcycle Development (Written Only -- No Oral Presentation)**

Alberto Boretti, Univ. of Melbourne

SAE International, the society dedicated to advancing mobility engineering worldwide, would like to invite you to participate in a focus group meeting designed to set the direction of SAE's motorsports technology offerings. SAE is focused on providing leading edge technical information in the form of technical papers, conferences, symposiums, seminars, standards, books and publications. This focus group will follow a process of open discussion, brainstorming, prioritization, definition and selection of leadership. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Please check Event-at-a-Glance or Session Listings for additional information topics, dates, and times.

NOTE: This is a preliminary schedule. Session and session times subject to change without notice. For the most-up-to-date information visit [www.sae.org/msec](http://www.sae.org/msec)



**SESSIONS** TECHNICAL, BUSINESS & EXECUTIVE**Safety Panel - Safety is no Accident.**

8:00 a.m.

Safety is no accident - The world's leading motor sports safety engineers want to share the results of their research with you.

**Moderators:**

John W. Melvin, Tandelta

**Panelists:**

Jim Downing, Downing Atlanta Inc.  
Daniel L. Jones, Chapel Hill Fire Department  
Arnold S. Kuhns, SFI Foundation  
Andrew Mellor, Federation Internationale de L'Automobil  
Stephen E. Olvey, Univ. of Miami

**Aerodynamics Focus Group Meeting**

10:30 a.m.

SAE is focused on providing leading edge technical information. This focus group will follow a process of open discussion, brainstorming and prioritization. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

**Moderators:**

John Miller, SAE International

**Prepare to Race - The Driver/Crew Environment and Accessories**

10:30 a.m.

Presentations covering a variety of subjects that affect motor sport safety.

**Organizers:**

John W. Melvin, Tandelta; J. Kirk Russell

**Jack Stands in North American Rally A Design Proposal**

Mike Johnston, Kevin Martin, Jennifer Johrendt, University of Windsor

**Crash Recorders in Racing - An Overview**

Thomas W. Gideon, General Motors Corp.

**Engineering The Driver**

Ross Bentley

**Occupant Compartment Updates for Side to Side Vibration in a Fuel Funny Car**

Trevor Ashline, Safety Solutions; John Melvin, Tandelta; Kris Vangilder, ISP Innovative Safety Products

**Testing and Simulation - Powertrain Part 1**

10:30 a.m.

This session covers some of the simulations that are powertrain related. Specifically, it has two papers on predicting the performance of a top fuel dragster and an oral presentation on a simulation package on rotating powertrain assemblies. Simulation enables engineers to predict how a new design will perform by combining math-based methods with insight into to existing designs. Testing serves to confirm the behavior of the new design using physical hardware. Testing and simulation as two essential engineering methods for motorsports go hand in hand. This session discusses leading edge applications of testing and simulation as well as best practices for leveraging a combination of the two to achieve ever greater performance.

**Organizers:**

Wensi Jin, The MathWorks Inc.; Edward M. Kasprzak, SUNY-Buffalo

**Top Fuel Dragster Powertrain Modeling**

Thomas Charles Stone, Lex Joon Racing; Matthew Best, Loughborough Univ; Sebastian Visser, Lex Joon Racing

**A Nonlinear Model for Top Fuel Dragster Dynamic Performance Assessment**

Pol Spanos PhD, Rice University; David Hernández, Tecnológico de Monterrey; Richard Tapia PhD, Rice University

**Presentation of EXCITE simulation software-rotating systems. Rotating assembly analysis & simulation (Oral Only)**

Andrew C. Martin, AVL Powertrain Engineering Inc.

**Vehicle Design**

10:30 a.m.

Analysis, design, manufacture, and development of racecar structures.

**Organizers:**

Paul Haney, InfoTire; David A. Finch, Raetech Corp.

**Welding in Racecar Design (Oral Only)**

Jeffrey R. Mallat, Siemens Power Generation Inc.

**3D Laser Scanning in Racing Vehicle Design (Oral Only)**

Kevin N. Outz, Matrix CAD Design Inc.

**Mechanical Coupling Due to Composite Structural Damage and Repair**

Donald W. Radford, Colorado State Univ.

**Terminology and Manufacturing Methods of MIL/AMS-T-6736B Frame Tubing**

Eric Rayner, Plymouth Tube Co

**Advanced Combustion**

2:00 p.m.

This session covers some of the many aspects of airflow and combustion as they apply to high performance and race engines.

**Organizers:**

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC

**Tumble Meter Development**

Patrick H. Baer, Chrysler LLC

**Top Land Crevice and Piston Deflection Effects on Combustion in a High Speed Rotary Valve Engine (Written Only -- No Oral Presentation)**

Harry Watson, Univ of Melbourne; Alberto Boretti, Univ. of Melbourne

**A Technique for Processing Cylinder Pressure and Test Bed Data Sets for Engine Speed-Sweep Tests to Allow Reduced Testing Time with Enhanced Interpretation of Results**

Gary J. Patterson, AVL North America Inc.

**The Effects of Intake Plenum Volume on the Performance of a Small Normally Aspirated Restricted Engine**

Leonard Joseph Hamilton, Jasen Lee, US Naval Academy

**SESSIONS** TECHNICAL, BUSINESS & EXECUTIVE**Aerodynamics Technical Opportunities, Needs and Testing**

2:00 p.m.

The Session will contain technical discussions on progress toward understanding aerodynamic technical issues that are contributors to improved racing vehicle performance. Current research unknowns and research opportunities will be discussed. Improved testing techniques and facilities will be presented.

Organizers:

H. Robert (Bob) Welge, Robert's Engineering Development; Peter Thomas Tkacik, Univ. of North Carolina Charlotte; Thomas N. Ramsay, Honda R&D Americas Inc.

**The Influence of Model Motion on the Simulation of Vehicle Dynamics - presentation from SAE 2008 World Congress (SAE paper # 2008-01-0657) (Oral Only)**

Peter Aschwanden, RUAG Aerospace

**Racecar Front Wing Aerodynamics**

Wael Mokhtar, Jonathan Lane, Lake Superior State Univ.

**The use of a Bluff Body Wake Generator for Wind Tunnel Studies of NASCAR Drafting Aerodynamics**

Robert G. Dominy, Durham Univ.; Geoffrey Le Good, G L Aerodynamics Ltd

**Design of a Continuous Flow Water Channel for Fluid Dynamics Research**

Peter Thomas Tkacik, Univ. of North Carolina Charlotte

**Direct Injection in Competition**

2:00 p.m.

This session covers all aspects of the use of direct injection on gasoline engines in motor sports.

Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC

**Comparison of PFI and DI Superbike Engines (Written Only -- No Oral Presentation)**

Alberto Boretti, Univ. of Melbourne; Harry Watson, Univ of Melbourne

**Powertrain Testing and Measurement**

2:00 p.m.

This session covers some of the advanced techniques being used in engine dynamometer test and development.

Organizers:

Lee Carducci, Power-Tec Engineering

**Crank Angle Resolved Friction Measurements on a Motored Floating Liner Engine (Oral Only)**

Bryan O'Rourke, Colorado State Univ; Donald W. Radford, Colorado State Univ.

**Advantages and benefits of transient dyno testing to accelerate engine development (Oral Only)**

Don Swetzig, AVL North America Inc.

**Techniques and hardware for hi-speed combustion measurement and analysis (Oral Only)**

Gary J. Patterson, AVL North America Inc.

**The Science of Safety - Part 1**

2:00 p.m.

This sessions presentations cover research and development activities on a variety of safety related issues.

Organizers:

John W. Melvin, Tandelta; J. Kirk Russell

**Recognition, Treatment, and Prevention of Mild Traumatic Brain Injury in Motor Sports (Oral Only)**

Stephen E. Olvey, Univ. of Miami

**New Sensors to Track Head Acceleration During Possible Injurious Events**

Ted Knox, US Air Force

**Improving Earpiece Accelerometer Coupling to the Head**

Robert Salzar, Univ of Virginia; Joseph A. Pelletiere, US Air Force; Cameron Bass, Univ of Virginia

**Wireless Acceleration and Impact Recording Chips**

Ted Knox, AFRL; Navid Yazdi, Evigia Systems; John A. Plaga, Wright-Patterson Air Force Base

**Recent Developments in Karting Safety (Oral Only)**

Hubert Gramling, FIA Institute

**Failure Analysis of NASCAR Racecar Components (Oral Only)**

Samuel C. Pendergrass, Metallurgical Technologies Inc.

**Virtual Tools, Data Acquisition, Instrumentation**

2:00 p.m.

The software, hardware, sensors, and methodology needed to gather and analyze vehicle data.

Organizers:

Paul Haney, InfoTire; David A. Finch, Raetech Corp.

**Tire-Ground Interaction Model for Suspension Analysis and Optimization**

Arnaud Dufournier, DUFOURNIER Technologies

**Advanced Triaxial Accelerometer for Race Car Performance Enhancement**

Thomas Connolly, Measurement Specialties

**Trail-Braking Driver Input Parameterization for General Corner Geometry**

Efsthios Velenis, Brunel University; Panagiotis Tsiotras, Georgia Institute of Technology; Jianbo Lu, Ford Motor Co

**Avoiding the Pitfalls in Motorsports Data Acquisition**

Steve Southward, Virginia Tech.; Holley Conner, Virginia Tech

**SAE Motorsports Engineering Conference Vehicle/Chassis Group Meeting**

4:00 p.m.

SAE is focused on providing leading edge technical information. This focus group will follow a process of open discussion, brainstorming and prioritization. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Organizers:

John Miller, SAE International

# SESSIONS TECHNICAL, BUSINESS & EXECUTIVE

## Green Motorsports Panel

8:00 a.m.

This panel will feature a discussion on advancing environmental technologies in motorsports while maintaining the spectacle, the sport and the safety requirements.

### Moderators:

Tim Holland, Lotus Engineering, Ltd.

### Panelists:

Michael Austin, Car and Driver Magazine  
 Ian Bamsey, Race Engine Technology  
 Douglas Cross, Flybrid Systems LLP  
 Robert Paul Larsen, Argonne National Laboratory  
 Doug Robinson, International Motor Sports Association  
 James W G Turner, Lotus Engineering, Ltd.  
 Peter G. Wright, FIA Institute for Motor Sport Safety

## Aerodynamics - Computational Methods and Modeling - Part 1

10:30 a.m.

This motorsports session includes papers with analyses and investigations that cover the full range of aerodynamic topics from a computational point of view. Papers on numerical techniques, comparative studies, improved performance, race car design, and even a historical paper regarding the 1955 LeMans disaster are presented.

### Organizers:

Thomas N. Ramsay, Honda R&D Americas Inc.; Sandeep Dinkar Sovani, ANSYS Inc.; H. Robert (Bob) Welge, Robert's Engineering Development

## Improving the Cooling Airflow of an Open Wheeled Race Car

Lasse Christoffersen, Chalmers Univ. of Technology; David Söderblom, Chalmers Univ of Technology; Lennart Löfdahl, Chalmers

## Numerical Optimization of the Location of F1 CDG Wings

Jorge Barata, João Correia, André Silva, Univ. of Beira Interior

## The Role of Aerodynamics in the 1955 Le Mans Crash

Peter Gullberg, Lennart Löfdahl, Chalmers

## Experimental and CFD Comparative Case Studies of Aerodynamics of Race Car Wings, Underbodies with Wheels, and Motorcycle Flows.

Sachin Desai, Betty Chi Man Lo, Cornell Univ; Emily Leylek, Oren Breslouer, Cornell Univ.; Aleksandr Bychkovsky; Punith Doddegowda; Albert R. George, Cornell Univ.

## Facility Safety and Event Management

10:30 a.m.

Presentations cover the development of a trackside energy-attenuating barrier and Australian motor sport accident monitoring.

### Organizers:

John W. Melvin, Tandelata; J. Kirk Russell

## Development of a Barrier for Perpendicular High Speed Impact (Oral Only)

Hubert Gramling, FIA Institute

## Australian Motor Sport Crash Data Collection and Analysis.

Thomas Gibson, Human Impact Engineering; Michael Henderson, Self Employed; Christine Bethwaite, CQB Services Pty Ltd

## Green Motor Sports - Part 1

10:30 a.m.

The Green Motorsports session includes papers and oral presentations on the environmental issues the sport faces today with comments on the possible solutions. Topics include the use of alternative fuels, energy recovery, and energy governance as ways to improve both the dedicated racing fan's, as well as the general public's, perception of racing. How and why these technologies are transferred into mainstream transportation will also be explored.

### Organizers:

Tim Holland, Lotus Engineering Inc.

## The Road to the Green Challenge One Way to Make Racing Relevant By John Glenn, Environmental Specialist USEPA, and other members of the Green Racing Work Group (tbd) (Oral Only)

## The Application of Energy-Based Fuel Formulae to Increase the Efficiency Relevance and Reduce the CO2 Emissions of Motor Sport

James Turner, Richard Pearson, Lotus Engineering Ltd

## 'ADVANCED & FUTURE FUELS IN MOTORSPORT' (Oral Only)

Richard Karlstetter, Shell Global Solutions UK

## Optimisation of Hybrid Kinetic Energy Recovery Systems (KERS) for Different Racing Circuits

Douglas Cross, Flybrid Systems LLP

## Testing and Simulation - Chassis Part 2

10:30 a.m.

Simulation enables engineers to predict how a new design will perform by combining math-based methods with insight into to existing designs. Testing serves to confirm the behavior of the new design using physical hardware. Testing and simulation as two essential engineering methods for motorsports go hand in hand. This session discusses leading edge applications of testing and simulation as well as best practices for leveraging a combination of the two to achieve ever greater performance.

### Organizers:

Wensi Jin, The MathWorks Inc.; Edward M. Kasprzak, SUNY-Buffalo

## Application of System Identification for Efficient Suspension Tuning in High-Performance Vehicles: Quarter-Car Study

Chris Boggs, Steve Southward, Mehdi Ahmadian, Virginia Tech

## Comparison of the Performance of 7-Post and 8-Post Dynamic Shaker Rigs for Vehicle Dynamic Studies

Steve Southward, Chris Boggs, Virginia Tech

## Simulation with a Vertical Oscillating Race Car Model

Michael Graf, D.A.T.A.S., Ltd.; Steffen Kosuch, DATAS Ltd

**SESSIONS** TECHNICAL, BUSINESS & EXECUTIVE**The Science of Safety - Part 2**

10:30 a.m.

This sessions presentations cover research and development activities on a variety of safety related issues.

Organizers:

John W. Melvin, Tandelata; J. Kirk Russell

**Numerical Simulation of Hybrid III Response in an SAE Baja Vehicle in Frontal Impact Scenarios**

Kin Yuen, Univ of Waterloo; Christopher George Thom, Univ. of Waterloo; Duane Cronin, Univ of Waterloo

**Determination of the Pressure Distribution Beneath Two and Three Inch Wide Racing Safety Belts**

John W. Melvin, Tandelata

**Development of the MADYMO Race Car Driver Model for Frontal Impact Simulation and Thoracolumbar Spine Injury Prediction in Indianapolis-type Racing Car Drivers**

Tara Amenson, Motorsports Impact Biomechanics Consulting, LLC; Paul Begeman, Wayne State University; John Melvin, Tandelata, Inc.; Michele Grimm, Wayne State University

**Vertical Impact to an Open Wheel Racecar and Development of a Crash Test to Simulate the Driver Response**

James Chinni, Indiana Mills &amp; Mfg. Inc.; Jeff Horton, Indy Racing League; Terry Trammell, Orthopaedics Indianapolis

**Aerodynamics - Computational Methods and Modeling - Part 2**

2:00 p.m.

This motorsports session includes papers with analyses and investigations that cover the full range of aerodynamic topics from a computational point of view. Papers on numerical techniques, comparative studies, improved performance, race car design, and even a historical paper regarding the 1955 LeMans disaster are presented.

Organizers:

Thomas N. Ramsay, Honda R&amp;D Americas Inc.; Sandeep Dinkar Sovani, ANSYS Inc.; H. Robert (Bob) Welge, Robert's Engineering Development

**Development of New Turbulence Models and Computational Methods for Automotive Aerodynamics and Heat Transfer**

Scott Holloway, Clemson Univ.; Mary Holloway, James Leylek, Clemson Univ

**A Fast and Fully Automated Cartesian Meshing Solution for Dirty CAD Geometries**

Santosh Kini, Richard Thoms, Fanglin Zhu, ESI Group

**Design and CFD Analysis of an NHRA Funny Car Body**

Dan Engel, Kevin Golsch, General Motors Corp.; Mike Green, Don Prudhomme Racing; Ed Smith, Applied Technologies, Inc.; Cem Albukrek, Exa Corporation

**HPC-LES for the Prediction of Unsteady Aerodynamic Forces on a Vehicle in a Gusty Cross-flow Condition**

Makoto Tsubokura, Hokkaido Univ.; Takuji Nakashima, Takeshi Ikenaga, Hiroshima Univ.; Keiji Onishi, AdvanceSoft Corporation; Kozo Kitoh, Kozo Kitoh Technology; Nobuyuki Oshima, Hokkaido Univ.; Toshio Kobayashi, Univ. of Tokyo

**Green Motor Sports - Part 2**

2:00 p.m.

The Green Motorsports session includes papers and oral presentations on the environmental issues the sport faces today with comments on the possible solutions. Topics include the use of alternative fuels, energy recovery, and energy governance as ways to improve both the dedicated racing fan's, as well as the general public's, perception of racing. How and why these technologies are transferred into mainstream transportation will also be explored.

Organizers:

Tim Holland, Lotus Engineering Inc.

**A Selective Retrospective of Alternative Engines and Fuels in Motor Sports: You're Burning What? And How? (Oral Only)**

Dennis Simanaitis, Road &amp; Track Magazine

**The future of speed (Oral Only)**

Eric S. Wilson, Innovation MotorSports Development Group

**Cost Effective Sustainable Fuels for Performance Vehicles (Written Only -- No Oral Presentation)**

Kevin Dwyer

**Safety Focus Group Meeting**

2:00 p.m.

SAE is focused on providing leading edge technical information. This focus group will follow a process of open discussion, brainstorming and prioritization. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Moderators:

John Miller, SAE International

**Testing and Simulation - General Part 3**

2:00 p.m.

Simulation enables engineers to predict how a new design will perform by combining math-based methods with insight into to existing designs. Testing serves to confirm the behavior of the new design using physical hardware. Testing and simulation as two essential engineering methods for motorsports go hand in hand. This session discusses leading edge applications of testing and simulation as well as best practices for leveraging a combination of the two to achieve ever greater performance.

Organizers:

Wensi Jin, The MathWorks Inc.; Edward M. Kasprzak, SUNY-Buffalo

**Speed in Design Equals Speed at the Track (Oral Only)****Keeping Your Simulation Models from Changing Teams (Oral Only)**

Ethan Woodruff, The MathWorks Inc.; Brett Shoelson, Vinod Reddy, The MathWorks Inc

**Virtual Motorsports as a Vehicle Dynamics Teaching Tool**

Rob Rieveley, Bruce Minaker, University of Windsor

# SESSIONS

 TECHNICAL, BUSINESS & EXECUTIVE

## **Development of an Effective, Low-Cost Internet-Based Motorsport Driver Simulation**

David Kaemmer, Ian Berwick, iRacing.com Motorsport Simulations;  
Steve Potter, iRacing.com

## **Racing Simulation of a Formula 1 Vehicle with Kinetic Energy Recovery System**

Aldo Sorniotti, Univ. of Surrey

## **Application of the Optimal Maneuver Method for Enhancing Racing Motorcycle Performance**

Vittore Cossalter, Matteo Massaro, Simon Bobbo, Martino Peretto,  
University of Padova

---

## **Powertrain/Green Racing Focus Group Meeting**

3:00 p.m.

SAE is focused on providing leading edge technical information. This focus group will follow a process of open discussion, brainstorming and prioritization. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

### **Moderators:**

John Miller, SAE International

NOTE: This is a preliminary schedule. Session and session times subject to change without notice. For the most-up-to-date information visit [www.sae.org/msec](http://www.sae.org/msec)

### **Focus Group Meetings**

SAE International, the society dedicated to advancing mobility engineering worldwide, would like to invite you to participate in a focus group meeting designed to set the direction of SAE's motorsports technology offerings. SAE is focused on providing leading edge technical information in the form of technical papers, conferences, symposiums, seminars, standards, books and publications. This focus group will follow a process of open discussion, brainstorming, prioritization, definition and selection of leadership. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Please check Event-at-a-Glance or Session Listings for additional information topics, dates, and times.



# 2008 MOTORSPORTS CONFERENCE SPECIAL GUEST SPEAKERS

**TUESDAY, DECEMBER 2, 2008**

**8:00 – 9:00 A.M.**

**OPENING RECEPTION AND INDUSTRY KEYNOTE**



Keynote Speaker

**Peter Wright**  
*Technical Consultant,  
FIA Institute*

*Motorsports and the  
Environment:  
Challenge or Compromise*

Peter Wright has a long and distinguished career in the field of motor sport. In 1967, he became the aerodynamist and vehicle development engineer for the F1 team British Racing Motors (BRM). Later, he went to work for Specialised Mouldings Ltd., which designed and manufactured racing car bodies. As the General Manager of Technocraft, Mr. Wright was responsible for the F1

Team Lotus wind tunnel program and was instrumental in the development of the Lotus 79, the winner of 1978 Formula One World Championship.

As the director of Research and Development at Team Lotus, Mr. Wright was responsible for the development of many Lotus Formula One cars. Mr. Wright has served as Managing Director for Lotus Engineering, Director for Group Lotus and Technical Director of Team Lotus from 1991 to 1994.

Because of his extensive experience in motor sport, Mr. Wright was asked to be a technical adviser for the FIA in 1995 - a position he holds to this day. He currently works across a number of FIA affiliated organizations including Director of Euro NCAP and as an advisor on EU safety, emissions and traffic legislation. Mr. Wright was named an SAE Fellow in 2008.

**WEDNESDAY, DECEMBER 3, 2008**

**5:00 – 8:30 P.M.**

**RECEPTION AND BANQUET**



Banquet Speaker

**Bob Varsha**  
*Motorsports Industry  
Broadcast Journalist*

*Explaining Engineering To The  
Layman In Twenty Seconds  
Or Less - the Task of a Motor  
Sports TV Commentator*

A former world-class runner and corporate attorney, Mr. Varsha began his career with Turner Broadcasting covering a popular foot race in his home town.

Over four years at Turner Broadcasting Mr. Varsha hosted a WTBS public affairs program and served as a weekday sports anchor on CNN. In 1982 he joined the cast of the first weekly motorsports program on television, "MotorWeek Illustrated," airing on WTBS. Later he accepted a job with World Sports Enterprises

and began to cover motorsports full-time. Auto racing led him to ESPN. Mr. Varsha's assignments for ESPN and ABC Sports included a healthy portion of motorsports but not just motorsports.

Mr. Varsha's assignments for ESPN and ABC sports included major events like the World Alpine Championships, the Indianapolis 500 Time Trials, the U.S. Olympic Trials, and the New York City and Boston Marathons. For Outdoor Life he hosted the network's acclaimed first-ever live coverage of the greatest events in cycling, the Tour de France and the Giro d'Italia.

In late 2001 Mr. Varsha joined Speedvision when it relaunched as SPEED Channel. There he has continued his long association with Formula One and Le Mans and added new programs including the ground-breaking automotive history series "Behind the Headlights"; he also serves as the co-host of "Focus on Racing Radio", and serves as the Formula One correspondent for the program "Powershift" on XM Satellite Radio.

## CONFERENCE ORGANIZING COMMITTEE

### Conference General Chairperson

**Michael Royce**

*Albion Associates LLC*



Mr. Royce is a consultant with Albion Associates LLC. He retired from the DaimlerChrysler Corporation in June 2004 after almost 41 years within the Chrysler family. During his time with Chrysler, Mr. Royce held management positions including assignments in Truck Engineering, Product Planning, Engine Development and Powertrain Program Management.

Between 1992 and 1994 he was the Technical Director at Lamborghini Engineering in Italy, managing the Chrysler Lamborghini Formula 1 engine program. His last assignment was that of Senior Manager of Advanced Engine Technologies.

In 1999 Mr. Royce became a founding member of the DaimlerChrysler Automotive Engineers Program and

was on its organizing committee until his retirement. He has been a licensed SCCA scrutineer for many years working everything from local autocrosses to Formula 1.

Royce received Bachelors and Masters Degrees in Mechanical Sciences from Cambridge University, England, and Masters Degrees in Automotive Engineering from the Chrysler Institute of Engineering and in management from the University of Michigan-Dearborn.

Royce has been an active member of the SAE since 1965, and has served on the organizing committee of all eight SAE Motorsport Engineering Conferences. He has been actively involved in Formula SAE since 1986, has been a member of the Formula SAE Rules Committee since 1996, and its Chairman since 2000. He now also chairs the SAE's University Programs Committee. He was the recipient of the 2005 SAE Excellence in Engineering Education Award.

## CONFERENCE ORGANIZING COMMITTEE

**Lee Carducci**, President, Power-Tec Engineering

**Dr. Edward M. Kasprzak**, Associate, Vehicle Dynamicist, Milliken Research Associates, Inc.

**David Finch**, President, RAETECH Corp.

**Paul Haney**, Owner, InfoTire

**Tim Holland**, Director of Motorsports Initiatives, Lotus Engineering Inc.

**Wensi Jin**, Automotive Industry Manager, The MathWorks Inc.

**Wiley R. McCoy**, Director, Technical Advisory Board, McLaren Performance

**John Melvin**, President, Tandelta

**Thomas N. Ramsay**, Senior Engineer, Honda R&D Americas, Inc.

**J. Kirk Russell**

**Don Taylor**, Senior Technical Director, NHRA

**Jeremy Thoennes**, Technical Manager, SCCA

**H. Robert Welge**, Chief Engineer, Robert's Engineering Development



# REGISTRATION AND FEES

## REGISTERING IS EASY:

Web: [www.sae.org/msec](http://www.sae.org/msec)  
 Phone: 1-877-606-7323 or  
 1-724-776-4970 (outside the U.S. and Canada)  
 Fax: 1-724-776-0790  
 CustomerService@sae.org

## Maximum Savings!

Become an SAE Member  
 and pre-register by  
 November 14, 2008

Category	On or before November 14	After November 14
Member*	\$295	\$395
Non-member*	\$595	\$695
Presenting Author	\$149	\$149
Participant (includes organizers, chairs, moderators, authors and panelists)*	FREE	FREE
Media	FREE	FREE
Exhibitor Booth Personnel (limit 1 per booth)	FREE	FREE
SAE Student Member	FREE	FREE
Non-member Student	\$25	\$25

### Conditions of Sale

All cancellations must be in writing and received by SAE prior to November 14, 2008. A \$50 processing fee will be assessed for each cancelled registration that results in a refund. Refunds will not be issued if cancellation occurs on or after November 14. This policy includes special event and meal fees. For the SAE membership registration rates, member dues must be current at the start of the event. Children under 16 years of age are not permitted.



SAE will do what is feasible to make its events reasonably accessible to attendees. If you have special accommodation needs, please let us know in advance by calling 1-877-606-7323 (1-724-776-4970 outside U.S. and Canada). Accommodations requested on site will be provided only if possible for us to do so with short notice.

*Note: Registration fee includes technical sessions, breaks, exhibition and a copy of the event proceedings on CD-ROM.*

# HOTEL AND TRAVEL INFORMATION

## Embassy Suites Charlotte-Concord Golf Resort & Spa

5400 John Q. Hammons Drive NW  
 Concord, NC 28027

### Hotel Reservation

SAE's group rate is \$170 per single/double, per night, plus local, state and federal applicable taxes. A block of sleeping rooms has been reserved at the Embassy Suites Charlotte – Concord Golf Resort & Spa.

All attendees are responsible for their own lodging and travel arrangements.

Reservations must be made through The Housing Connection by November 14, 2008 by calling 888-221-9425.

# SAE Related Resources

2008 Motorsports Engineering Conference

For complete listing of products visit [store.sae.org](http://store.sae.org)  
Books • Standards • Web/CD • Papers • Training



**\$69.95**

## Hands-On Race Car Engineer

Author: John H. Glimmerveen

This book will help racing professionals and enthusiasts learn to recognize why they won or lost a race - key information to continually improving and reaching the winner's circle. It looks at every part of the process required to make a car better than its competitors.

Chapters include:

- Assembling the Car
- Testing, Practice and Qualifying
- Essential spares and equipment
- Geometrical Set-up
- Racing
- and more

ISBN: 978-0-7680-0898-2  
Paperbound; 2004

**SAE Member Price: \$55.96**

**Non-member Price: \$69.95**

**Product I.D. R-323**



**\$79.95**

## Analysis Techniques for Racecar Data Acquisition

Author: Jorge Segers

Data acquisition has become an invaluable tool for establishing racecar and car/driver performance. Now that the ability exists to analyze each and every performance parameter for car and driver, accurate use of this data can provide a key advantage on the racetrack. This book provides a thorough overview of the varied methods for analyzing racecar data acquisition system outputs, with a focus on vehicle dynamics.

Topics covered include:

- Data analysis software requirements
- Straight-line acceleration
- Braking, gearing, and cornering
- Quantifying roll stiffness distribution
- and much more!

ISBN: 978-0-7680-1655-0  
Hardbound; 2008

**SAE Member Price: \$63.96**

**Non-member Price: \$79.95**

**Product I.D. R-367**



**\$149.95**

## Race Car Vehicle Dynamics Book and Problems, Answers and Solutions Set

Authors: William F. Milliken; Douglas L. Milliken; Edward M. Kasprzak; L. Daniel Metz

Written for the engineer as well as the race car enthusiast, Race Car Vehicle Dynamics gives a comprehensive treatment of vehicle dynamics and its application in a racing environment. It is also widely used as a college textbook and has been an SAE best-seller since its introduction.

Race Car Vehicle Dynamics: Problems, Answers and Experiments is a supplement to Race Car Vehicle Dynamic and includes problems and solutions for every chapter of Race Car Vehicle Dynamics and has been specially developed for inclusion with this book. Purchase both the book and the workbook as a set and save!

ISBN: 978-0-7680-0121-8  
Hardbound, paperbound, CD-ROM - Shrink-wrapped

**SAE Member Price: \$119.96**

**Non-member Price: \$149.95**

**Product I.D. R-146.SET**

**(books can be sold separately)**

## SAE Seminars and e-Seminars

### Fundamentals of Aerodynamics Applied to Race Cars - I.D. C0515

### Race Engine Calibration for Optimal Performance - I.D. C0602

Also available as an e-Seminar! I.D. # PD130701

### High-Performance Brake Systems - I.D. C0718

### NEW! High Performance Engine Design and Development - I.D. C0725

### New! Fundamentals of Race Car Chassis Set-up - I.D. C0720

### Race Car Data Acquisition and Analysis - I.D. C0829

For information or to register for these or any SAE International Professional Development product visit: [mylearn.sae.org](http://mylearn.sae.org)

## Order today!

Online: [store.sae.org](http://store.sae.org)

E-mail: [CustomerService@sae.org](mailto:CustomerService@sae.org)

Phone: 1-877-606-7323 (U.S. & Canada)

or 1-724-776-4970

Note: prices subject to change. Actual shipping charges will be added.

**Save 20%!**

SAE **Members Only** save 20% on most SAE publications  
[www.sae.org/membership](http://www.sae.org/membership)

# MARKETING SOLUTIONS

## SPONSORSHIP MENU

### Tabletop Display **\$2,000 (USD)**

Includes:

- One table top display space – 6' x 30" table with two chairs
- One complimentary registration – includes lunch, refreshment breaks, evening reception and materials
- Recognition in the Event Program

### Conference Partner

Collaborate with SAE to distinguish your company at this conference. Choose one of the partner programs, an exclusive sponsorship or get creative with a customized package! Promote your company to top industry professionals and other attendees.

### **Checkered Flag PARTNER** **\$20,000 (USD)**

Includes: (limited to 2 companies)

- Table top display space
- Recognition as host of the Tuesday Evening Reception
- Complimentary registration for two (2) participants
- Display of logo on sponsor signage at the event
- Full page ad in Event Guide with company listing
- Recognition on the event sponsors page of the SAE website

### **Green Flag PARTNER** **\$15,000 (USD)**

Includes: (limited to 4 companies)

- Recognition as exclusive host of breakfast or lunch
- Complimentary registration for one (1) participant
- Display of logo on sponsor signage at the event
- Half page ad in Event Guide with company listing
- Recognition on the event sponsor page of the SAE website

### **White Flag PARTNER** **\$5,000 (USD)**

Includes: (limited to 5 companies)

- Recognition as exclusive host of one of the daily breaks
- Company logo on sponsor signage at the event
- Recognition in Event Guide
- Recognition on the event sponsors page of the SAE website

### **FRIENDS OF THE INDUSTRY** **\$1,000 (USD)**

Includes:

- Company logo on sponsor signage
- Recognition in the Event Guide
- Recognition on the event sponsors page of the SAE website

## White Flag Partner



## MARKETING SOLUTIONS – cont.

### Other Sponsorship Opportunities

#### **Lanyards \$5,000**

Touch every attendee and have him or her wear your company name for the duration of the event. Used long after the event, brand your company with the SAE Motorsports Engineering Conference.

#### **Week-at-a-glance Badge Insert \$5,000**

Display your company name and logo to all attendees. The week-at-a-glance shows a helpful summary of all scheduled events during the conference and fits in every attendee's badge holder with your company's name and logo showing for all to see.

#### **Conference Pens and Notepads \$6,000**

Provide each attendee with a pen and notepad to take valuable notes and contact information that is obtained throughout the conference. Have your corporate logo splashed on the notepads and pens that each attendee will use and keep.

### Advertising Opportunities

Available in both the *Event Guide* and *Automotive Engineering International* magazine with a global circulation of 87,718\* and distributed at this event. Advertising rates start at just \$3,490.

\*BPA audited circulation statement, June 2007

### Contact SAE Customer Sales & Support:

1-888-875-3976 (Toll-free, U.S. and Canada)

1-724-772-4086 (Outside U.S. and Canada)

1-724-776-3087 FAX

CustomerSales@sae.org

\* BPA statement for the six month period ending June 2007 (small text)

### Exhibitor list

Anvil Prototype & Design

Bodycote HIP

CAPE

CD-adapco

Dodge Motorsports Engineering

Clemson University

DS SolidWorks Corp.

Exa Corp.

iRacing.com Motorsport Simulations

Ozen Engineering Inc.

Raetech Corp.

The MathWorks Inc.

Windshear Inc.

P81706

**SAE** *International*<sup>™</sup>

400 Commonwealth Drive  
Warrendale, PA 15096-0001

Non-Profit Org.  
U.S. POSTAGE  
**PAID**  
Pittsburgh, Pa.  
Permit No. 1731

# 2008 SAE *Motorsports Engineering* Conference

**December 2-4, 2008**

The Embassy Suites Charlotte-Concord Golf Resort & Spa  
Concord, North Carolina, USA

**Keeping You Ahead –  
Racing Technologies YOU Need to Know**



**Pre-Register** by November 14, 2008  
SAE Members Save \$300 off of the  
full conference fee;  
Non-Members Save \$200

[www.sae.org/events/msec](http://www.sae.org/events/msec)