

# SAE 2009 Heavy Truck Handling, Dynamics & Control Symposium

May 5-7, 2009  
Clemson University - ICAR  
Greenville, South Carolina, USA

SAE Members SAVE \$400 off  
the full-conference fee\*

*\*requires pre-registration by April 17*

## Preliminary Agenda

[www.sae.org/truckhdc](http://www.sae.org/truckhdc)

Workshop May 4  
Ride and Demonstration May 7  
*see page 2 for details*





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May 5-7, 2009;

Clemson University - International Center for Automotive Research (CU-ICAR);  
Greenville, South Carolina, USA

Heavy duty trucks must share the road with passenger cars and everyone's safety is a concern. Advances in vehicle dynamics technology are increasing the control and handling of heavy trucks making them safer to operate and affecting the safety of other vehicles on the road; but growing road congestion and possible government regulation are becoming the principal influences in future vehicle design.

**Your knowledge of the solutions, tools and trends affecting heavy truck design is critical.**

**The SAE 2009 Heavy Truck Handling, Dynamics & Control Symposium** will examine various technologies related to heavy truck ride and handling dynamics and control, and their impacts on the heavy truck industry. It will explore technologies in the R & D pipeline, particularly those designed to provide an extra measure of safety for truck operators and the motoring public, including some military applications.

This symposium provides you with the opportunity to review and discuss the technology and prepares you to meet future government requirements and supply safer vehicles to the market.

## **The symposium includes:**

- Technical content featuring expert presentation
- Access to technology leaders with open and cooperative dialogue
- Networking opportunities that promote discussion, professional interaction and collaboration

Benefit from presentations of new strategies for vehicle handling, dynamics, safety and control; and interaction with colleagues from other OEMs and supplier companies, research facilities, government and academia.

## **Technology topics include:**

- New Stability and Safety Control Technologies
- Electronic Stability Controls (ESC)
- Components
- Rollover Prevention
- Collision Avoidance
- Vehicle Dynamics Simulation
- Testing & Measurement
- Government Regulations Related to Trucks

## **Organizing Committee:**

**Beshah Ayalew**, Assistant Professor, Clemson University - ICAR

**James Davidson**, Engineer, U.S. Army - TARDEC

**Suzanne Dickerson**, Manager, Marketing and Global Business Development, Clemson - ICAR

**Dr. David Hall**, Michelin

**Stefan Jansson**, Principal Engineer, Volvo Trucks North America

**Dr. Ragnar Ledesma**, Principal Engineer, ArvinMeritor Inc.

**Skip Yeakel**, Principal Engineer, Volvo

# EVENT AGENDA

Monday, May 4, 2009

- 10:00 a.m. **Early Bird & K & C Rig Workshop Registration** –  
(registration is at Michelin America's Research Corporation)
- 12:00 p.m. **K & C Rig Workshop** – Michelin America's Research Corporation

Tuesday, May 5, 2009

- 7:00 a.m. Registration
- 8:00 a.m. Opening Remarks – **John Miller, SAE International**
- 8:30 a.m. Keynote Address

## **Electronic Stability Control**

- 9:15 a.m. *Development of Nash Optimal Strategy for Tractor-Trailer Stability Control System* – **Saied Taheri Ph.D., Virginia Polytechnic**
- 10:00 a.m. Networking Break – Tabletop Exhibits Open
- 10:30 a.m. *Tractor and ESC Co-Simulation and Investigation of Adaptive Stability Control Approaches* – **John Limroth, CU-ICAR – Clemson University, International Center for Automotive Research**
- 11:15 a.m. *High Speed Electronic Stability Control System Demonstration on a Urban Autonomous Ground Vehicle* – **Bapiraju Surampudi Ph.D., Southwest Research Institute**
- 12:00 p.m. Networking Lunch – Tabletop Exhibits Open

## **Components**

- 1:30 p.m. *Articulated Dump Truck Independent Suspension* – **Eanna P. Timoney, Timoney Research Ltd.**
- 2:15 p.m. *Artificial Steering Feel on Commercial Vehicles* – **Daniel Williams, TRW Commercial Steering**
- 3:00 p.m. Networking Break – Tabletop Exhibits Open

## **Safety/Testing**

- 3:30 p.m. *Steering Wheel Haptic Feedback System for Indication and Rollover Avoidance in a Heavy Commercial Vehicle* – **Peter Tkacik, University of North Carolina - Charlotte**
- 4:15 p.m. *Presentation of the Results from and Extended Pilot Study of an Integrated Vehicle-Based Safety System for Heavy Trucks* – **Scott E. Bogard, University of Michigan**
- 5:00 p.m. Networking Reception

Wednesday, May 6, 2009

- 7:00 a.m. Registration
- 8:00 a.m. Opening Remarks – **John Miller, SAE International**

## **Safety/Testing – continued**

- 8:30 a.m. *Real-Time Heavy Truck Rollover Warning System* – **Peter Tkacik, University of North Carolina - Charlotte**
- 9:15 a.m. *Objective Handling Evaluation of Heavy Trucks by means of Model Based Parameter Identification* – **Dr. Klaus Prenninger, Magna Powertrain**
- 10:00 a.m. Networking Break – Tabletop Exhibits Open



## EVENT AGENDA (CONT'D.)

- 10:30 a.m. *Heavy Truck Measurement, Modeling and Evaluation* – **Michael Arant, Michelin**  
11:15 a.m. *Verification of Heavy Truck Chassis Control Embedded Software* – **Josh Isser, ETAS**  
12:00 p.m. Networking Lunch – Tabletop Exhibits Open

### **Simulation/Modeling**

- 1:30 p.m. *Development and Validation of a Hardware in the Loop Simulation for Studying Heavy Truck Stability Control Effectiveness* – **Alrik L. Svenson, National Highway Traffic Safety Administration**  
2:15 p.m. *Robust Vehicle Dynamics Simulation using Neural Network Response Surface Generation* – **Peter D. Schmitt, Frederic Jacquelin and David Martin, Ricardo, Inc.**  
3:00 p.m. Networking Break – Tabletop Exhibits Open  
3:30 p.m. *Simulation Applications in the Development and Testing of Heavy Vehicles* – **Dr. Thomas D. Gillespie, Mechanical Simulations Corporation**  
4:15 p.m. *Tire Model Investigation in Longitudinal Direction using the Magic Formula* – **Dr-Ing Sameh Maher Metwalley, Helwan University**  
5:00 p.m. Networking Reception

Thursday, May 7, 2009

- 7:00 a.m. Michelin Proving Grounds Ride and Demonstration Registration  
9:00 a.m. **Michelin Proving Grounds Ride and Demonstration** – Michelin America's Research Corporation

## ADDITIONAL EVENTS

### **Use of Kinematics and Compliance Measurement for Simulation of Heavy Truck Vehicle Dynamics (K & C Workshop)**

**Monday, May 4, 2009; 12:00 – 5:00 p.m.**  
**Michelin Americas Research Corporation**

This is a half-day workshop on kinematics and compliance testing, results and use of data for heavy truck vehicle dynamics analysis.

### **The Michelin Proving Grounds Ride & Demonstration and Facility Tour**

**Thursday, May 7, 2009; 9:00 a.m. – 4:00 p.m.**  
**Michelin Americas Research Corporation**

Attendees are invited to participate in a heavy truck vehicle dynamics Ride and Demonstration at the Michelin Americas Research Corporation Proving Grounds.

Additional fees are required to participate in these events. You must also be a registered attendee of the **SAE 2009 Heavy Truck Handling, Dynamics & Control Symposium** to participate.

**Please visit [www.sae.org/truckhdc](http://www.sae.org/truckhdc) for additional information.**

# REGISTRATION AND HOTEL INFORMATION

| Category   | By<br>4/17/09 | After<br>4/17/09<br>and ON SITE |
|--|---------------|---------------------------------|
| SAE Member   | \$695         | \$795                           |
| Non-Member*  | \$995         | \$1,095                         |
| Participant<br>(includes organizers, presenter)        | FREE          | FREE                            |
| Exhibitor Booth Personnel<br>(Limit 1 per booth)       | FREE          | FREE                            |
| K & C Rig Workshop –<br>May 4, 2009; 12:00 – 4:00 p.m. | \$75          | \$75                            |
| Ride & Demonstration Event –<br>Thursday, May 7, 2009  | \$125         | \$125                           |

**Conditions of Sale** - All cancellations must be in writing and received by SAE prior to April 17, 2009. 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 April 17, 2009. 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 on short notice.

\* Includes one year of SAE membership.

**Event Registration Includes:** Breakfasts, a.m. Break, p.m. Break, Lunches, Technical Presentations & Exhibit

## Registration Hours

K & C Workshop  
Monday May 4, 2009 10:00 a.m. – 12:00 p.m.  
(registration at Michelin Americas Research Corporation)

Early Bird  
Monday May 4, 2009 10:00 a.m. – 12:00 p.m.  
(registration at Michelin Americas Research Corporation)

Tuesday May 5, 2009 7:00 a.m. – 5:00 p.m.

Wednesday May 6, 2009 7:00 a.m. – 5:00 p.m.

Thursday May 7, 2009 7:00 a.m. – 1:00 p.m.

## Exhibit Hours

Tuesday May 5, 2009  
10:00 – 10:30 a.m.  
12:30 – 1:30 p.m.

Wednesday May 6, 2009  
10:00 – 10:30 a.m.  
12:30 – 1:30 p.m.

## Hotel Information

- All attendees are responsible for arranging their own lodging and travel.
- A block of rooms has been reserved at the following hotels.
- Please see listing for SAE's group rate; all rates are per room per night and are all inclusive plus applicable taxes.
- Reservations should be made through the hotel; please ask for the Clemson-ICAR rate.

### Recommended Hotels

Embassy Suites Greenville Golf Resort & Conference Center  
670 Verdae Boulevard  
Greenville, SC 29607  
Phone: (864) 676-9090  
<http://www.embassysuitesgreenville.com/>  
2009 CU-ICAR rate - \$109/night

Staybridge Suites  
31 Market Point Drive  
Greenville, SC 29607  
Phone: (864) 288-4448  
<http://ichotelsgroup.com/h/d/sb/1/en/hotel/GSPSC/welcome>  
2009 CU-ICAR rate - \$85/night

Please see the Hotel and Travel link at the Symposium main page for additional information on travel [www.sae.org/truckhdc](http://www.sae.org/truckhdc)



# MARKETING SOLUTIONS

## **Tabletop Display Information: \$2,200 (USD)**

Includes:

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

**Symposium Partner** – Collaborate with SAE to distinguish your company at this symposium. 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.

## **GOLD Partner - \$10,000 (USD)**

(limited to one company)

Includes:

- Table top display space
- Recognition as the EXCLUSIVE host of the Welcome Reception
- Complimentary registration for three (3) symposium participants
- Display of logo on sponsor signage at the event
- Recognition in symposium Event Guide
- Recognition on the event sponsors page of the SAE website

## **SILVER Partner - \$6,500 (USD)**

(limited to 3 companies)

Includes:

- Recognition as exclusive host of one of the daily lunches
- Complimentary registration for two (2) symposium participants
- Display of logo on sponsor signage at the event
- Recognition in the symposium Event Guide
- Recognition on the event sponsor page of the SAE website

## **BRONZE Partner - \$4,500 (USD)**

(limited to 6 companies)

Includes:

- Recognition as exclusive host of one of the daily breaks (refreshments provided)
- Complimentary registration for one (1) symposium participant
- Company logo on sponsor signage at the event
- Recognition in the symposium Event Guide
- Recognition on the event sponsors page of the SAE website

## **FRIEND OF THE INDUSTRY - \$1,500 (USD)**

Includes:

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

### **FOR MORE INFORMATION CONTACT:**

**Gretchen Chamberlain**

Toll free: 1-888-875-3976 (US and Canada)  
1-724-772-7591 (outside US and Canada)

Email: [gchamberlain@sae.org](mailto:gchamberlain@sae.org)

## RELATED RESOURCES FROM SAE

### Ground Vehicle Standards on CD-ROM

Locate the ground vehicle standards you need with *SAE Ground Vehicle Standards* on CD-ROM, which contains over 1,800 individual standards, recommended practices, and information reports pertaining to passenger cars, trucks, motorcycles, trailers, snowmobiles, agricultural tractors, and more. Includes **J-1939** and related documents. Plus, this CD is updated quarterly for one year so you will receive new, revised and cancelled standards regularly.

**Member & Non-Member Price: \$2,040, Product ID: CDGV-2009**

### Advancements in Steering Systems; Braking Systems; and Advanced Chassis Control and Rollover Stability

This publication contains 12 papers that address new developments in commercial vehicle steering such as auxiliary axle and computer controlled systems, as well as studies on regenerative brake systems and a new modeling technique that examines brake configuration packages for reducing stopping distances. It also includes new information on advanced control systems for enhancing stability and safety in road vehicles, and its effect on suspension kinematic characteristics.

**Member Price: \$59.96; Non-Member Price: \$74.95, Product Code: SP-2216**

### Individual Papers

SAE technical papers contain a wealth of vehicle information presented by your peers at SAE Conferences. For a complete listing of Heavy Truck Handling, Dynamics & Control papers visit [www.sae.org/technical/papers](http://www.sae.org/technical/papers)

### SAE Seminars and e-Seminars

**NEW! Fundamentals of Heavy Truck Dynamics** – also available as an on-site seminar  
**Product #: C0837; SAE Members: \$1,225; Non-members: \$1,355**

#### Applied Brake Controls: ABS, TCS, and ESC

**Product #: C0610; SAE Members: \$1,725; Non-members: \$1,850**

**Commercial Vehicle Braking Systems** – also available as an e-Seminar (product #PD130611)

**Product #: C0233; SAE Members: \$1,265; Non-members: \$1,395**

### Order today!

Online: [www.sae.org](http://www.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.*

SAE Members SAVE 20% on most SAE publications, products and meetings. Visit [www.sae.org/membership](http://www.sae.org/membership)



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