

### This event will include:

- An overview of vehicle dynamics theory
- Tyres, suspensions, brakes and steering systems
- Unit truck, articulated vehicle and driver modelling
- Ride, rollover, handling and braking
- Hand-on exercises in vehicle simulation
- Instrumentation and field-testing of heavy vehicles
- Lab tour and demonstration of the CVDC experimental vehicles.

### Course Costs

The event fee is £1500 (incl. VAT). This includes a copy of the comprehensive course manual, which covers all aspects of heavy vehicle dynamics, the course dinner on the night of Tuesday 8th July and barbeque in the evening of Wednesday 9th July. **'Early Bird' Registrations before 1st June will receive a £100 'Early Bird Discount'.**

Accommodation is not included in the course costs but special rates for course members have been negotiated with Queens' College Cambridge and local hotels in Cambridge City Centre. Rooms are available from £35 per person, per night. Further information about accommodation and registration details can be found on the course web site:

<http://www-cvdc.eng.cam.ac.uk/Truck-Course-2014>

# MECHANICS OF HEAVY-DUTY TRUCK SYSTEMS



**A four day professional development course, led by**

Chris Winkler, Steve Karimihas, Tom Gillseppe

University of Michigan Transportation

& Leon Henderson

Cambridge University Engineering Department

7<sup>th</sup> – 10<sup>th</sup> July, 2014

£100  
**'Early Bird'  
Discount!**

**The Cambridge Vehicle Dynamics Consortium (CVDC)** is pleased to present a four-day event focussed on the dynamics of heavy goods vehicles. The event will include the definitive UMTRI course on heavy truck dynamics as well as hardware and software demonstrations and hands-on exercises.

The heavy truck is a complex mechanical system, requiring its own modelling techniques, analysis programs, parameter measurement methods and test procedures. These will all be discussed during the event. Attendees will also have the opportunity to tour the Cambridge laboratories: see the start of the Cambridge – London leg of the Tour de France cycle race and field demonstrations of computer-controlled experimental vehicles.

## The Instructors

**Chris Winkler** is a Research Scientist Emeritus at the University of Michigan Transportation Research Institute (UMTRI). Chris has been involved in research into the dynamic behaviour of heavy-duty trucks throughout his more than 40 year career at in the Engineering Research Division at UMTRI. Chris has been the chairman of the Vehicle Dynamics Standards Committee of SAE and a US delegate to the Vehicle Dynamics and Road Holding committee of ISO.

**Thomas D. Gillespie**, Ph.D., is a research scientist and professor who has earned an international leadership position in the fields of vehicle dynamics engineering and transportation policy and safety, and who co-founded Mechanical Simulation Corporation in 1996. He authored the textbook "Fundamentals of Vehicle Dynamics," which is considered required reading for all vehicle dynamics engineers. He is frequently called upon to teach vehicle dynamics to engineers at many of the world's automotive manufacturing companies. His expertise has also thrust him into many unique, critical roles around the world.

**Steve Karamihas**, a senior research associate in UMTRI's Engineering Systems Group, has dealt primarily with the interaction of vehicles and roads and road surface roughness measurement. He also operated the heavy vehicle suspension-parameter-measurement facility at UMTRI, where he has tested over 160 heavy vehicle suspensions. In addition, he has analyzed data from on-road heavy-vehicle ride tests and laboratory heavy-vehicle tilt-table tests. He is the current chair of the Vehicle Dynamics Standards Committee and the Vehicle Performance Steering Committee of SAE. He earned bachelor's and master's degrees in mechanical engineering from the University of Michigan.

**Leon Henderson** recently completed his Ph.D. in the area of Heavy Vehicle Braking Systems at the University of Cambridge. Leon's work to date has focused on the development of a novel pneumatic actuator that can be used in Heavy Vehicle Anti-Lock Braking Systems (ABS) to improve brake pressure control and reduce stopping distances; as part of this project Leon worked closely with Haldex Brake Products to carry out comparative straight-line braking trials on a test vehicle. Leon has presented his work at several industrial and academic international conferences and is now a Research Associate with the Cambridge Vehicle Dynamics Consortium.

## Who Should Attend?

In addition to engineers involved in vehicle dynamics, this event is intended for persons engaged in technical activities such as truck design, truck equipment selection, fleet safety operations, accident reconstruction, development of truck safety standards and highway/truck interactions.

## Prerequisites

- Bachelor's degree in engineering or the equivalent background.
- Some experience or training in analysis or measurement of braking, steering or ride behaviour of cars or trucks.
- A familiarisation with the means for simulating vehicle system behaviour using computers is not necessary, but is helpful.

