

**BENEFIT FROM 2 CONFERENCES IN 1 EVENT!**

# AUTOMOTIVE AERODYNAMICS & THERMAL MANAGEMENT

INTERNATIONAL FORUM

24-25 September 2020, Virtual conference



Organized by **interNéct**

With featured experts, among others, from:



**BENTLEY**



The Power of Dreams



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## Testimonials from our past Forums:

"Highest rate of new contact development that I have ever experienced."

Dana Nicgorski, Robert Bosch LLC

"The most interesting Forum that I visited"

Dmitrii Fedotov, FSUE NAMI

"Bringing the aero & thermal communities together has driven valuable efficient discussions. The high focus on networking results in getting the maximum out of the event"

Wilko Jansen, Jaguar Land Rover

"All of the important people in this business are there. It was a brilliant experience and a great chance to share your knowledge"

Jan Jagrik, Skoda Auto

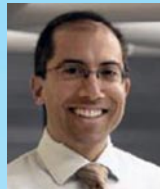
## Scientific Committee & Keynote Speakers:

Aerodynamics Sessions:



**Takashi Takiguchi**

Head of Aerodynamics, Thermal Management & Acceleration Performance, Honda Motor Co., Ltd., Japan



**Dr. Moni Islam**

Head of Aerodynamics Audi AG, Germany



**Craig Rowberry**

Functional Manager - Aerodynamics Bentley Motors Limited, UK



**Adrian Gaylard**

Technical Specialist - Computational Aerodynamics Jaguar Land Rover, UK

Thermal Management Sessions:



**Wilko Jansen**

Senior Technical Specialist TASE & AWCV, Jaguar Land Rover, UK



**Alfred Jeckel**

Manager Thermal Validation Li Ion Batteries Daimler AG, Germany



**Dr. Kamel Azzou**

Head of Advanced Engineering Valeo, France

## Join our sessions to hear about the latest case studies on:

- ▶ Powertrain thermal management for internal combustion engines, electric and hybrid - electric vehicles
- ▶ Vehicle thermodynamics
- ▶ Next generation fuel cell vehicle development
- ▶ HVAC and climate control solutions for optimized range, passenger comfort and environmental sustainability
- ▶ Thermal management of power electronics
- ▶ Virtual drive cycle thermal modelling & new development in CAE techniques
- ▶ Climate control for low refrigerant charge protection
- ▶ Next generation thermal management systems and components & integrated thermal management
- ▶ High voltage battery thermal management for enhanced energy efficiency and battery cooling
- ▶ Advanced designs in automotive climate control and cooling systems & waste heat recovery applications
- ▶ Aerodynamic design and optimization processes for handling and stability
- ▶ WLTP and aerodynamics, as well as future CO<sub>2</sub> compliance testing for aerodynamics solutions
- ▶ Aero-thermal development & efficiency
- ▶ Aeroacoustics and fuel economy
- ▶ Aerodynamic flow control and drag reduction
- ▶ Advanced CFD and wind tunnel testing
- ▶ CFD optimization algorithms
- ▶ (WLTP) Worldwide Harmonized Light Vehicles Test Procedures & Aerodynamics
- ▶ Motorsport aerodynamics and aerodynamic development transfer between motorsport and production industries
- ▶ Aerodynamic design for dirt contamination and water flow

...Among a variety of many other Automotive Aerodynamics & Thermal Management - related topics!

To Register: **T**+1 604 726 5530 | **E**info@internect.ca

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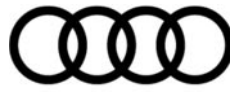
AGENDA | SEPTEMBER 2020

## FEATURED EXPERTS:



**Adrian Gaylard**

Technical Specialist - Computational Aerodynamics  
*Jaguar Land Rover, UK*



**Audi**

**Dr. Moni Islam**

Head of Aerodynamics  
*Audi AG, Germany*



**BENTLEY**

**Craig Rowberry**

Functional Manager - Aerodynamics  
*Bentley Motors Limited, UK*



DAIMLER

**Alfred Jeckel**

Battery Integration  
*Daimler AG, Germany*



**Wilko Jansen**

Senior Technical Specialist TASE & AWCV  
*Jaguar Land Rover, UK*



**HONDA**  
The Power of Dreams

**Takashi Takiguchi**

Chief Engineer of Cooling & Heat Resistance  
*Honda Motor Co., Ltd., Japan*



**HONDA**  
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**Shinsuke Nakamura**

Assistant Chief Engineer  
*Honda R&D Co., Ltd., Japan*



**Valeo**

**Dr. Kamel Azzouz**

Head of Advanced Engineering  
*Valeo, France*



**Andreas Schmitt**

Lead Engineer Aerodynamics  
*Lotus Cars, UK*



**Vikrant Aute**

Research Scientist & Co-Director  
Center for Environmental Engineering  
*University of Maryland, USA*



**Loughborough University**

**Jeff Howell**

Visiting Research Fellow  
*Loughborough University, UK*



**SAUBER Aerodynamics**

**Willem Toet**

Professor & Senior Sales Manager  
*University of Bolton & Sauber Aerodynamics, UK*

**Sponsorship Opportunities:**

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# VIRTUAL CONFERENCE PROGRAMME

Forum Day One / Thursday, 24 September 2020

(Note: The programme references UK time)

## 8:00-8:10 Welcome & Opening Speech by the Organiser



**Maria Nikolopoulou**  
Managing Director  
Internect Forums Limited, Canada

## 8:10-8:20 Keynote Speech [Session Chaired by Alfred Jeckel]



**Alfred Jeckel**  
Manager Thermal Validation Li Ion Batteries  
Daimler AG, Germany

## 8:20-8:50 Snow Ingress Prediction Method for Air Intake Duct



**Takashi Takiguchi**  
Head of Aerodynamics, Thermal Management & Acceleration Performance  
Honda R&D Co., Ltd., Japan

- ▶ Intake snow ingress causes engine power save
- ▶ Snow accumulation prediction method by LES and discrete phase model
- ▶ Flow pattern was measured by PIV
- ▶ Snow particle behavior is predicted by flow calculation, tracking property and on the wall behavior

## 8:50-9:20 New 5-Belt Rolling Road Aero-Acoustics Wind Tunnel at Honda R&D Automobile Center in Tochigi, Japan



**Shinsuke Nakamura**  
Assistant Chief Engineer, Honda R&D Co., Ltd., Japan

- ▶ Background of building yet another rolling road wind tunnel
- ▶ Basic features and specification
- ▶ Unique feature at Honda
- ▶ Final acceptance data
- ▶ Reference vehicles correlation between single belt wind tunnel
- ▶ On-going correlation between track coast down

## 9:20-9:50 The Effect of Wind Speed and Direction on the Aerodynamic Characteristics of Passenger Cars



**Jeff Howell**  
Visiting Professor, Loughborough University, UK

- ▶ Basis aerodynamic characteristics
- ▶ Effect of wind and vehicle speed and direction
- ▶ Aerodynamic targets
- ▶ Are conventional metrics adequate?

## 9:50-10:20 Break

## 10:20-10:30 Keynote Speech [Session Chaired by Adrian Gaylard]



**Adrian Gaylard**  
Technical Specialist - Computational Aerodynamics  
Jaguar Land Rover, UK

## 10:30-11:00 2019/2020 F1 – The cars, the changes



**Willem Toet**  
Professor & Senior Sales Manager  
University of Bolton & Sauber Aerodynamics

- ▶ For 2019 the FIA introduced some changes aimed at improving racing with the expectation downgraded to holding back the tide of worsening aero impact on following cars
- ▶ Teams hit the tracks with aero packages already beyond 2018 performance levels despite the apparent restrictions – why and how?
- ▶ Two different aerodynamic philosophies were followed – was there a “best” way? A small evolution of rules for 2020 was unlikely to cause major performance ripples but the cars do show some convergence of thinking
- ▶ The 2020 rules will carry over into 2021 with the new generation of lower aero interaction cars delayed until at least 2022 –but budget caps do come in– how will that influence the teams?

## 11:00-11:30 Battery Thermal Management: Retrospective and Futurespective Techniques



**Dr. Kamel Azzouz**  
Head of Advanced Engineering  
Valeo, France

- ▶ Battery thermal management market drivers
- ▶ Technological constraints
- ▶ Analysis of the improvement potential of battery performance
- ▶ Future outlook

## 11:30-12:00 Panel Discussion: Integrating Physical and Numerical Simulation: Opportunities & Challenges



**Adrian Gaylard**  
Technical Specialist -  
Computational Aerodynamics  
Jaguar Land Rover, UK

- ▶ How should we balance the use of numerical and physical methods?
- ▶ Reconciling differences: what happens when calculation and test disagree?
- ▶ Coping with incommensurability: what happens when the same units of measure are not available in the physical and numerical worlds?

## 12:00-12:15 Break

## 12:15-12:45 Interactive Session / Panel Discussion: Effective Coupling of Aerodynamics and Thermal Management in the Underhood

Chaired by our Scientific Committee:



**Takashi Takiguchi**  
Chief Engineer of Cooling & Heat Resistance,  
Honda Motor Co., Ltd.,  
Japan



**Alfred Jeckel**  
Manager Thermal Validation Li Ion Batteries  
Daimler AG, Germany



**Dr. Kamel Azzouz**  
Head of Advanced Engineering  
Valeo, France

- ▶ Whole vehicle development: Effective interaction of aerodynamics & thermal management
- ▶ Addressing thermal demands of underbody components without compromising on aerodynamics
- ▶ CFD as an enabler of underbody thermal management
- ▶ Underhood aerodynamics challenges and effective temperature distribution at various road inclinations
- ▶ Cooling air flow and the minimization of the proportion of the overall air resistance with aerodynamics & thermal development
- ▶ Successful aerodynamic design for cooling of brakes and fluids
- ▶ Size, position and design of cooling air intakes, air ducts and radiators to reduce wind resistance

## 12:45-12:50 Closing Remarks by the Organiser & End of Virtual Conference Day 1



**Maria Nikolopoulou**  
Managing Director  
Internect Forums Limited, Canada

# Forum Day Two/ Friday, 25 September 2020

(Note: The programme references UK time)

## 8:00-8:10 Welcome & Opening Speech by the Organiser



**Maria Nikolopoulou**  
Managing Director  
Internect Forums Limited, Canada

## 8:10-8:20 Keynote Speech [Session Chaired by Takashi Takiguchi]



**Takashi Takiguchi**  
Head of Aerodynamics, Thermal Management & Acceleration Performance  
Honda Motor Co., Ltd., Japan

## 8:20-8:50 Innovations in Air-to-Refrigerant Heat Exchangers



**Vikrant Aute**  
Research Scientist & Co-Director  
Center for Environmental Engineering  
University of Maryland, USA

- ▶ Opportunities for improving air-to-refrigerant heat exchangers
- ▶ Prototype development with additive manufacturing
- ▶ Comparison with heat exchangers manufactured using conventional technology at significantly lower cost
- ▶ Flow distribution and wetting
- ▶ Potential for shape-conforming heat exchangers in automotive systems

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## 8:50-9:00 ICON presentation

## 9:00-9:30 The Effect of Wheel Rim Porosity on a Sports Car's Aerodynamic and Brake Performance



**Andreas Schmitt**  
Lead Engineer Aerodynamics  
Lotus Cars, UK

- ▶ Assessment of the effect of rim porosity on brake temperature by means of track-based tests
- ▶ Wind tunnel investigations into rim porosity influence on lift and drag
- ▶ The influence of forced ventilation on aerodynamic properties
- ▶ Balancing aerodynamic, brake cooling and styling demands

## 9:30-9:45 Break

9:45-10:15 **Interactive Session - Team Debate with Q&As**  
*In small groups you will have the chance to share your views in a lively debate while solving a technical question.*

## 10:15-10:25 Keynote Speech [Session Chaired by Kamel Azzouz]



**Dr. Kamel Azzouz**  
Head of Advanced Engineering  
Valeo, France

## 10:25-10:55 Low Temperature Characteristics of Electric Powertrains and Thermal Management Solutions



**Alfred Jeckel**  
Manager Thermal Validation Li Ion Batteries  
Daimler AG, Germany

- ▶ Low temperature characteristics of BEV and PHEV
- ▶ Li Ion battery low temperature behavior in detail
- ▶ Thermal management possibilities to control temperature
- ▶ Outlook

## 10:55-11:10 Break

## 11:10-11:40 Design & Development on the Tightest Budget



**Willem Toet**  
Professor & Senior Sales Manager  
University of Bolton & Sauber Aerodynamics

- ▶ In F1, teams have been able to take advantage of increasing budgets, and have got used to expensive, effective but financially inefficient research methods
- ▶ In lesser formulae and the automotive sector, budgets were always tighter, and some interesting lessons can be drawn from these experiences – but still one can be more efficient with research
- ▶ Willem will share the “warts and all” experience of the development of an all-new hillclimb car with a development cost lower than the price of a mid-range road car
- ▶ Some fascinating advantages of a small cooperative team with diverse knowledge bases were demonstrated – and the pitfalls of holes in knowledge exposed
- ▶ The car has been built in small numbers and its strengths as well as its weaknesses can be seen on track
- ▶ Willem will talk through the lessons taken away from this process

## 11:40-12:10 Interactive Session / Panel Discussion: The Automotive Engineering Future After Coronavirus

Chaired by our Scientific Committee:



**Adrian Gaylard**  
Technical Specialist -  
Computational Aerodynamics  
Jaguar Land Rover, UK



**Alfred Jeckel**  
Manager Thermal Validation  
Li Ion Batteries  
Daimler AG, Germany



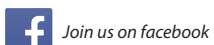
**Dr. Kamel Azzouz**  
Head of Advanced Engineering  
Valeo, France

- ▶ Effective remote working from personal experience
- ▶ Is CAE and virtual prototyping more necessary than ever?
- ▶ New platforms for effective sales and marketing for suppliers
- ▶ The future of the Automotive industry

## 12:10-12:20 Closing Remarks by the Organiser



**Maria Nikolopoulou**  
Managing Director  
Internect Limited, UK



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\*All Prices are in GBP (Great Britain Pound Sterling)

### Delegate Details:

Title:  Mr  Mrs  Dr  Prof

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Job Title: \_\_\_\_\_ Department: \_\_\_\_\_

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