

Editorial

DVN Munich Workshop: Gearing Up For Success

The holiday festivities are all done, and now it's back to challenges, opportunities and tasks in the new year. Here at DVN, we're putting finishing touches on the DVN Workshop to be held the 28th-29th of this month in Munich, at the marvelous and convenient Hilton Munich Airport hotel. In this week's Driving Vision News you'll find the program; here's an overview of what's in store for you as an attendee:

- High-level presentations by acclaimed international high-level experts (see the docket in this Newsletter)
- Exhibition booths from set makers, light source makers and tier-2 suppliers, showing their latest innovations
- A panel session on regulations, focussing on the most important points about the new lighting functions concerning 360° view.

All of this on a backdrop of the unparalleled networking opportunities DVN Workshops are known for. In a time of great upheaval in the automotive industry, with big new investments in EV and AV technology putting a squeeze on funding for innovative lighting—not to mention complicated regulatory situations—it is essential to get and stay right up to date with all the latest information about automakers and their suppliers, new technologies, and benchmarks to optimise what investments there might be in lighting.

Car interiors will become of central importance with the arrival of AV technology and new car usages. Give a look on DVN new Interior Newsletter and [the 2019 car interior overview following this link](#). For more information about DVN-I subscription for DVN members, contact : philippe.aumont@dvn-i.com

Please don't forget to send in your response to GTB President Geoff Draper's survey, **before 13 January**. Your responses are crucial to the session he will chair on regulations for new lighting functions at the Munich workshop. In case you missed the survey last week in the middle of the holidays, we're reprinting it this week.

Onward and upward in 2020, DVN's 12th year of operation! Sincerely yours



DVN President

In Depth Lighting Technology

Soon at Munich: The 20th DVN Workshop

Twice a year, we put on a DVN Workshop dedicated to vehicle lighting. Every Workshop smashes the attendance record set by the previous one, and we're edging up to around 350 attendees.



DVN WORKSHOP № 19: SHANGHAI, CHINA



DVN WORKSHOP № 18: MICHIGAN, USA

The first DVN Workshop of 2020 will be held in Munich on 28–29 January. It will start off with a keynote on the future of mobility by Carl van de Weijer, TU Eindhoven's Director of Smart Mobility. The rest of the two-day event will be filled with six presentation sessions, a panel discussion, expo booths, and networking time. Here's the docket:

Session 1 focusses on digital lighting activities of premium car makers:

Wolfgang Huhn (Audi, General Manager Lighting & Vision)
"Digital Light for Digital Cars"

Joerg Kaelble (BMW, General Manager Lighting & Visibility Systems)
"New Generation BMW Laser Light"

Shammika Wickramasinghe (JLR, Body Engineering Group Leader & Domain Architect)
"Lighting Communication"

Paul-Henri Matha (Volvo, Exterior Lighting Technical Leader)"Customer Knowledge— Volvo Approach"

Session 2 centres on adaptive lighting activities at generalist car makers:

Frank Heitplatz (Ford, Product Development Manager Global Core Restraints
"Ford's View on Adaptive Headlamp Technology Evolution"

Whilk Gonçalves (PSA, Lighting & Signalisation Expert)
"PSA Group Strategy for ADB Headlamps"

Francois Bedu (Renault, Lighting Innovation Pilot)
"After Full LED Headlamps For All, How ADB System can be Adressed to Mainstream Market by a General Carmaker?"

Ingolf Schneider, (Opel, Body Exterior Lighting Manager)
Presentation Title TBD

Session 3 will be a first at a DVN Workshop, dedicated to interior lighting:

Robert Isele (BMW, Head of Interior Lighting)
"The Vision of Interior Lighting"

Matthias Merkel (Hella, Interior Lighting Head Program Manager)
"Interior Lighting to Support Future Use Cases"

Dr. James Gourlay (Design LED, CTO)"Dynamic Surface Backlighting"

Michael Brandl (Osram, Automotive Interior Application Engineering Director)
"Dynamic Lighting Enabling New Functionalities"

Björn Sobischek (Future Lighting Technologies, Executive Director)
"Heated & Lighted Textiles"

Session 4 is for set makers digital and HD light module innovations:

Michael Kleinkes (Hella, VP of Lighting Technology and Innovation Development)
"How to Realise One Headlamp for Worldwide Application Using SSL Technology"

Ralf Klaedtke (ZKW, CTO)
"The 5S of Digital Lighting: Smaller, Safer, Smarter, Sustainable & Style"

Andrea Stella (Marelli, VP of Research & Development)
"Lighting Signals 360° Around the Car"

Todd Morgan (Varroc, Senior VP of Global Product Development)
"Lighting Modules for ADAS Sensor Integration"

Benoist Fleury (Valeo, Visibility Product Marketing)
"High Definition Lighting is Great! Yes, But What For?"

Alfonso Orozco Lopez (Mind, Research & Development)
"China Style Trends and Lighting Homogeneity"

Koito (speaker tbd)
"BladeScan ADB Headlamp—New Lexus RX Model"

Taewon Lee (Mobis, Global Business Development Team Manager)
"Introduction of the World's First 3D Lit Image Tail Lamp"

Session 5 is all about light source suppliers' matrix, μ LED, μ Optics and SSL innovations:

Ulrich Frei (Osram, Senior Automotive Exterior Application Engineering Manager)
"Heatsink-less Economic LED Headlamp Approach"

Lars Dabringhausen (Lumileds, Senior Biz Development & Application Design-In Manager)
"Scaling Up ADB Matrix Solutions for Mainstream Market Adoption—Luxeon Neo Exact"

Chadfree Cheng (Everlight, Senior Engineer)
"Brighter Future Enabled by Smart Device: Everlight's SmartLED series"

Hartmut Wettengl (Dominant, Marketing Director for Europe)
"SeddLED—Smart Embedded Digital Driver LED"

Session 6 covers materials, electronics, simulation, and testing:

Alexey Kharitonovich (Mentor Graphics, Senior Product Manager)
"High Fidelity Simulation With Electrical-thermal-LED Models"

Prem Sharma (NXP, Automotive SSL Segment Manager)
"Functional Safety Solutions for Advanced Automotive Lighting Systems"

Andreas Müller (W.L. Gore) & **Hassan Koulouh** (AML Systems)
"Headlamp Condensation Prevention Through Active Moisture Removal"

Jatin Thaker (Elmos, Senior Lighting Product Director)
"Cost Effective & Scalable Interface Solutions for High Resolution Dynamic Lighting"

Jan Helmig (Covestro, Mobility Lighting Global Technical Marketing)
"Optical Enhanced Polycarbonate: From Exterior Lighting to New Interior Design Concept"

And the final session will be a panel discussion chaired by Geoff Draper on regulation of new lighting functions; Six experts will share their vision and views, answering the question how to regulate new lighting functions as road marking, start-up welcome and security lighting projections?

Lighting News

μLED Uptake Driven by Supply Chain Integration



MicroLED technology is expected to bring a revolution to display technology with its high brightness, long lifetime, refined performance and low power consumption.

But its miniature size and the massive amount of chips bring challenges for mass production. Integration within the supply chain is crucial to overcome these

bottlenecks. Partnerships are increasingly being formed to speed up microLED R&D.

Equipment makers, microLED technology developers, and display producers have formed strategic pacts to optimise chip design, transfer technology, and test/repair processes. Amongst these collaborations, several remarkable microLED establishments have gelled in the past two years:

- **Samsung** use microLED chips from PlayNitride and reportedly plan to increase investment this year for volume microLED production.
- **PlayNitride** have teamed up with equipment producers Aixtron and Evatec to increase microLED capacity.
- **Rohinni**, a US-based microLED technology company, partnered with K&S for microLED placement solutions, and launched two JVs with Luumii and BOE.
- **Epistar**, the Taiwan-based LED supplier, will partner with the Leyer Group to build a Micro- and MiniLED production center in Jiangsu province, China.
- **Glō**, a Swedish-American company, partnered with Japan's Kyocera and JDI to devise microLED displays for automotive applications.

Micro LED development has been accelerated with integrations within the industry, bringing the technology closer to commercialisation. The industry is getting ready for mass production and adoption of microLEDs in the coming years.

CES: Pioneering Photonic Applications from Osram



Osram's booth at this year's CES will show off their innovative technology for vehicle lighting and LED projection.

Osram's mobility innovations on display will include the new red XLS exchangeable LED lightsource for stop, tail and rear fog lights. XLS is a standardised, easily replaceable light source that covers a variety of signal and fog applications. Taillight technology offers a first glimpse into the future of automotive exterior lighting and shows

how to use rear lighting to communicate with other drivers and pedestrians on the road.

In an increasingly networked world, Osram's photonic solutions provide security, reliability and peace of mind. VCSEL (Vertical Cavity Surface Emitting Laser) technology enables in-cabin monitoring in Rinspeed's MetroSnap, for example.

And Osram's intelligent LED technology will show how dynamic information can be transmitted in an autonomous driving scenario. For example, Osram's Eviyos smart LEDs are featured in MetroSnap's headlamps. These multifunctional, intelligently controllable LEDs can display warnings or symbols on the road to other drivers, and can indicate to pedestrians that they are seen by the vehicle and it is safe to cross the road. Osram's laser, LED, and IRED components support numerous augmented reality applications, as well.

The New Leon's Glitzy New Lights



Later this month, Seat will launch their latest Leon. In the meantime, they're teasing the world with previews—the latest of which shows the lights.

The headlamps are full LED, of course, and bear the signature Seat complex triangle shapes. Seat have stated that a "dynamic" version of them will be available.

The rear lights span the whole width of the car—Seat call it "coast to coast") also features triangular shapes. It'll have dynamic turn signals, as well. No word yet on what value-added features the optional puddle lights will bring, but Seat have confirmed they'll be available.



EOI's New Automotive Facility



Excellence Optoelectronics (EOI) held a groundbreaking ceremony for their new facility at Taiwan's Hsinchu Science Park.

Once it's built, the new plant will cover an area of 20,000 m² with an 11-floor building housing R&D of miniLEDs for automotive displays and lighting modules. Construction is expected finish in 2021.

EOI supply the tail lights for Tesla's Model 3 and Model Y, and have been increasing their market share in the USA—they have a plant in Michigan, where capacity was expanded in 2018. The company say Ford and BMW will release three new models incorporating EOI lighting modules.



Femtosecond Laser Scribing Advances Solar Tech



A new development project led by Fraunhofer Institute of Laser Technology in Aachen is employing a variety of laser steps, including ultrashort-pulsed scribing, in a bid to help industrialise organic photovoltaics (OPV).

While OPV offers the potential for energy generation with a low cost and flexible technology, its relatively low conversion efficiency and difficulties scaling up production to make large-area panels

have limited commercialisation. The “EffiLayers” project is aiming to make a breakthrough, partly by replacing expensive sputtering processes for coating steps with a wet-chemical approach.

But a femtosecond (10^{-15} second, that is one quadrillionth of a second, or 0.000,000,000,000,001 second) laser scribing process is also set to play an important role. Ultrashort pulses are able to separate layers such that individual cells can be connected in series.

Aside from the laser scribing step, functional layers will be applied on top of each other via wet-chemical solutions and heated slot-die coating. Lasers are involved here as well, with the 10-250 nm-thick layers processed using a variety of short- and ultrashort-pulsed sources.

Driver Assistance News

Bosch Launch Lower-Cost Lidar



Bosch are working to lower the cost of sensors for AVs, and say a new long-range lidar sensor will be the first solution suitable for automotive use. By exploiting economies of scale, Bosch want to reduce the price for the sophisticated technology so it's feasible for the mass market.

Bosch say automated driving can offer acceptably maximal safety only with the parallel deployment of three sensor

principles. For example, if a motorcycle rapidly approaches an automated vehicle at a junction, lidar is needed in addition to camera and radar to ensure the reliable sensing of the two-wheeler. In this instance, radar can struggle to detect the bike's narrow silhouette and plastic fairings, and a camera could be dazzled by harsh light falling on it.

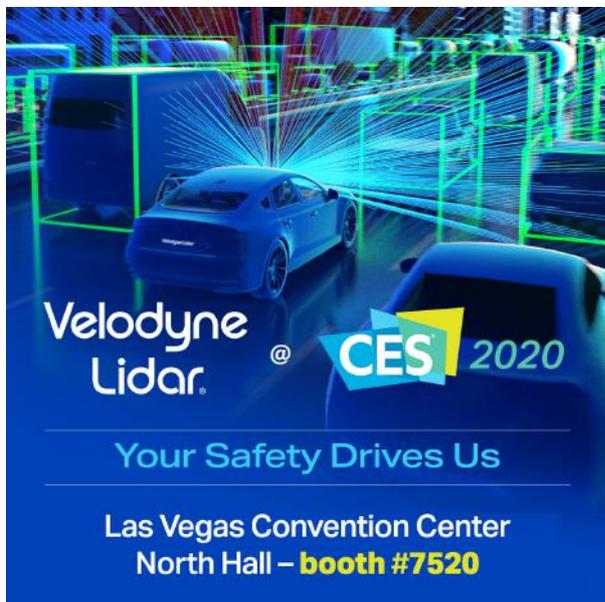
Lidar offers very high resolution with a long range and a wide field of vision. As a result, the laser-based distance measurement tool can reliably detect even nonmetallic objects at a great distance, such as rocks on the road, so there's plenty of time to initiate driving manoeuvres such as braking or swerving. At the same time, using lidar in vehicles exposes the lidar system's components, such as the detector and the laser, to many stresses—above all, with regard to temperature resistance and reliability over the vehicle's entire lifetime.

In 2019, Bosch sales of driver assistance systems rose by 12% to around €2bn. Recently Bosch engineers succeeded in taking the camera technology used in cars to a new level by enhancing it with artificial intelligence. The camera technology detects objects, categorises them into classes such as vehicles, pedestrians, or bicycles, and keeps track of their movements.

Velodyne's Advanced Lidar Tech at CES

Velodyne Lidar will introduce and demonstrate their new lidar sensor technology at CES 2020.

Velodyne will demonstrate how its lidar sensors and Vella™ software can be applied to create ADAS solutions with improved safety, including pedestrian and bicyclist avoidance, lane keeping assist, automatic braking and more. To achieve safe



deployment of autonomous technology, most leaders agree redundant systems with both lidars and cameras are a must. Employing lidar along with a few inexpensive cameras for redundancy allows vehicles to detect and avoid objects in a range of environmental conditions and roadway settings.

At CES, Velodyne will present their proposed Five Diamonds rating system to clarify and standardise terminology for ADAS features. The system aims to encourage transparency in the marketplace and promote the maximum positive effect of ADAS technologies. Velodyne are working with automotive

safety organisations and SAE to foster an industry dialogue to refine and advance the system with the goal of improving driver and pedestrian safety.

General News

Gilles Le Borgne Joins Groupe Renault



As of January 6th, 2020, Gilles Le Borgne joins Groupe Renault as Executive Vice-President Engineering and a member of the Group Executive Committee (CEG). He will report to Clotilde Delbos, Chief Executive Officer for an interim period. Gaspar Gascon Abellan has decided to leave the company to pursue personal projects.

Gilles Le Borgne, 57, is recognized as one of France's leading and most comprehensive experts in vehicle engineering and design. He spent more than thirty years with the PSA Group.

After eight years of R&D on materials and technologies, he became chief engineer of the Citroën C3 phase I platform. He then took responsibility for advanced vehicle concepts for seven years. In 2010, he was appointed head of the Pre-Projects Department, before becoming Director of Research and Development in April 2013 and then Quality and Engineering Director of the PSA Group from September 2016 to May 2019.

Turkey's \$3.7bn Car Project Investment



Turkey has unveiled prototypes of its domestic electric car project as the government announced sweeping incentives to back President Recep Tayyip Erdoğan's ambition to create a Turkish-made vehicle.

Turkey's Automobile JV Group, or TOGG, which comprises five companies and a business umbrella organisation, will establish a factory in the manufacturing hub of Bursa, according to a published

presidential decree. The \$3.7bn investment will enable the production of five models and a total output of 175,000 EVs a year. A compact SUV will be first to launch in 2022, according to TOGG's website. The car was designed by Italy's Pininfarina, and TOGG's COO is Sergio Rocha, who is the former CEO General Motors Korea.

TOGG will benefit from comprehensive tax cuts, free land allocation, interest rate reductions and a government purchase guarantee of 30,000 vehicles until the end of 2035, according to the decree. Turkey already is a big exporter to Europe of cars made domestically by automakers such as Ford, FCA, Renault, Toyota, and Hyundai.



Tesla Begins Deliveries of China-Made Cars



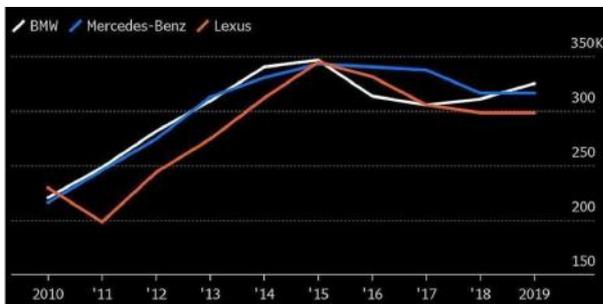
Tesla began deliveries of their locally-made Model 3 electric car in China on 30 December, in a widely-publicised media event held at their newly-built plant in Shanghai.

A batch of 15 Model 3 sedans made at the USD \$2bn "gigafactory" in Shanghai were handed over to local employees of Tesla, with deliveries to local dealers scheduled to start in the new year. Tesla China senior executive Wang Hao told local reporters

the Shanghai plant has already achieved production of 1,000 cars per week and that orders for the locally-made Model 3 have been very strong.

China is the world's largest market for electric vehicles, with new-energy vehicle sales at 1.04 million units in the first eleven months of 2019 despite a sharp decline in the second half of the year. Most of these are battery-powered vehicles. Local production is expected to lower costs significantly for Tesla in China, by eliminating import tariffs and the sourcing key components such as batteries from local suppliers.

US vehicle sales forecast to top 17m for 2019



Analysts at Cox Automotive predict that the US light vehicle market for 2019 will have exceeded 17m units for a record 5th straight year.

	2019	2018	Change
BMW Group	362	355	1.80%
FCA	2,203	2,235	-1.40%
Ford	2,406	2,485	- 3.20%
General Motors	2,887	2,954	-2.30%
Honda	1,608	1,604	0.20%
Hyundai-Kia	1,325	1,267	4.60%
Jaguar Land Rover	125	122	2.60%
Mazda	278	300	-7.30%
Mercedes-Benz Group	358	355	0.80%
Nissan/Mitsubishi	1,466	1,611	-9.00%
Subaru of America	700	680	2.90%
Tesla Motors	223	166	34.50%
Toyota Motor	2,383	2,426	-1.80%
VW Group	653	638	2.40%
Volvo Cars	108	98	10.10%
U.S. LIGHT VEHICLE x1,000	17,108	17,319	-1.20%

Total sales in 2019 are forecast to be down more than 1% from 2018, and this negative trend is expected to continue into 2020.

France Registrations Rose in '19



New car registrations in France rose 27% in December, giving an increase of 1.88% over the whole of 2019 according to raw data from the Committee of French Automobile Manufacturers (CCFA)

published last Wednesday.

After having started the year on the wrong foot because of the disruptions caused by the stricter WLTP certification cycle and the ambient cyclical slowdown, France picked up speed before starting to fall again three months later.

Before their recent slowdown, registrations had chained four consecutive years of growth from 2015 to 2018.

- The registrations of the PSA group, which includes the Peugeot, Citroën, DS, Opel and Vauxhall brands increased by 6.5% in December, compared to the same month of 2018.

- The Renault group (Renault, Dacia and Alpine brands), which warned twice at the

end of July and at the end of October on its annual turnover, saw its registrations in France increase by 30% last month