

# Editorial

## ADAS–Lighting Report Goes Live

The link between lighting and ADAS started a decade ago when AFS used it for anticipation of road curves. Then some years later, cameras were integrated into headlighting to bring ADB. The [DVN Report](#) published today explains how intelligent lighting functions like ADB, marking light, and future functions not yet commercialised increasingly need sensors, while ADAS sensors reciprocally need lighting to better see obstacles and pedestrians after dark. The report goes into detail about the practical exigencies and design implications of in-lamp integration of sensors and cameras.

The central chapters of the report are dedicated to new lighting functions for safety improvements, made possible by ADAS sensors. A variety of adaptive lighting systems are described in terms of the technologies that work together to automatically and dynamically adapt light in all circumstances of driving: environment, weather, roads, speed, traffic and in the future, driver condition (fatigue, alcohol...) to optimise visibility and conspicuity without glare or distraction. These improvements are on the way thanks to better ADAS sensors, and to the evolution of lighting that will bring more and more high definition systems, based on technologies like DMD and  $\mu$ LEDs. Several technologies are presented for new road projection functions to support the driver, improve safety, and communicate to other traffic participants.

Finally, the report presents the authors' outlook, considering our civilisation strives for maximum safety in every circumstances. Lighting has demonstrated a strong added value for safety improvement, and that will surely continue—and, indeed, accelerate—going forward, as driver assistants and automated driving systems will need to give information not only to the driver, but also to other road users, while also receiving information from others and from the environment. For these kinds of communication, lighting will be central.

I remind you the two events coming, [Smart Interiors Online DVN-I Workshop](#) in September, and [VISION congress](#) in October, with 40 lectures and 30 expo booths. See below, information on these two events.

Sincerely yours



DVN PRESIDENT

# In Depth Lighting Technology

Smart Interiors Online DVN-I Workshop: Don't Miss It!

- SAVE THE DATE -

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**CAR SMART INTERIOR  
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The inaugural DVN-Interior Workshop will be held online 24 September, with the rubric **Car Smart Interior**. The lecture docket is nearly final, including two keynotes that promise to be quite exceptional.



Valeo's new CTO Geoffrey Bouquot will talk with DVN-I Workshop chief Philippe Aumont about Smart Technology for Smart Interiors. And Streetscope's Mobility Futurist and VP Dave Muyres will talk about Future Mobility's Many Challenges.

We expect a total of 20 lectures presented by managers and experts involved in car interiors from automakers and suppliers including Audi, BMW, Honda, PSA, Renault, Adient, Covestro, Dräxlmeier, Faurecia, Future

Lighting Technologies, Hella, Marelli, Osram Continental, Recticel, Sensata, Texas Instrument, Valeo, Weisplas, Yole, and ZF. EPIC CEO Carlos Lee and ISELED CEO Robert Isele will also participate.



Here's a preview of the docket and agenda:

### **Session 1 • Interior as a System**

*Cockpit of the Future* (Faurecia) by Andreas Wlasak, Chief Designer

*Smart Cocoon* (Valeo) by Georges de Pelsemaeker, THS Health and Wellbeing Director

*Interior Architecture* (Audi), speaker TBD

### **Session 2 • Any Surface Becomes Functional**

[Lecture title TBD] (Honda) by Ryou Chijimatsu, General Manager Interior R&D

*Giving Any Surface a Switch Function and More* (Preh) by Dr. M. Lust, Head of Pre-development

*Sensor Integration on IP Skins* (Recticel) by Geert Trossaert, Head of R&D *New Functional Plastic Technology*

(Weidplas), speaker TBD *Leather Functional Surface, Artificial & Genuine* (Dräxlmeier), speaker TBD

### **Session 3 • Interior Lighting**

[Lecture title TBD] (BMW) by Robert Isele, Head of Interior Lighting

*New Interior Lighting Technology* (Hella) by Dr. Herbert Wambsganss, Head of Interior Light

*Smart Interior Projection* (Osram Continental) by Dr. Michael Rosenauer, Head of Advanced I

*ISELED, the Next Generation of Smart LED* (Inova Semiconductors) by Stefan Hoffmann, ISELED

*Alliance Introduction* (ISELED) by Robert Kraus, ISELED President and Inova CEO

### **Startup Pitches During Virtual Lunch**

Moderator: Philippe Aumont, DVN-Interior General Editor

### **Session 4 • Seating**

*Configurable Seating for L<sup>2+</sup> Autonomy* (speaker TBD) Renault R&D

*Smart Textiles* (Future Lighting Technologies) by Bjoern Sobischek, Technical Sales

*Materials and Technologies for Tomorrow's Interiors: Composite Seat Back* (Covestro) by Ronan Legoas, Global Key Account manager

*IR/UV* (Yole) by Pierrick Boulay, Solid State Lighting and Lighting Systems Analyst

*New Role for Sensors in Seats* (Sensata) by Eric Sorret, VP Performance Sensing

*Intuitive Seat Comfort Adjustment* (Adient) [speaker TBD] or *Lightweight Adjustable Seat Structure* (ZF) [speaker TBD]

### **Session 5 • Interior Design, Simulation, Software and Electronics**

*Configurable Digital Cockpit* (PSA) [speaker TBD]

*HMI and 3D Display* (Marelli) by François Nivelles, HMI & Advanced Engineering *DLP Technology for Display*

*Applications* (Texas Instruments) by Ross Schneider, Application Engineer

*Displays: Challenges for the Future* by Prof. Karlheinz Blankenbach, German Flat Panel Forum Chairman *EPIC*

*Introduction: Photonics Industry Association*, by Carlos Lee, EPIC Managing Director

# Lighting News

## VISION Congress Confirmed, With Safety Constraints

LIGHTING NEWS



SIA, the French Society of Automotive Engineers, are proceeding with great confidence their biennial lighting and ADAS event shall be held on 7–8 October in Paris.

The 10<sup>th</sup> biennial VISION congress will continue in its usual format—plenary lectures in the auditorium and around 30 expo booths. The SIA organisation team and the VISION Steering and Scientific Committees are working to address the new safety challenges brought by the pandemic, and state that the event will be held in compliance with all regulations and best practices for hygiene and distancing to allow participants to network, learn, and meet in the best possible ways.

The participant count cap has been lowered to 485 to maintain social distancing rules with 1 seat out of 2 in staggered rows in the auditorium and 1 person per 4 m<sup>2</sup> in the exhibition areas. Sanitising gel and single-use masks will be distributed to all participants during the entire event. These measures are more restrictive than the official regulations in force by the event venue.

Of course, the situation is liable to change between now and then, and SIA have committed to review these procedures in early September and adapt them in accordance with government directives and the Covid-19 situation more generally.

In the meantime, they've posted a [video](#) about the event.

# Luc Brisson, New SVP Product Development of Varroc LS

LIGHTING NEWS



Luc Brisson has joined Varroc Lighting Systems as the Senior Vice President of product development replacing Todd Morgan.



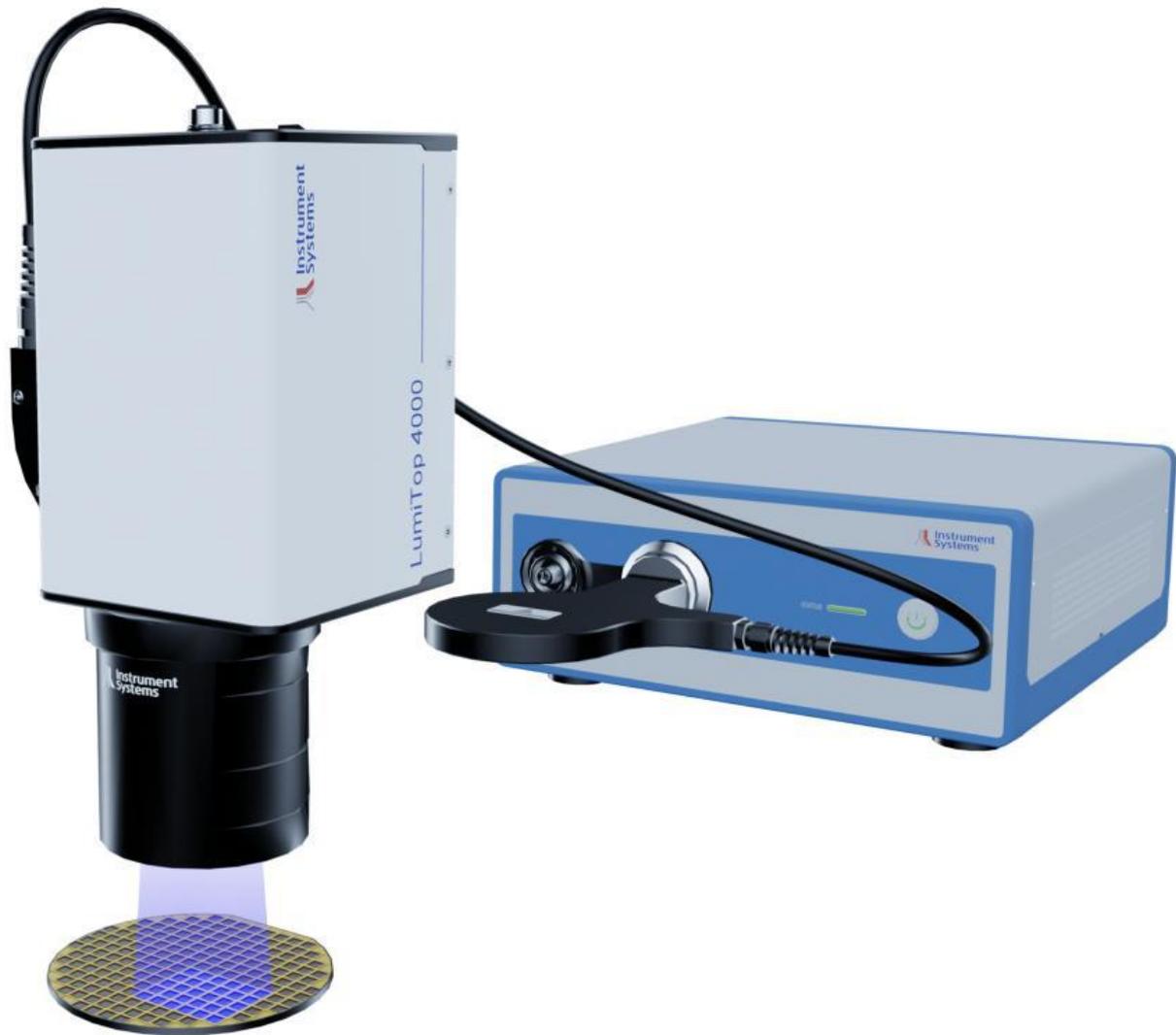
Luc Brisson will assume responsibility for the leadership of the global product development team, and will report directly to Stephane Védié, CEO Varroc Lighting Systems. He will be based in Krakow, Poland.

Luc Brisson, engineer from the «Ecole des Mines de Douai» started at Visteon in 1995, and after working at Alcatel and Delphi (now APTIV), he served as the global engineering head at APTIV Connectivity and Security. He has worked in France, Poland and China.

Luc brings over 25 years of automotive experience to his new role with Varroc Lighting Systems. His strong knowledge and expertise in electronics and systems development will add value to the 900 global members of the product development team.

# Instrument Systems: Optical Wafer Testing for $\mu$ LEDs

LIGHTING NEWS



Instrument Systems of the Konica Minolta Group introduces a camera-based measurement solution for  $\mu$ LED wafer testing that generates 2-dimensional, pixel-resolved optical analyses within given cycle times. The LumiTop 4000 can detect the smallest of defects and inhomogeneities on the wafer. Thanks to a 100 mm macro lens, the camera enables fast parallel inline analysis of all  $\mu$ LEDs on a wafer at a single test station.

For efficient testing of thousands of Micro LEDs on a wafer, the test procedure must be parallelized. The manufacturer is thus required to simultaneously contact as many  $\mu$ LEDs as possible. In addition, the optical inspection should be fast and accurate, and performed synchronous to the production flow. This functions only with a 2D measurement using specifically calibrated instruments to prevent measurement errors.

The LumiTop family from Instrument Systems offer a solution combining 2D camera with a spectroradiometer that serves as a simultaneous reference measuring instrument for highly accurate readings. The new LumiTop 4000 can be used for  $\mu$ LED wafer testing.

With a field of view (FoV) of approximately 1.0 by 1.4 cm, the new LumiTop 4000 can measure many thousands of Micro LEDs in parallel with a minimum pixel size as low as 30  $\mu$ m.

# Toyota, Freightliner Recall Trucks With Faulty Lights

LIGHTING NEWS



Toyota discovered an assembly line mistake in how the front turn signals were hooked up on close to 185,000 Tundra pickup trucks made in 2018–20 and equipped with LED headlamps.

The error results in the front turn signals, which use incandescent bulbs, being too dim to meet the minimum intensity requirements of U.S. Federal Motor Vehicle Safety Standard № 108, so Toyota notified NHTSA and a recall schedule has been arranged. Canada Motor Vehicle Safety Standard № 108 contains identical requirements, and the Tundra is sold in Canada as well, but DVN has not (yet?) had word of a Canadian recall or repair effort. In the U.S. recall, owners will be notified to bring their truck to a Toyota dealer for the wiring connections to be corrected, restoring full intensity to the front turn signals.

Meanwhile, Freightliner—a brand of Daimler Trucks North America—have recalled over 12,000 vehicle chassis for a second time, as well as some chassis for the first time, for lighting failures that led to a recall in 2018. Two dozen Freightliner models built between 2015 and 2018 are affected. During manufacturing, a circuit board in the trucks' power distribution centre may have been subjected to bending stresses that could lead to intermittent open circuits and failure of the rear marker, stop, and turn signal lights. In June, NHTSA notified Daimler of a customer complaint and two field complaints possibly related to the earlier recall. Daimler investigated and found vehicles with the same issue built after the 12,311 chassis identified in the first recall.

# Revised Ansys Software Accelerates Innovation

## LIGHTING NEWS



ANSYS SPEOS VALIDATES PERCEPTION OF THE CAMERA IN DAY, NIGHT, FOG

Ansys say the new version of their 2020 R2 engineering software delivers enhanced simulation and collaboration capabilities to help engineers generate larger and more complex designs quickly.

2020 R2 incorporates new technologies for the development and validation of autonomous vehicles, such as advanced lidar models and new sky models. These allow for enhanced daylight simulation to extend the hardware-in-the-loop simulation of the camera.

Optical headlight simulation results from Ansys SPEOS can be imported into Ansys VRXPERIENCE. The headlight and use scenarios created in the Ansys VRXPERIENCE powered by SCANeR driving simulator make it possible to create driving films with vehicles equipped with virtual prototype lighting and safety equipment. The results can facilitate post-processing and data visualisation for lamp certification, replacing expensive and complex nighttime testing. These tools also give an advantage in demonstrating high quality, sustainable automotive lighting solutions through realistic and reliable photos and videos.

# Survey Looks at Car-Tech Public Acceptance

LIGHTING NEWS



The WISE ACT (Wider Impacts and Scenario Validation for Autonomous Connected Transport), an initiative that draws together more than 150 experts from 41 countries, is conducting an international survey in order to better understand public acceptance of automated vehicles.

While there has been a great deal of focus on automotive technology and connected infrastructure, less is known about how the public will react to the roll out of CAVs (connected and autonomous vehicles) and how much travellers might be willing to pay for such services.

"We've already launched our survey in 15 countries and we're going to launch another 10 in the next few weeks", says WISE ACT chair Dr Nikolas Thomopoulos (photo), who is also a senior lecturer in transport at University of Surrey in the UK. "We're essentially trying to find out what potential users think of CAVs. Because, so far, most of the conversations have been led by private entities, which are essentially putting in all of the money, and by governments, who try to give some guidance, some regulations, or some flexibility for those companies to develop this. So, in this environment one element is missing – the user perspective.

"If the companies give us these vehicles, and if the government allows us to travel, but no one is using it, where's the benefit? And if we consider the amount of money and funding and effort that's going into this, we think it is wise that there has to be some kind of balance. How much are people willing to pay for an automated vehicle trip?".

# Valeo Describe Losses, Cuts Due to Pandemic

LIGHTING NEWS



Valeo are facing a loss of €1.2bn in the first half of this year, on account of the coronavirus pandemic, and have cut some 10% of staff in an effort to reduce spending.

The company recorded €622m worth of one-time charges and a 28% drop in comparable revenues in 1H20, and have taken measures to contain cash expenditures as they work to recover from the pandemic. They have cut 12,000 jobs and slashed investments.

CEO Jacques Aschenbroich (photo) says *"With the Covid-19 crisis, we are witnessing both a growing preference for individual mobility and accelerating demand for safer, electric mobility all over the world. This trend further demonstrates the relevance of our strategic choices. Measures have been taken on an exceptional scale to ensure the continuity of our operations going forward, including cost savings of €570m and a reduction of €384m in investments and gross inventories"*.

# LG's Preliminary 2Q20 Earnings

LIGHTING NEWS



LG Electronics released their preliminary earnings for the second quarter of 2020: tentative consolidated revenue of USD \$10.6bn, with an operating profit of \$410bn.

LG say 2Q20 sales are expected to underperform 2Q19's figures by 18%, with operating income decreased by 24%.

In 1Q20, LG broke their first-quarter operating margin record, reaching 7.4% with a profit of \$905m largely on strength of their home appliance and home entertainment divisions.

# ZKW are Top Patent Registrant in Lower Austria

LIGHTING NEWS



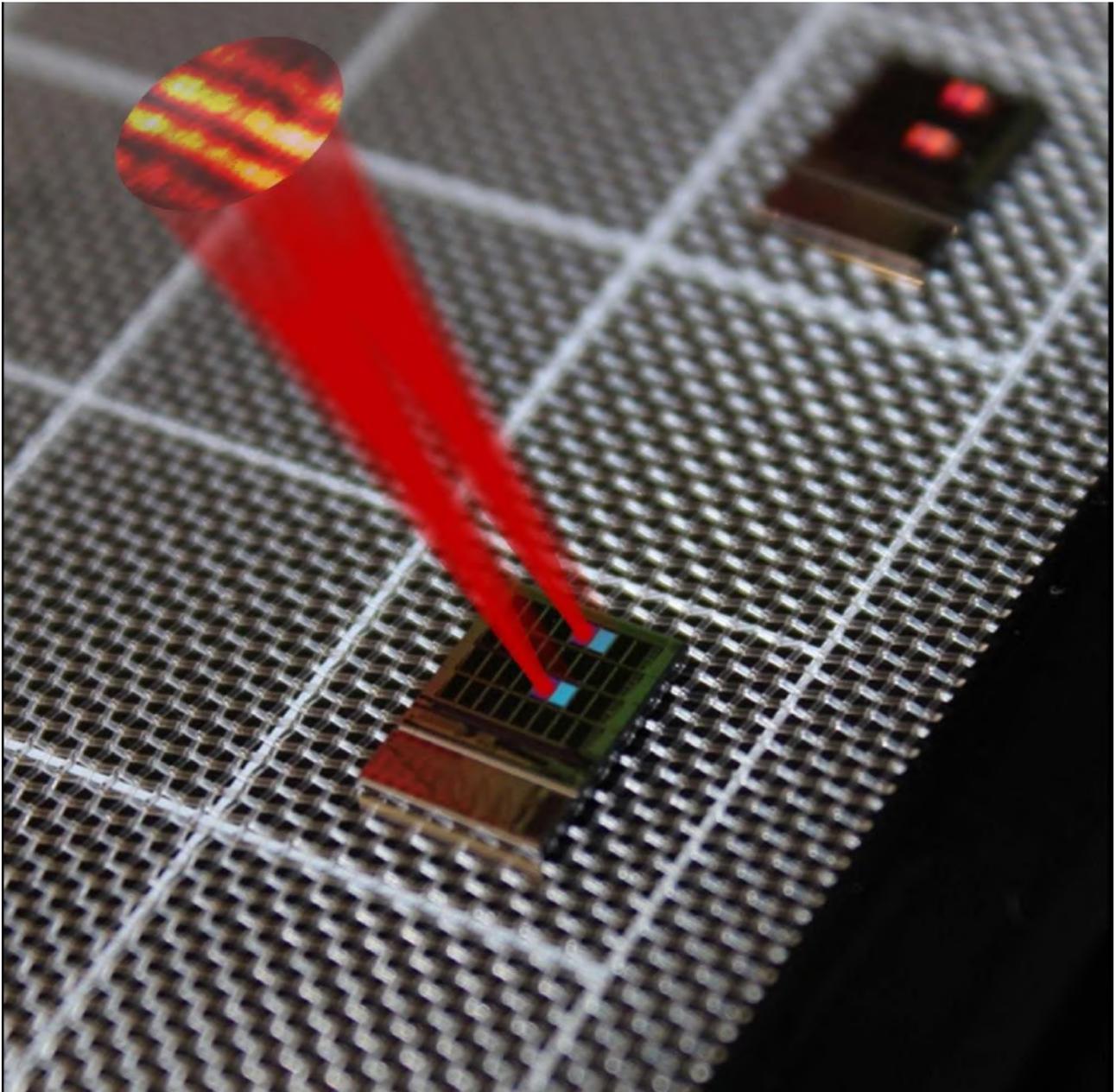
The ZKW Group submitted a total of 51 new patents last year, making them № 1 in their region and № 4 in Europe. As an international group company, ZKW increasingly submit their patents in international markets including China, the USA, and Germany.

R&D is prioritised at ZKW. They test new products in their own light tunnel, one of the world's largest, as they develop lighting systems for the future, such as headlights with intelligent functions for autonomous driving. Some recent ZKW patent registrations have dealt with digital light processing systems with micromirrors, over a million individually-addressable ones, to focus as much light as possible on the road, while avoiding blinding other traffic participants and offering new features like spot illumination of traffic signs and information or warning symbols projected onto the road surface.

# Driver Assistance News

## New Lidar Technology Breakthroughs

DRIVER ASSISTANCE NEWS

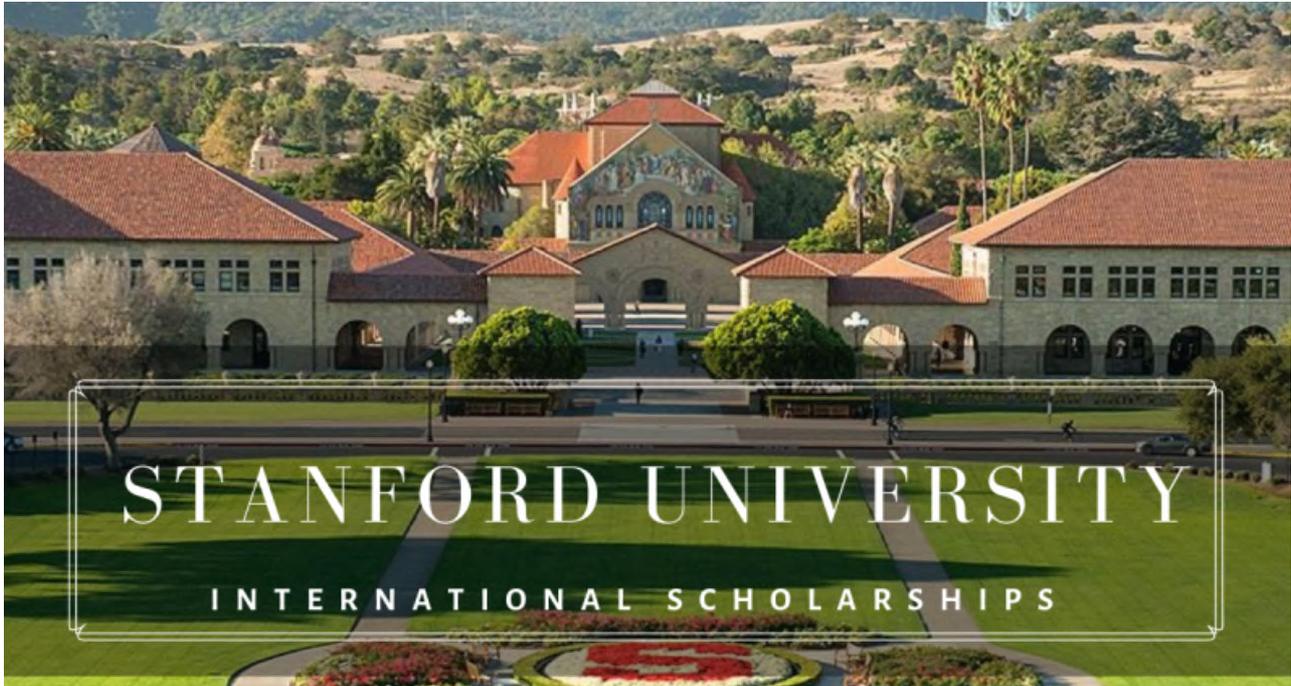


Two recent research efforts have brought new solutions to improve lidar sensing technology. From the University of Colorado at Boulder comes a new silicon chip without moving parts or electronics that enhances resolution and scanning speed for lidar sensors. The research aimed to develop small chip to replace existing big lidar systems, so the research team devised what they call wavelength steering, wherein each wavelength of the laser is pointed to its own angle. The chip thus provides not just a 2D scanning function but also 3D images with colour. Since the beams are easily controlled by simply changing wavelengths, multiple phased arrays can be controlled simultaneously to create a bigger aperture and a higher-resolution image. The researchers believe the approach can lead to cheaper and less complex lidar products for the market where demands for sensing and detecting applications continue to expand. The study has been [published in Optica](#).

And researchers at the University of Purdue and École Polytechnique Fédérale de Lausanne (EPFL) unveiled their development with FMCW lidar. The research team built a method to enable FMCW lidar to achieve detection with higher resolution of fast-moving objects through mechanical control and modulation of light on a silicon chip. The technology integrates MEMS transducers made of aluminum nitride to modulate the microcomb at high frequencies ranging from megahertz to gigahertz. That study has been [published in Nature](#).

# Lidar: The driving force behind AV

## DRIVER ASSISTANCE NEWS



### *Extract from ElectroOptics, July 2020*

In the last couple of months, a number of announcements have further demonstrated that lidar has made significant progress in being compact enough and produced economically enough to make it a viable option to compete with cheaper alternative technologies.

A team of researchers at Stanford University has been striving towards making lidar smaller and more cost effective. The team, led by electrical engineer Jelena Vuckovic, are working on shrinking the mechanical and electronic components in a rooftop lidar down to a single silicon chip that could potentially be produced at volume for just a few hundred dollars. The study, published in Nature Photonics, saw researchers structure the silicon in a way that used its infrared transparency to control, focus, and harness the power of the photon. The process used was called "inverse design"; Vuckovic's lab has pioneered it over the past decade.

There are also significant moves forward in business case scenarios, as evidenced by autonomous vehicle sensor and software firm Luminar, whose lidar technology was selected to be included in Volvo's next generation of cars. Those cars will be manufactured in hardware-readiness for autonomous driving as soon as 2022.

From a manufacturing standpoint, lidar experts LeddarTech recently announced they will begin volume production of their Pixel Cocoon lidar module in a manufacturing partnership with Clarion. The module is a 3D solid-state flash lidar with a 180-degree field of view. It is designed and tested for off-road, shuttles, robotaxis, delivery, commercial and heavy industry vehicles in addition to other robotic and automated applications. It can reliably detect pedestrians, cyclists and other obstacles in the vehicle's vicinity, and has already been adopted by a number of autonomous vehicle providers in North America, Asia, and Europe.

# Mobileye and Ford Expand Partnership

## DRIVER ASSISTANCE NEWS



Mobileye have expanded their partnership with Ford to offer camera-based detection capabilities for the automaker's ADAS. Mobileye will provide their EyeQ sensing technologies to bolster features available through Ford's Co-Pilot 360 suite, including lanekeeping, pedestrian and cyclist detection, automatic headlight beam selection, pre-collision assist with automatic emergency braking, and adaptive cruise control with stop-and-go and lane-centring.

Along with the EyeQ family of devices, Mobileye will supply vision-processing software to support L1-2 driver-assist systems in Ford cars globally as part of the expanded partnership. New Ford vehicles will bear the EyeQ3 and EyeQ4 chips to identify what the windshield cameras can see and to power the Active Drive Assist hands-free mode, in addition to Co-Pilot 360 in the Mustang Mach-E and F-150.

Mobileye are building two independent self-driving systems. One is based entirely on cameras and the second incorporates radar, lidar sensors, modems, GPS, and other components. Both confer the full benefits of the Responsibility-Sensitive Safety (RSS) model, an open policy that imposes "common sense" constraints on the decisions driverless vehicles make, and Mobileye say the latter should be able to travel roughly 100 million hours without a crash.

Mobileye technology undergirds ADAS in 300 car models across 27 automakers, and collects nearly 6 million kilometres of sensor data every day, which is supplemented with geospatial corpora like OS MasterMap and Ordnance Survey. The company expect to have more than a million vehicles in their European fleet by the end of 2020, and that same number in the U.S. a year later; by 2025, Mobileye anticipate their fleet will span more than 25 million vehicles globally.

# Germany May OK L4 Autonomy On Public Roads

## DRIVER ASSISTANCE NEWS



The German Government is preparing landmark legislation that could commercialise driverless vehicle technology by next summer. If passed, it could be the first comprehensive legal framework covering both homologation and road traffic requirements for robotaxis in which the computer controls the vehicle at all times.

The hope is to have the draft approved by Germany's lower house of parliament before it starts its summer break next year. It is at that point that passing legislation takes a back seat to campaigning for the country's 2021 general election.

The draft legislation is currently undergoing interdepartmental revisions, which is why it has not been made public yet. Any proposal would have to be passed by the entire cabinet before being sent to German members of parliament and finally to the upper house that represents the country's 16 federal states.

This would cover the most advanced form of L<sup>4</sup> autonomous driving, in which the vehicle would be able to steer itself in almost any circumstance within tightly defined parameters known as an Operational Design Domain.

"Germany is making a great step signaling both to the European Union as well as the rest of the world the common excuse that regulators are holding up viable business models is no longer valid", said Ricky Hudi, a former executive vice president for electronics development at Audi. "This represents a huge opportunity to drive innovation in the industry and it's not geared just to the German carmakers: it's open to any provider around the world."

# General News

## Renault hires Seat's former design boss, source says

GENERAL NEWS



Former Seat design director Alejandro Mesonero-Romanos, 52, will join Renault “to strengthen the design team,” the source said, adding that he will report to Renault Group design boss Laurens van den Acker.



A Seat spokesperson confirmed that Mesonero-Romanos had left the company at his own request. “Seat thanks Mesonero-Romanos for his excellent work at the head of the design team over the past nine years and wishes him all the best for the future,” Seat said. - In 1994, Mesonero-Romanos started his career joining Seat’s design department. During his first seven years within the Volkswagen Group, he led exterior design for several Seat, Volkswagen, Audi and Lamborghini brand projects.

- In 2001, he joined Renault in Paris, to be from 2007 to 2009 the head of the advanced design department. He left that post to become design director at Renault Samsung Motors in South Korea.

- In 2011, Mesonero-Romanos returned to Seat as head of design, where his work contributed to the financial turnaround of a brand that had suffered years of deep losses. The introduction of a series of successful SUVs, the Ateca, Arona and Tarraco, helped make Seat profitable again.

He also designed the fifth-generation Ibiza small car and the latest two generations of the Leon family of compact models. He also shaped models such as the Formentor and Tavascan as stand-alone models for Seat's Cupra subbrand.

# Deloitte's Takeaways for Post-COVID Mobility

## GENERAL NEWS



Automotive manufacturers have to entice consumers back into the new vehicle market despite strong evidence to suggest that vehicle demand was already headed for a downturn. Industry forecasters are now expecting global new vehicle sales to total just more than 70 million units in 2020, a downgrade of 18.5 million light vehicles

In a report, Deloitte said everyone in the automotive supply chain is feeling the pressure of the disruptive pandemic and recovery will take time, even as local jurisdictions start to reopen. We retain 3 takeaways on the future:

### **1. Shared mobility will recover from rider anxiety**

While many public transit leaders fear that ridership will not rebound as people continue to stay away, the report says there will be many consumers who return to shared transportation services in time.

### **2. Congestion worries may be eased by teleworking**

Fears of increased congestion in cities are building as more travelers opt to get around in personal vehicles. It will take time, but once recovery is underway, there will be a "self-correcting mechanism that will create the right dynamics" for traveling without too much increased congestion.

### **3. Consumers will pay for safety features on new cars**

The deployment and growth of autonomous vehicle (AV) usage continues to be a major question mark over the future of cities, but while the promise of AVs is exciting, the report said we still have a long way to go before fully autonomous cars are on the streets. Instead, consumers will continue to pay for technology that enhances safety like ADAS.

# Will Chinese EVs Take Over The World?

## GENERAL NEWS



### Extract from Forbes

China has caught up with the West's automotive design abilities and even overtaken, with one area of particular note: electric vehicles. By 2019, there were already 2.58 million battery electric vehicles (BEVs) in China, compared to less than a million in Europe, and less a million in the USA.

China also has more home and work chargers than any other part of the world, more public slow chargers than the rest of the world put together, and 82% of the global fast charger installations.



Chinese cars didn't feel like competition for European and American brands when they couldn't compete on quality, but many of these examples have a specification and design that might be close enough, at a much lower price. China is the world's largest producer of lithium, crucial to EV batteries. China also controls 62% of global chemical cobalt and 100% of spherical graphite, also key component elements in the lithium-ion battery technology.

# Tesla Report Quarterly Profit

## GENERAL NEWS



Tesla are reporting second-quarter net income of USD \$104m, marking their first string of four consecutive quarterly profits in spite of the ongoing coronavirus pandemic.

Tesla delivered 91,000 vehicles in the quarter, down 5% from the same period a year ago. "Our business has shown strong resilience during these unprecedented times," Tesla said in a statement. "We believe the progress we made in the first half of this year has positioned us for a successful second half of 2020. Production output of our existing facilities continues to improve to meet demand, and we are adding more capacity. Later this year, we will be building three factories on three continents simultaneously."

Earnings were also aided by lower operating costs due to a temporary reduction in employee compensation as well as deferred revenue recognition related to a future self-driving system.

The site for Tesla's new factory outside of Austin, Texas will be open to the public and will be an "ecological paradise", according to CEO Elon Musk. The plant will build Tesla's Cybertruck pickup, semi truck, Model Y crossover and Model 3 sedan. Musk said the company will continue to improve their production systems—an area of weakness in the past, particularly when they began building the Model 3. "There's far more opportunity for innovation in manufacturing than the product itself", Musk said. "The long-term sustainable advantage of Tesla, I think, will be manufacturing".