

## PixCell LED

Ultimate precision in perfect alignment

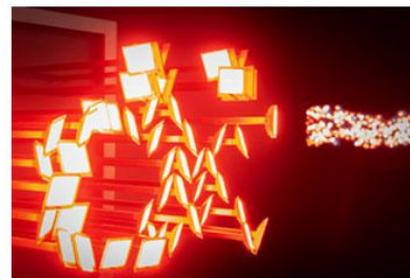
100+ individual cells with just 25 µm spacing, perfectly matrixed onto a single LED chip for intelligent headlamps

SAMSUNG



# Editorial

## One Visit Last Week; Two DVN Events In The Next Two Months



In today's newsletter, we look at three significant events:

**Last week's special exhibition at Audi's museum: "The Speed of Light"**, showing the past and the future of vehicle lighting. You'll find a very interesting article from Michael Hamm, presenting the event.

### **Next week's DVN Lidar Conference near Frankfurt**

Marc Vrecko, CEO of Valeo's Comfort and Driving Assistance business unit, will open the Lidar conference; Christian Kobetz from Mercedes-Benz will give deeper insight into his company's Drive Pilot; Guillaume Point will talk about lidar application at Stellantis, and Patrick Piastowski from Ford will elaborate on sensor requirements for autonomous driving.



MARC VRECKO  
VALEO



CHRISTIAN KOBETZ  
MERCEDES-BENZ



GUILLAUME POINT  
STELLANTIS



PATRICK PIASTOWSKI  
FORD

### End January: DVN Lighting Workshop in Paris.

The 26<sup>th</sup> DVN Workshop, the greatest DVN event ever, will be at the prestigious Hyatt Regency Paris Etoile Hotel to celebrate the 15<sup>th</sup> anniversary of DVN. That's a decade and a half's time over which DVN has attracted 200 Gold members and published 750 weekly Newsletters; 175 monthly Reports, and five Studies, and organised 25 Workshops. The Paris event this coming January will bring together more than 300 worldwide participants; managers, and experts involved in lighting. It's going to be great; we'll see you there!



Sincerely yours

  
DVN CEO

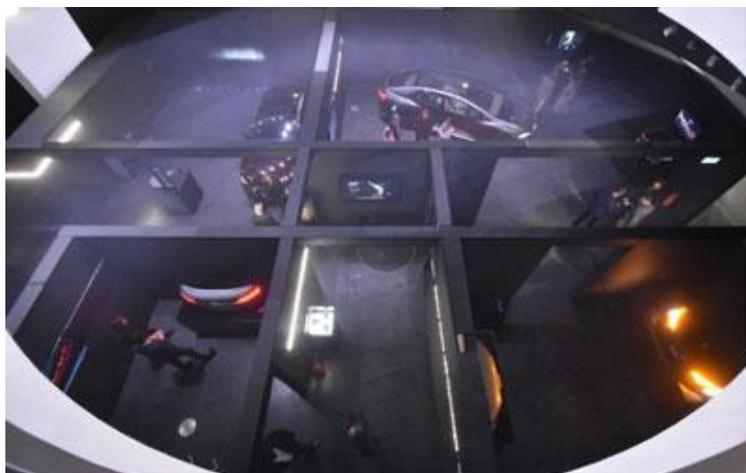
# In Depth Lighting Technology

**Samples to Touch, Cars to See: History and Future at Audi Museum**  
*from Michael Hamm, former manager at Audi,  
DVN Senior Advisor*



INNER CIRCLE OF EXHIBITION WITH MODERN CARS

It is a very rare occasion to get in touch with more than 120 years of vehicle lighting history in one place, but the special exhibition "Speed of Light" makes that possible.



The Audi tradition team worked out a very impressive deep dive on lighting in cooperation with the lighting experts from Audi. The everlasting problem of the lighting community is that most lighting is best visible at night, but the museums open at day. To face that challenge, one complete level of the Audi Museum was fully put into darkness. "A night at the Museum" is now possible for daytime visitors. (In this case only the lighting samples are waking up).

On Thursday 17 November, the exhibition started with an opening ceremony. Ten vehicles serve to trace and represent the various epochs in lighting technology, while many other touch-and-see demonstration exhibits illustrate the functionality and the fascination of constantly evolving headlight and rear light technologies.



It is a very interesting experience to see the technical explanations and to understand that at the time the cars were built the lighting technology was considered to represent top performance level. Unfortunately, the technical improvement continued and after a while the acetylene lamps were put in the historic bin. Some years later the tungsten filament bulbs followed or as we are at the brink where xenon might soon have the same destiny. This is one of the exciting lectures during the walk: innovations are always followed by innovations. LED and OLED in digital lamps are demonstrated as today's state of the art.

Very interesting for the visitors are the many explaining touch screens where a deep dive in the actual technology is possible from the old acetylene lamps over tungsten; halogen; xenon; LED and digital projector headlamps as well as OLED and DRL signatures.



EXHIBITION BOX FOR DIGITAL LIGHTS

And visitors can make experiments on their own-experiencing with their cell phone lamps how a matrix LED high beam produces a glare-free zone; how OLEDs are made for 3-dimensional design perspective, and what a digital projection on a road might produce as future welcome scenarios.



DO IT YOURSELF: TRY A MATRIX BEAM

The oldest car exhibited is an Audi Type C from 1919 with acetylene headlights; other historic cars follow like a 1936 Horch 850 with Bilux (2-filament) lamp and a 1954 DKW F 91 with yellow fog lights.



OLDTIMER LIGHTS

One of the rare 2014 Audi R8 LMX with laser high beams, other cars with HD Matrix LED headlights, OLED lamps, and digital daytime running lamps are shown. And—since only history might be boring—also future digital concepts are shown, such as the Audi AI:CON concept car.



THE FUTURE OF LIGHTING

Stephan Berlitz, Head of Lighting Development at Audi's Technical Development unit, says: "Lighting technology continues to become increasingly important, with its outlook now changing. While safety remains the most important development aspect, in the future, car lights will be able to do more than give light. Audi is pioneering a new dimension of automotive lighting technology and so lights are becoming an important means of communication with other road users".

"The Speed of Light" can be viewed at the Audi Museum mobile from 18 November 2022 to 4 June 2023, and digitally on the Audi Tradition app. With this app, visitors receive in-depth content on the cars and exhibits on display in text form; for selected vehicles, there is an audio guide and even a 360-degree panoramic view.

Yes, it is really worth a visit!

# Lighting News

## Li Auto L7 design revealed

### LIGHTING NEWS



A declaration drawing of the Li Auto L7 shows a star-ring LED light design with the high and low beam below in the front fascia. The rear full-width light bar has a blackened cover lens.

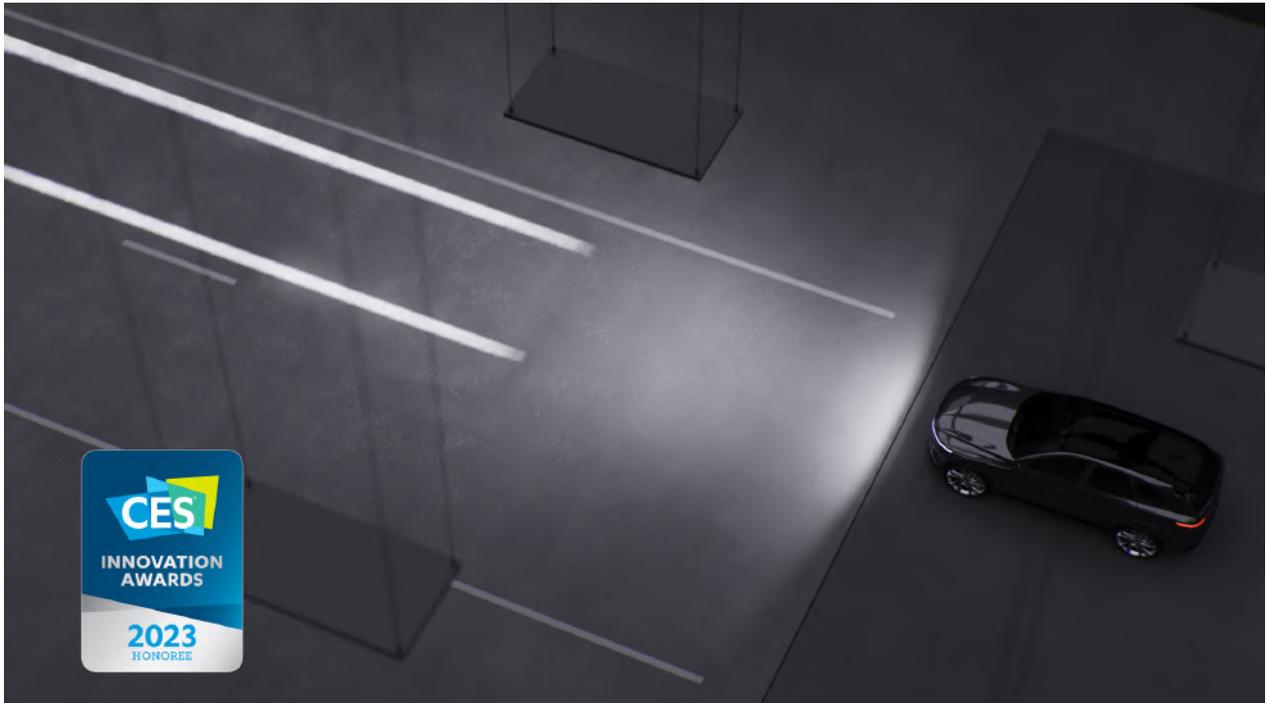


The L7 is officially described as a flagship five-seat medium-large SUV, priced around €50k. Lidar is offered as an option; vehicles without it won't have the bulge at the leading edge of the roof just above the windshield.

Li Auto released their first Li One model in October 2018. In 2020, the company won the sales championship of China's new-energy SUV market. By the end of this past June, the cumulative delivery volume of Li Ones had reached 185,000 units.

# HELLA Digital HL: CES 2023 Innovation Award

## LIGHTING NEWS



HELLA receives the CES 2023 Innovation Award in the category "Vehicle Tech & Advanced Mobility" as "Honoree" for its digital, chip-based headlamp system "Solid State Lighting | High Definition" (SSL | HD).

HELLA's SSL | HD technology represents the evolutionary further development of LED matrix systems: with this innovation, the light source is further miniaturized so that up to 25,000 LED pixels per chip are deployed in a significantly reduced installation space. This not only provides better illumination of the road, but also enables new lighting functionalities such as the projection of safety distances or lane markings onto the road.

"We are driven by the ambition to keep pushing the boundaries of what is feasible in automotive lighting technology and thus ensure greater safety, efficiency and comfort in road traffic," says Yves Andres, who as a member of the Management Board is responsible for HELLA's global lighting business.

HELLA had also launched SSL | 100, a smaller version of a 100px LED matrix system. The overall module size has been reduced by 74% and weight by 14% compared to previous 84-pixel module, giving vehicle designers more design freedom. The size of the light-emitting area could be reduced by a factor of 23, which was realized by a reduced pixel size and a smaller installation space down to 25  $\mu\text{m}$ .



With the integrated silicone walls between the pixels, the contrast ratio could be increased to 1:300.

# AMS Osram's New Network

## LIGHTING NEWS



AMS Osram have launched a new Global Partner Network of design consultancies; module suppliers and supporting component manufacturers to accelerate customers' time to market and facilitate new business opportunities while leveraging the latest optical and sensor technologies.

Partners are selected based on their technical expertise; product offerings, and track record of working with customers to co-create new products. The Global Partner Network encompasses hardware; software; tools; services, and expertise to quickly capitalise on present megatrends without huge investment.

AMS Osram executive VP of global sales and marketing Pierre Laboissee says the GPN ensures that «any customer can take advantage of our technologies, no matter how much design experience or resources it has internally».

The network includes diverse partners, so interested AMS Osram customers can readily procure the appropriate solution or service. The partners include:

- Module and solutions providers—manufacturers of modules which perform a complete function;
- Independent design houses—design consultancies which provide deep expertise in the use of AMS Osram components, offered to customers via dedicated design concepts, design implementations, production, testing or supply chain services;
- Manufacturers of complementary offerings—companies supplying complementary solutions which, together with AMS Osram products, facilitate the integration of technology at the system level, and
- Manufacturers of recommended components—certain AMS Osram products require secondary components to realize their intended function. Recommended components are approved or tested for operation with AMS Osram products. Members of the network will benefit from a formal framework for cooperation with AMS Osram. This includes direct expert-to-expert interaction with AMS Osram specialists; access to samples for early design and testing; mutual promotion of each other's products in sales collateral, and joint discovery of new business opportunities.

# Tesla Issue OTA "Recall" Fix for Failing Taillights

## LIGHTING NEWS



Over 321,000 Tesla cars are being recalled in the United States, because their taillights only work some of the time. In a filing with NHTSA, Tesla disclosed the recall covers 'some' 2023 Model 3 and 2020-2023 Model Y vehicles. An over-the-air update will be pushed to correct the rear light failure, which is said to be due to spurious fault detections during the vehicle wake-up process. The glitchy code can affect one or both taillights on affected models, but brake; reversing, and turn signal lights are unaffected.

Tesla began investigating after receiving warranty complaints for malfunctioning lights, but it is unclear whether substantially identical Tesla cars sold in Canada and elsewhere outside the United States are considered to be affected. This is the 19th recall campaign under which Tesla have recalled a total so far of over 3.7 million U.S.-market vehicles in 2022.

# Driver Assistance News

## Zvision Funding to Speed Lidar R&D, Commercialisation

### DRIVER ASSISTANCE NEWS



Zvision, founded in 2017, have successively launched and commercialised a series of MEMS lidar solutions covering long- and medium-range and large-viewfield needs. Now they're announcing they have completed tens of millions of US Dollars in series-c financing to be used for iteration of the company's automotive-grade lidar products; accelerate their self-research progress of core chips; expand production capacity, and generally promote the R&D and commercialisation process of automotive-grade MEMS lidar solutions.

# Luminar Lidar in Production Debut With SAIC, Volvo

## DRIVER ASSISTANCE NEWS



US-based automotive lidar specialists Luminar say their technology will equip Chinese automaker SAIC's new Rising Auto-branded R7 electric vehicle (photo). The announcement comes a week before Volvo are slated to unveil their EX90 EV which will include Luminar's Iris lidar system as standard equipment.

Luminar CEO Austin Russell says, "With the start of series production, autonomous technology has for the first time evolved from research and development into consumer production vehicles. The team and I couldn't be more proud to bridge that chasm with China's largest automaker and power what is set to be their most advanced and safest vehicle on the road".

Describing the latest accounting period as a "monumental quarter" for the company, Russell told investors Luminar are on track to hit all key milestones set for 2022, including the series production launch, and 60 per cent year-on-year growth in revenues. "We're breaking out of the pack of 'moonshot' R&D efforts, and into the first autonomous company that's delivering this capability into production consumer vehicles," he said. "We're now both in series production and launching with our first major automaker. In a world of over-promising and under-delivering for autonomous vehicles, we aim to be the standout that under-promises but over-delivers, [to] help make this industry happen, and [get it] into the hands of consumers".

Luminar's key priorities including scaling up production of their lidar systems at manufacturing sites in Mexico and Thailand, with CFO Tom Fennimore saying a final-assembly facility in Mexico should be ready to come on stream in the second half of 2023.

Luminar also will demonstrate a beta version of their new Sentinel software at the Consumer Electronics Show (CES) in Las Vegas early next year.

# New Xpeng P7 Has Optional Lidar

DRIVER ASSISTANCE NEWS



The new Xpeng P7 basically follows the design of the current P7 model, with some updates and adjustments. The front of the new car adopts the familial design cues, with a closed front face and separated headlamps—the inboard portion of which has been package-protected to save a place for the optional lidar.



The rear treatment echoes the front, with its own full-width light bar as an unibrow over taillights the same shape as the headlamps.

Founded in 2014 and headquartered in Guangzhou, Xpeng are one of China's leading electric vehicle companies. A number of models have been launched, including the P5; G3; P7, and G9. This past June, Xpeng Motors announced their cumulative delivery volume had exceeded 200,000 units.

# Valeo: 10 millionth front camera system

DRIVER ASSISTANCE NEWS



Last week, Valeo and Mobileye celebrated the production of Valeo's 10 millionth front camera system containing Mobileye technology, at Valeo's site in Wemding in Germany.

Valeo started its collaboration with Mobileye in 2015, choosing to integrate into its front camera system hardware and software the Mobileye system-on-chip (SoC), named "EyeQ".

Together, Valeo and Mobileye have combined their best-in-class technology and have developed and manufactured multiple generations of front camera systems. The strong collaboration between Valeo and Mobileye is now focused on the integration of the latest generation of the Mobileye SoC into the Valeo front camera system, and also into Valeo's cutting edge centralized computer and software.

At the heart of ADAS, the Valeo front camera system using the Mobileye SoC is making roads safer by supporting key features such as autonomous emergency braking, adaptive cruise control and lane keeping assist. The front camera system itself has become the key enabler in reaching the safety requirements defined by the authorities and is set to equip 100% of new cars. To date, since starting this activity, Valeo has produced nearly 13 million front cameras.

Marc Vrecko, President of Valeo's Comfort and Driving Assistance Systems Business Group said: *"We are very pleased to announce that we have reached this milestone, which clearly shows that Valeo is accelerating in ADAS, as set out in our Move Up strategic plan. By 2030, almost 90% of new vehicles will be equipped with this technology, and the ADAS content per vehicle will double."*

# TriEye 'SEDAR': Depth Sensing With SWIR Imaging

DRIVER ASSISTANCE NEWS



Trieye have launched what they call their 'SEDAR' platform, for spectrum-enhanced detection and ranging. The technology, developed with investment from Intel; Samsung, and Porsche, builds on TriEye's research into CMOS-based SWIR devices (short-wave infrared), an alternative to expensive InGaAs SWIR sensors.

SEDAR incorporates a SWIR light source and imaging sensor into the same device, enabling imaging and 3D mapping of the environment for vehicles as an alternative to the lidar systems currently employed by autonomous control systems and driver assistance features.

The platform was demonstrated at CES 2022 in Las Vegas, when the company agreed a collaboration with automotive parts supplier Hitachi Astemo as a route for SEDAR's adoption in ADAS and AV vehicle vision systems. And now TriEye have announced an official launch for the product and confirmed SEDAR will be on display again at the next CES this coming January.

CMOS SWIR sensors are meant as a way of expanding shortwave sensing into new markets and consumer applications—sectors where the cost of InGaAs sensors has slowed adoption. A CMOS-based SWIR device compatible with standard CMOS manufacturing workflows is expected to allow a considerably less expensive imaging system.

A recent market survey by Yole Développement indicated that the market for SWIR cameras is about to see significant expansion, from USD \$429m in 2021 to over \$4bn in 2027. A major boost should come from the use of 3D sensing modules in consumer applications, a sector expected to reach \$3bn and be largely facilitated by new sensor technologies.

# General News

## BYD Build Three-Millionth EV

GENERAL NEWS



On 16 November, BYD completed assembly of their three-millionth electric vehicle—becoming the first Chinese brand to achieve this milestone. BYD chairman and president Wang Chuanfu says, "From the first vehicle to the one millionth vehicle, BYD took 13 years; from 1 million to 2 million vehicles in 1 year, and from 2 million to 3 million vehicles in only half a year".



According to data from the China Passenger Car Association, this year from January to October BYD's cumulative sales reached 1.35 million vehicles, a year-on-year increase of 238.7 per cent, for a 30.7 per cent share of China's new energy vehicle market.

BYD entered the automotive industry in 2003, firstly in the battery business. Over nearly 20 years' development, they've developed a collection of key automotive technologies including motors; electronic controls, and chips. Through years of vertical integration and technological innovation, BYD have accumulated 26,000 global patents.

# Wuling Hongguang Mini is Top Local EV for Two Years Plus

GENERAL NEWS

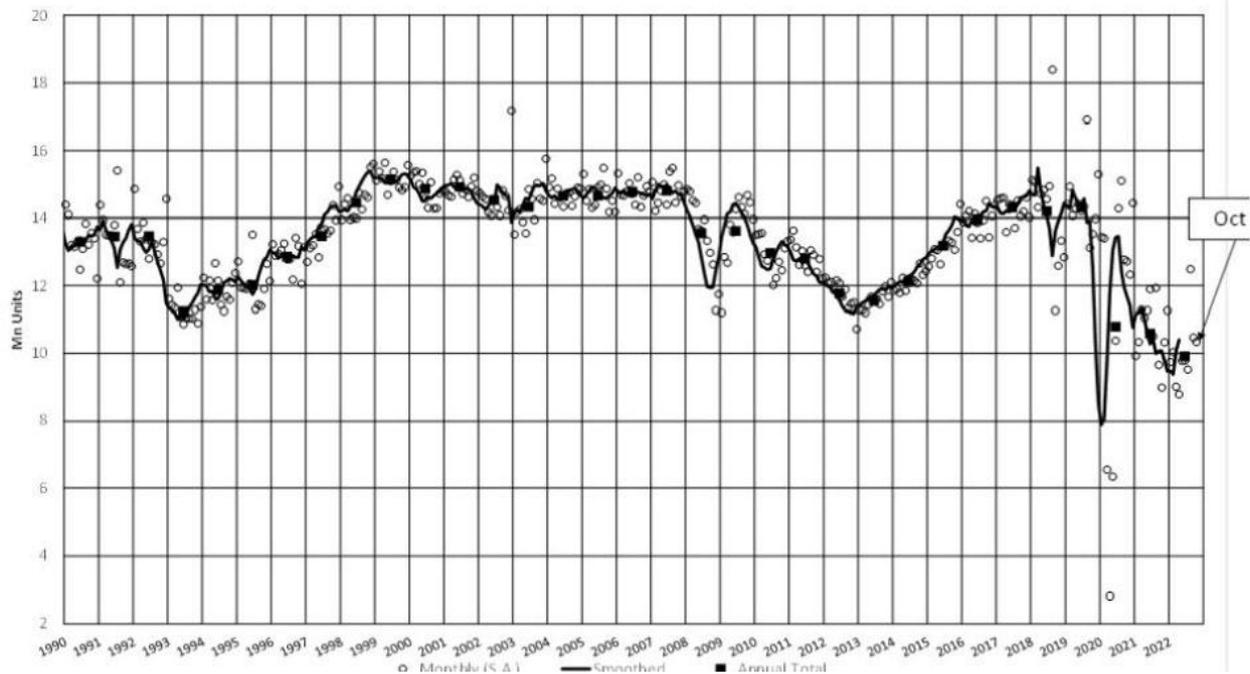


This month, Wuling Motors announced their Hongguang Mini EV has ranked № 1 in sales of Chinese-brand pure-EVs for 26 consecutive months—it sold 41,000 units this past October alone. Last week, new 'Macaron Colorful Model' and 'Macaron Painted Colour Model' variants were announced, with prices starting at €6,500.

These Macaron versions, launched this past April, have been upgraded in appearance, interior, and equipment. They include a standard driver airbag, reversing camera, and better seats. Two range options are offered: 120 or 170 km.

# Western Europe Car Market Soft Despite Sunny October

## GENERAL NEWS



WEST EUROPEAN CAR SALES, LMC DATA

Data from LMC Automotive shows the car market is weak in Western Europe, despite a year-over-year gain of 14.7 per cent in October against last year's low base for comparison. Although supply constraints continue to crimp the market, attention is now turning to the weak outlook for underlying demand.

According to the market data, the Western Europe annualised selling rate (SAAR) fell marginally from 10.5 million units per year in September to 10.3 million units per year in October. In raw monthly registration terms, October 2022 was up 14.7 per cent YoY to just over 820,000 units, though this still leaves the year-to-date result down 8.1 per cent. Highlights and lowlights of this past October:

- The German passenger vehicle sale rate fell slightly to 2.4m from 2.6m units/year in September;
- In the UK, the October rate of just under 2m units/year was up from 1.3m units/year in September.
- In France, the rate slipped, for the second month in a row, to 1.5 m units/year.
- In Italy, the rate remained flat at 1.4m units/year with YoY raw sales growth of nearly 15%.
- In Spain, the rate fell to 862k units/year in October, from just over 1m units/year in September, breaking a three-month run of increases.