Tue, 17 October 2023
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #825

Editorial

Lighting Skills To Boost Innovative Development

In this week's newsletter, you will discover information concerning two lighting suppliers. Ordinarily our focus leans more towards automakers and tier-1s, but tiers-2s are also playing a great part in the lighting ecosystem to help the development of innovations.

First example is Lumileds, one of the world's great leaders in LEDs. The Lumileds presentation shows that digital lighting is coming up everywhere, with small light sources at high luminance from standard wafer processes of 6", carrying 16,000 dies of µLEDs with a typical 1mm^2 chip size.

The second example is US-based Luxit, an active tier-2 supplier of subcomponents to the world's vehicle lighting setmakers, but also a tier-1 leader in small lamps and auxiliary lighting, a field which is actively developing and growing as automakers go for lit logos and emblems as well as welcome/farewell functions.

At the Shanghai DVN Workshop, you will have the opportunity to take in presentations by innovative tier-2s including Elmos, Gore, Shihu, Covestro, LMT, TechnoTeam, WLCSP, and AML Systems, and Light source suppliers including Appotronics; Lumileds; ams OSRAM; APT.
And that's on top of the ten automaker lectures and 11 tier-1 presentations, the regulation session, and the two panel sessions on ADB and on design.
Don't miss the opportunity; **sign up** today!

In Depth Lighting Technology

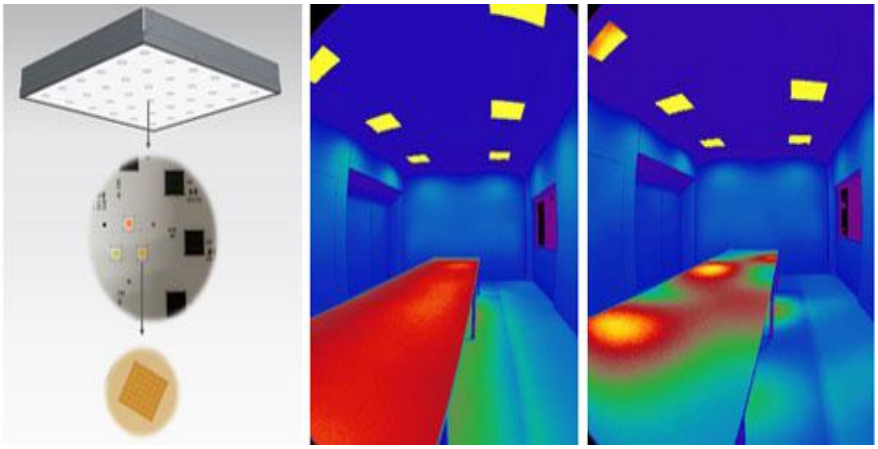
Breakthrough Lumileds Innovations Are Coming!

From left: Sunil Thomas, Jason Posselt, Brendan Moran, Wolfgang Huhn, Lars Dabringhausen, Oleg Shchekin

from Dr. Wolfgang Huhn, DVN Senior Advisor

Lumileds CTO Oleg Shchekin and VP of Operations Sunil Thomas, along with VP Marketing Jason Posselt and Technical Directors Brendan Moran and Lars Dabringhausen, gave DVN a presentation and window tour of their San Jose facility.

The presentation showed that digital lighting is coming up everywhere. Small light sources with high luminance give optical engineers ultimate design freedom, not only in the automotive sector. One very interesting use case is digital beam shaping for ambient lighting. Programmable 7 x 7 pixels in 6 x 6 patterns for general lighting allow software-controlled light color and illuminance exactly where it's needed (see below).

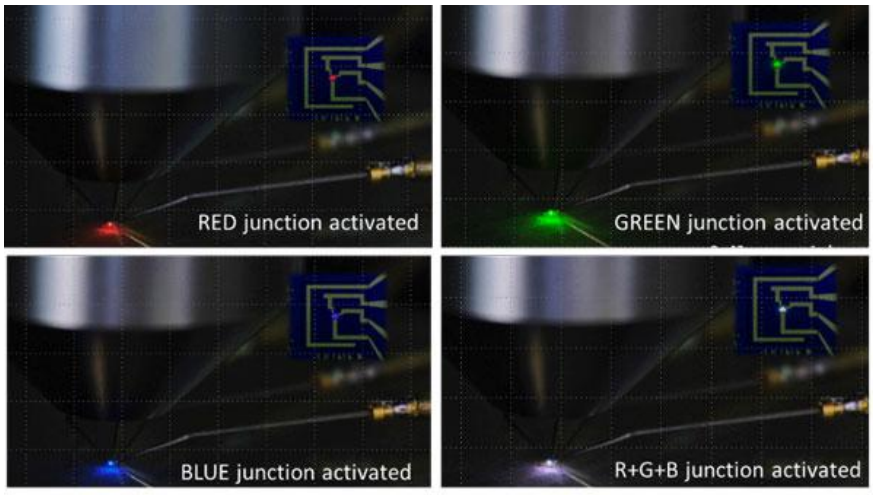


Luminaire concept demo for steerable beam shape illumination

Another successful related product is adaptive camera flash LEDs for mobile phones. With Lumileds' technology, it is possible to flash only parts of the scene when needed to enhance the photo.

During the tour, DVN learned that the building itself was built in 1982 as an HP factory, where high brightness AlInGaP LEDs were first developed and produced in the early 1990's. First of a kind automotive exterior application (rear applique) emerged in 1992, followed by CHMSLs and tail lamps. In the late 1990's also applied in traffic lights.
Historically all manufactured on 3" wafers; nowadays standard wafer processes are 6" or larger. Lumileds does all of its epitaxy in San Jose. The LED die wafer fab and backend packaging are in Asia, as is typical in the semiconductor industry. Impressive state of the art data are the hundreds of millions microLED dots placed on a single wafer, over 40 layers of InGaN epitaxial process with an overall thickness of 6 micron.
Today, each 6" wafer carries approximately 16,000 dies of high power LEDs with a typical $1mm^2$ chip size.

DVN was informed about the external quantum efficiency (EQE), the current density and the fact that especially red InGaN is a big challenge due to its relatively low EQE. But red is necessary for a Lumileds breakthrough: the Polychromic microLED pixel device - all colors in one single growth of InGaN! This brand-new polychromic technology breakthrough has the potential to disrupt the entire display industry.



Polychromic microLED pixel device

In the following, we toured two labs equipped with a remarkable number of microscopes of all sizes, where the next incredible technology steps were demonstrated, at least a part of it. DVN is not allowed to say more than that the future will be more transparent. Much more!

Thanks, Lumileds, for the great tour of some of the inner workings of what is normally a very closed area. I know from my colleagues that most visitors only see the meeting room.

Lighting News

Interview: Luxit Group, US Leader in Small & Auxiliary Lamps

LIGHTING NEWS

By Paul-Henri Matha, DVN COO

Luxit group was formed in January 2022, after a five-year period of company acquisitions. Core elements are Myotek, the tier-1 arm of the company, which manufactures lighting for vehicle makers all over the world; and Sealink, the tier-2 arm, which manufactures components and subassemblies for all of the major tier-1 lighting suppliers—mainly parts for headlamps and tail lamps.

In addition to Myotek and Sealink, Luxit Group acquired Hicks Plastics; Amptech, and Proper Pulaski to become fully vertically integrated. Being able to mould, metallise, apply hard and antifog coatings, manufacture electronics, and assemble in-house creates a competitive advantage and shortens time to market. There are five Luxit production facilities in the United States; two in China, and two in Taiwan. Later this year, an additional acquisition will be made in Juarez, Mexico, to ensure Luxit can support customers in the southern United States as well as Mexico. Luxit have also formed a strategic alliance partnership with Prettl Lighting & Interiors (PLI) for production in Europe.

The manufacturing facilities, particularly in North America, have been key to Luxit's growth by dint of onshoring activities. Due to the Covid pandemic; supply chain issues, and high tariffs, OEMs have been increasingly interested in supply localisation. Manufacturing in the same region that the vehicle is assembled reduces supply-chain risk and allows for greater local content.

In addition to the strategic growth of the global manufacturing footprint, Luxit continue to advance in terms of technical capabilities—embedded software design, validation, and verification for lighting with CAN-based communication, for example. This year, Luxit are launching a prime example of a product with communication via CAN-Bus protocol replete with authentication, OTA updatable animation, and fault reporting and logging capability.

This level of firmware development is resource-intensive compared to lamps previously developed, and is a critical step in maintaining Luxit's position as an industry leader.

As Luxit continue to focus on customer demand, emphasis is being placed on ensuring that small lighting continues to be a key element of the vehicle design and styling. They're the North American leader in small lamps and auxiliary lighting, and through growth and technological offerings they're striving to globalise that leadership position.

DVN COO Paul-Henri Matha took time after the DVN Workshop in San Francisco to visit Luxit's R&D office in Irvine, California, and to ask questions to sales and marketing VP Gene Spektor (photo, right; with Jonathan Gibney/Left and Paul-Henri Matha, centre)

DVN: With 1,000 employees; 10 plants, and $250m turnover, you have the critical size to tackle the future. Can you tell us how your Irvine headquarters location plays into that?

Gene Spektor: Irvine is the location of our technical center and where our VP of Engineering, Jonathan Gibney, is located. We develop our electronics, run DV testing, and have prototyping capabilities in Irvine. In addition to the West Coast location, we also have engineering located in Central Ohio and China, as well as at our Headquarters in Farmington Hills, Michigan (near Detroit). Having our engineering group in these various locations allows us to serve our customers and our plants more effectively. In total, we have approximately 23 engineers supporting the organisation.

DVN: How does the future look for fog lamps, in your view? The trend in Europe is to replace fog lamps by AFS functionality in the headlamp, but AFS is not allowed in the USA.

GS: While you are right that Europe is starting to see a trend of fog lamp removal, we are seeing an exact opposite trend in North America. Our customers are continuing to add fog lamps as both a functional as well as a design element. Small lighting continues to expand both in and around the car with lit emblems, welcome lighting, puddle lamps, ambient lighting, etc. While one type of lamp may be reducing in one region, the overall growth of small lighting continues to expand.

DVN: What kinds of fog lamps are trending on this continent?

GS: For the most part, all fog lamps have migrated to using LEDs. There are still a few exceptions to this, but those are limited cases. The fog lamp continues to evolve and is really vehicle design driven. There are still many round fog lamps in the market, but the linear design is becoming more commonplace. As the automaker studios continue to evolve the design of the vehicles, the fog lamps will evolve as well.

DVN: Sealink are well known for their magnesium technology which saves a lot of weight in lamps. What's the status of that technology now? How does it factor into your vertical integration?

GS: Being vertically integrated gives us a competitive advantage in terms of being able to better control our costs as well as a shorter time to market. We strongly believe that this is one of the key points that sets us apart from others. In terms of magnesium technology, aside from the weight savings which is a key benefit that helps to improve overall CO_2 emissions, magnesium has superior vibration-damping properties, excellent EMI and RFI shielding, and is 100 per cent recyclable! Given its high rate of heat transfer, magnesium can reduce the number of parts in a lamp by combining a structural bracket with a heat sink which helps with weight savings, tolerance stackup, and reduces the overall complexity of the part. We are currently producing magnesium heat sinks as well as integrated brackets in our facility in China for the global market.

DVN: Automakers' electrical platforms are requesting CAN, UART, or Ethernet. How does that shape the work of your R&D team and your manufacturing process?

GS: Developing multi-mode lamps with communication has a significant impact on R&D resource load. Beyond firmware design, debugging, and functional verification checks, embedded software drives the need for additional manufacturing process controls and end of line quality checks.

DVN: With your new Prettl partnership, Luxit are now a worldwide tier-1. What sorts of business do you target? What is the maximum size of lamp you can produce?

GS: Our relationship with Prettl is a strategic alliance. We currently don’t have a production facility in Europe, and they don’t have production in the US or China. The agreement would be to work on global small-lamp platforms together where Luxit would produce in US and China and Prettl would produce in Europe. We are looking at all small lamps on the exterior and interior of the vehicle; basically, everything except headlamps and tail lamps.

DVN: What opportunities do you see for growth?

GS: Small lighting continues to develop and grow. More and more automakers are implementing lit logos and emblems as well as 'welcome and goodbye' functions that are typically activated with a key fob or proximity key. In addition, as we move toward more ADAS functionality, the interior of the car is turning into a living room. With that, people are expecting different ambient and mood lighting that did not previously exist. We see great opportunities going forward!

Sample Luxit products:

Jeep Grand Cherokee Summit

Jeep Grand Cherokee SRT and Dodge Durango

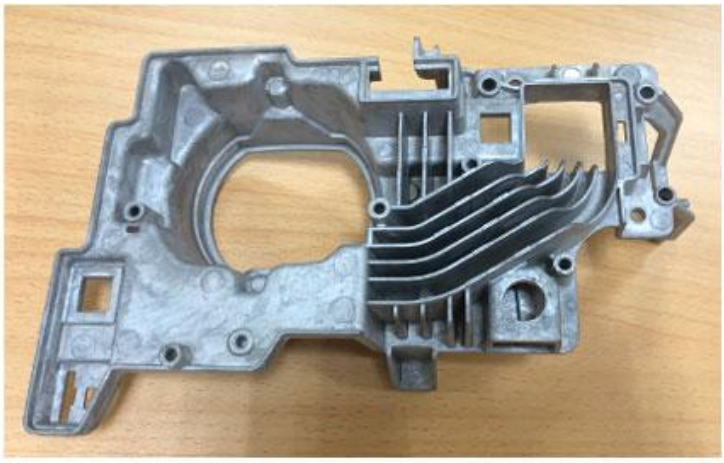
Jeep Grand Wagoneer Premium

There are several versions of this lamp, used on vehicles including the Jeep Cherokee, Jeep Grand Cherokee, Jeep Compass, Dodge Charger, and Ram Truck.

Ram Promaster

Magnesium heat sinks and integral brackets

DODGE CHARGER

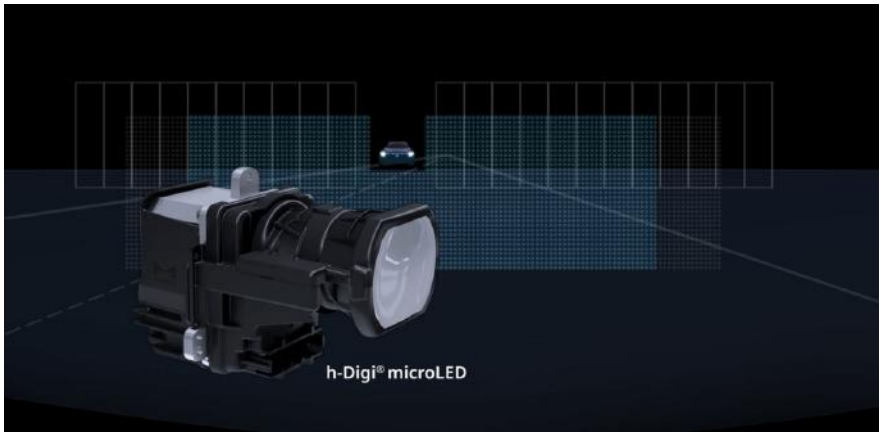


BUICK ENCLAVE

Marelli h-Digi® microLED Headlamps in New VW Touareg

LIGHTING NEWS

Marelli’s new high-resolution 'three-eye' headlamps for the top version of the VW Touareg use the supplier's novel h-Digi® microLED platform module. The three-eye style desired by VW was accomplished by the interaction of three modules: h-Digi® microLED, a 16-segment matrix standard module, and a bending light module.



Marelli h-Digi® microLED module with ams OSRAM's Eviyos® 2.0 light source

The h-Digi® microLED module is based on a matrix illumination system with around 40,000 LED pixels (almost 20,000 per lamp). The LEDs are selectively modulated to create very flexible low-beam and high-beam light distributions, adapting to various driving situations including dynamic curve light and ADB. It also can project warnings or driver assistance images on the road, directly in the driver’s field of view.
The Marelli microLED system is based on ams OSRAM's new Eviyos® 2.0 light source. In combination with a special optical system and a new electronic control engineered by Marelli’s Automotive Lighting & Sensing division, it enables an enhanced level of adaptability of the illumination field. This is the first time LEDs with a size of 40 × 40 µm are introduced as pixel elements in vehicle headlamps.

Hella SSL|HD Matrix Headlamps in New Porsche Cayenne

LIGHTING NEWS

Hella have just launched the first production headlamp—optional on the Porsche Cayenne—featuring their high-definition solid-state lighting matrix technology. It is a revolution in LED matrix systems, with over 32,000 individually controllable LED pixels per headlamp.

Porsche's body lighting and vision systems director Robert Haehle and lighting modules and regulations manager Benjamin Hummel gave a presentation on this headlamp at the DVN Workshop in Paris this year. In it, they explained how Porsche use bifunction modules combining ground illumination and additional high beam. The functionalities are obtained with the segmented ground illumination, with the brightness of the centre and side areas continuously adjustable. Overall light performance is very high: more than 2,500 lm and peak intensity of 187,500 candela.

The µLED system is based on 256 × 64 pixels, so 16,384 LEDs with a pixel pitch of 50 × 50 µm, and an integrated driver. The main functionalities are:

- Low-; town-; country-; highway-; fog-, and rain-optimised beam patterns with swivelling light; static cornering light, and other-side-of-the-road travel mode;
- A performant set of high beam functions: glare-free high beam; adaptive highway high beam with a dynamic safety zone; glare-reduction of road signs;
- Driver information with lane light; construction zone light; oncoming traffic / passing light, and marking light
- Welcome/farewell animations.

After Lippstadt this year, Hella intend to launch production in Hella lighting plants across China, Mexico, Czechia, and Slovakia in the coming years.

Volvo EX90 Shines with Unique ZKW Headlamps

LIGHTING NEWS

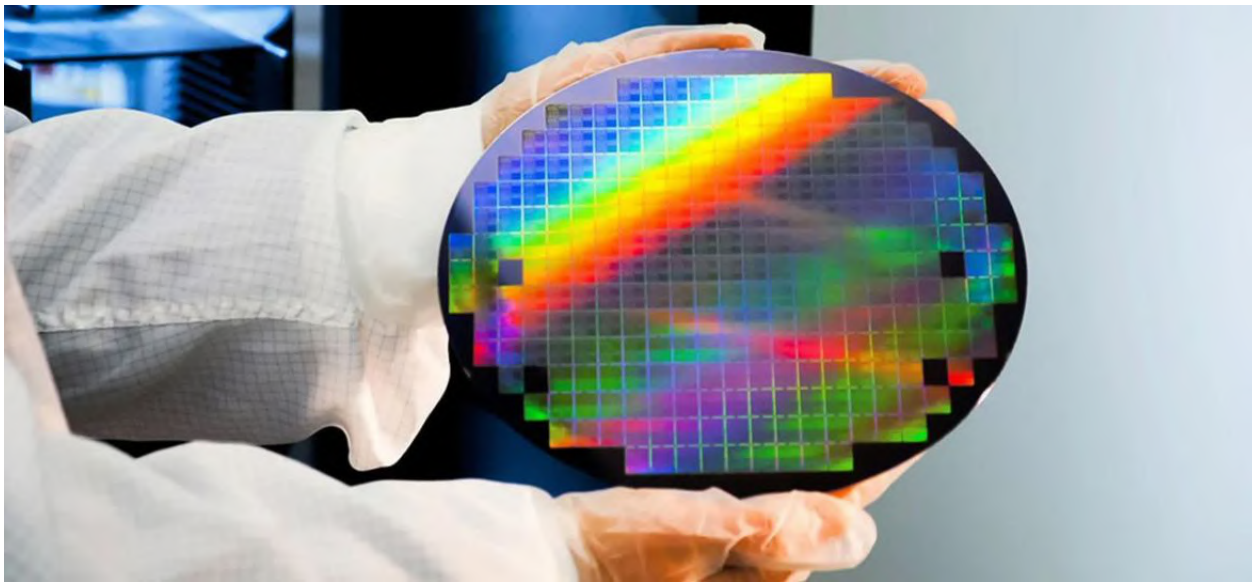
ZKW equips the new Volvo EX90 electric SUV with some seriously classy headlamps. They contain a digital HD light module with over 1.3-megapixel resolution, which create a precisely-controllable light image on the road. The high-tech lamp adapts dynamically to the traffic and precisely shadows out other road users. The daytime running lights shine in the 'Thor's hammer' Volvo brandmark. When the headlamps are switched on, the horizontal bar (the 'hammer handle') of the daytime running light splits open to reveal the main headlamp.

The LED light elements of the DRLs form the hammer-shaped design, with the head divided into six light segments, while the stem is formed by ten other elements. Switch on the headlamps proper, and the hammer handle splits to expose the main headlamp optics. The movement not only serves to switch from daytime running light to main light, but also underscores the vehicle’s start sequence with a 'wink' of the headlights. ZKW CEO Dr. Wilhelm Steger says, "This animated light function is unique and only available from Volvo”.

As the basis for the headlamp, ZKW use a 'Segment Light' module that combines matrix high beam and low beam. The DRL, movable by dint of innovative kinematics, gives the SUV a unique appearance. When the vehicle is unlocked, the individual headlight elements flash one after the other before flipping open to reveal the headlight with a flashing effect. The lamp was developed at the ZKW site in Wieselburg and is manufactured at ZKW in Silao/Mexico and Dalian/China.

French µLED Maker Aledia Raise Funds, Name CEO

LIGHTING NEWS



MicroLED pioneer Aledia, located in Grenoble, France, have appointed Pierre Laboisse as CEO and raised €120m in funds from existing backers, according to state-owned investor BPI France. Laboisse was previously an executive VP at ams OSRAM; he replaces Giorgio Anania, who remains on the company's board of directors.

Aledia were spun off from French research institute CEA-Leti in 2011 to develop 3D microLED technology based on gallium nitride nanowires fabricated on large-area silicon wafers. The Aledia technology is currently implemented on 200-mm silicon wafers and will evolve towards 300-mm wafers for high-volume production.

In 2019 Aledia began construction of a 4,000-m^2 pilot fab in Echirolles, near Grenoble, for the production of nanowire LEDs on 200-mm wafers with a project cost of €20m. Then in 2020, Aledia chose Champagnier (also near Grenoble) as the location for a €50m mass-production wafer fab.

The €120m in funds comes from long-term shareholders in Aledia, including CEA Investissement, Supernova Invest, and the SPI and Ecotechnologies funds managed by BPI France, a state-owned public investment bank.

Rainer Neumann to Chair December Conference

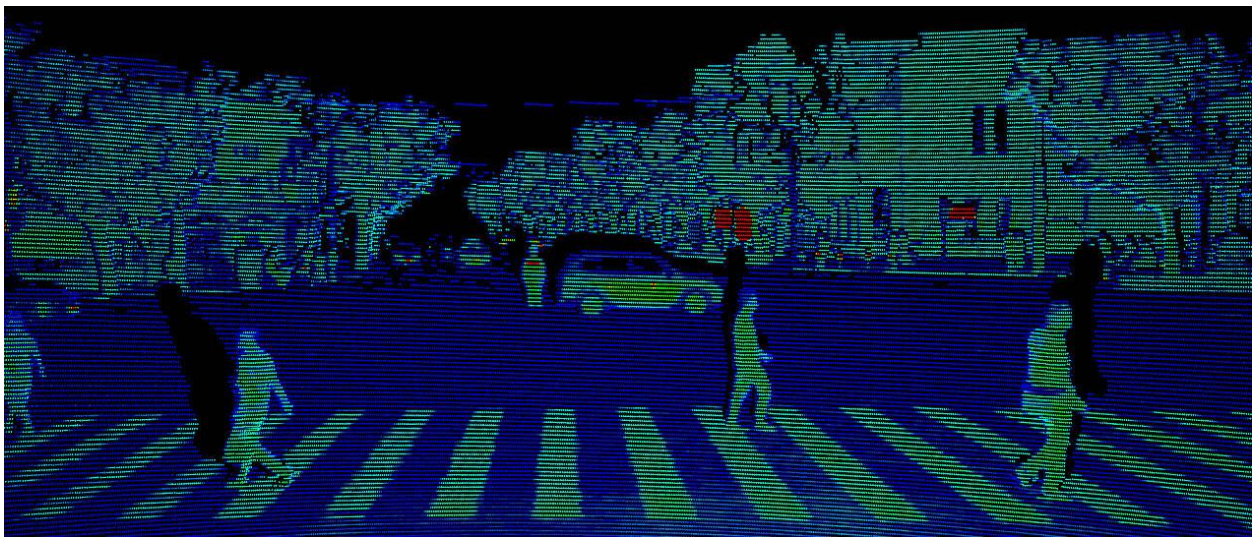
LIGHTING NEWS

Vehicle lighting rockstar Rainer Neumann is holding a small German-language one-day lighting conference on 12 December at the Novotel Am Tiergarten Berlin. The conference is about environmentally-friendly concepts and strategies for vehicle lighting.
Speakers will be Rainer Neumann himself; Claus Allgeier; Stephan Berlitz; Michael Hamm; Wolfgang Huhn; Jörg Kälble; Dirk Meyer; Ernst-Olaf Rosenhahn; Christian Schmidt; Ralf Schäfer, and Helmut Tiesler-Wittig representing the German automotive lighting industry.
Find more information about the conference **online**.

Driver Assistance News

International Trade Commission Ends Lidar Patent Infringement Suit

DRIVER ASSISTANCE NEWS



The International Trade Commission has terminated a patent infringement suit by an American lidar maker against a Chinese competitor, but the case will continue in U.S. federal court.

San Francisco-based Ouster sued Shanghai-based Hesai Group in April, seeking to bar Hesai from importing certain autonomous-vehicle technology to the U.S. The ITC did not address the merits of Ouster's claim. The ruling lifts a stay on a federal suit Ouster filed in U.S. District Court in Delaware seeking an injunction and monetary damages against Hesai.

The ITC initially determined this past August that the claim should be terminated. Hesai, in a statement, said, "Hesai has always believed all of Ouster's infringement allegations are baseless and lack merit. Hesai's lidar products are independently developed, based on years of research and engineering investment, not stolen IP".

The ITC decision allows arbitrators time to decide whether Ouster must arbitrate based on a 2020 patent infringement settlement between Hesai and Velodyne Lidar. Ouster purchased Velodyne in February. Ouster claimed it was not bound by the previous patent cross-licensing agreement Hesai reached with Velodyne following a suit Velodyne filed in 2019 against Hesai and Suteng Innovation Technology, also known as RoboSense. Hesai agreed to pay Velodyne millions in upfront payments and ongoing royalties. Velodyne sued Ouster alleging patent infringement in June 2022. That case went away when the two startups announced their merger in November.

Hesai claimed Ouster has spent $800,000 since last year on lobbying to smear Hesai.

In a statement following the ITC's initial determination, Ouster said they invented digital lidar technology, hold one of the largest patent families in the lidar industry, and that after the market shifted toward digital lidar, Hesai stole Ouster's patented technologies and incorporated them into Hesai's competing products.

General News

Supplier layoffs grow as UAW strike continues, survey shows

GENERAL NEWS

A new MEMA survey found that 39% of suppliers have laid off workers. That figure could rise to 70% by month's end.

About 39 percent of parts suppliers surveyed by the Motor & Equipment Manufacturers Association this week said they have laid off workers because of the UAW strike against the Detroit 3.

That's a higher figure than the association reported in its previous survey two weeks ago, when around 30 percent of respondents said they were forced to lay off workers. It is unclear if the layoffs are limited to the U.S.

And according to the survey, the figure will surge by the end of the month.

The group conducted the new survey last week.