DrivingVisionNews.com
Automotive lighting and driver assistance technologies

Fri, 5 March 2021 Weekly Newsletter NEWSLETTER #688

Editorial

The Tall Challenges Of VISION 2021

The VISION 2018 congress was highly satisfactory: The congress had taken place in an admirable manner with 27 exhibitions, 31 conferences, a panel discussion bringing together the greatest experts, and above all more than 600 participants from 24 countries on four continents—a growth of more than 20%. It was a terrific success, and the target for the subsequent 2020 congress was very ambitious, to build on that growth.

Then came the pandemic and forced a change of plans. But the ambition remains the same, even though the congress was shifted from an in-person Autumn 2020 event to an online event happening the 17th and 18th of this month, a little over two weeks from now So how does that work? How do we keep our targets and goals despite such a major shift? Here's how: We carefully adjusted the time schedule of the program to allow participants all over the world to follow the congress as conveniently as possible—we will start later in the morning and will stop earlier in the afternoon, from the European perspective. We've made the conference in two parallel sessions to avoid conflict in the lectures.

We've enticed Marie Gautier-Melleray, the French Interministerial Delegate for Road Safety, to open the congress together with future Valeo CEO Christophe Perillat. We've organised a panel discussion to talk about challenges, benefits, and drawbacks of sensor integration into headlamps and front ends, with four top experts: Stellantis ADAS research and innovation expert Matthieu Dabek; Valeo ADAS CTO Joachim Mathes, Volvo Cars Exterior Lighting Technical Leader Paul-Henri Matha, and Marelli Automotive Lighting's Andrea Stella, VP of Research and Development.

And—best of all—we've convinced all the originally-scheduled speakers to present their lectures as expected! So our ambitious targets are the same, and we fully expect to meet them with a grand, successful VISION 2021. We'll (virtually) see you there!

Sincerely yours

In Depth Lighting Technology

Speed of Light

Special to DVN by Ralf Klaedtke, former ZKW R&D Director

In a vacuum, light always travels at the same speed: exactly 299,792,458 m/s. For most space objects, we use light-years to describe their distance. A light-year is the distance light travels in one year, about 9 trillion km. Earth is about 8.3 light-minutes away from the sun.

About a year ago NASA scientists announced they had found the first Earth-sized, potentially habitable planet. That planet, currently known as TOI 700 d, is about 100 light-years away from Earth. It is orbiting a star that is about 40 percent of our sun's mass and size.
Light emitted by the sun of TOI 700 d in Earth year 1921 is arriving on Earth now, in the year 2021. How has automotive lighting evolved since then?
When light started to travel back in 1921 from the sun of TOI 700 d, electric headlamps had become an industry standard among auto manufacturers. Headlamps were also now required to beam specific amounts of light, and only in specific directions. To better fulfill these requirements, engineers incorporated high and low beams into headlights.

369 trillion km further in our travel—back in 1962—European automakers unveiled the halogen car light. With its ability to produce a richer quality of light without using extra power, the halogen light became popular throughout Europe due to its brightness and durability.
630 trillion km further along, in 1991, the first Xenon headlights were introduced. Xenon lights were popular for their brightness, durability and energy efficiency. (though today's LED lights last for periods that far exceed the life expectancy of halogen lights and emit strong levels of brightness with much lower energy consumption).
837 trillion km further, in 2014, laser headlights were introduced to challenge LEDs by offering a 600-metre range, about twice the distance of LED high beams.
In 2017, 864 trillion km along in, technologies for vehicle lighting are taking quantum leaps in capability. The new Digital Mirror Device chipset features over 1.3 megapixels in each headlamp enables seamless execution of ADB (adaptive driving beam) systems, which enhance safety for the driver and oncoming traffic by maximising the driver's visibility while cutting glare to oncoming traffic.

After 900 trillion km, light from TOI 700 d arrives on Earth, where vehicle lighting is evolving at what seems like the speed of light to master an incredible variety of technologies like DLP, MicroLED, OLED, LCD, LCoS, and MLA…in combination with visual, infrared, and laser scanning sensors detecting and classifying objects like cars, bikers, trucks, and pedestrians. Vehicle lighting supports sensors and artificial intelligence to detect and classify objects in front of the car, and provides a significant contribution to safety. Ground projections allow dynamic, contextually relevant safety signs like an icy-road snowflake warning or width guidelines to help the driver through a tricky stretch of road narrowed by construction.

In addition to functionality and contribution to safety, vehicle lighting has become a key to the design of every carmaker. Light animations inside and outside of the car are a must, and not only for premium carmakers. Lighting design creates emotion and wow-effect for car enthusiasts.

As automotive lighting is evolving at the speed of light, lighting regulations around the globe seem to suffer from relativistic effects. If we drove a car with governmental regulations behind the steering wheel close to the speed of light relative to the ground, and turn on our headlights, light would leave our headlights at the same speed as always, the speed of light. However, for us being at rest on the ground, the governmental-regulations frame of reference moves close to the speed of light relative to our rest frame. Accordingly, governmental-regulations time slows down as observed by someone in the rest frame. This relativistic effect is known as time dilation. Our challenge is now to make sure that relativistic effects are avoided in governmental regulations, for the sake of safety of all participants to traffic and the future and speed of vehicle lighting evolution.

Lighting News

Oliver Hoffmann is New Audi Tech Development Chief

LIGHTING NEWS

Oliver Hoffmann, only 44 years old, will head Audi’s Technical Development. CEO Markus Duesmann has been realigning Technical Development, fulfilling two roles since last june with particular focus on process quality.
Dr. Herbert Diess, Chair of Audi's Supervisory Board, says Hoffmann "is an accomplished engineer with the right leadership qualities to head up the technical heart of this premium brand".

Thanks to his work in Neckarsulm and subsequently as Chief Operating Officer, Hoffmann is a familiar face and leader to Audi's development team of ten thousand people. In recent months, he has reorganised the structure of his division and has devoted himself with passion to establishing the new corporate culture.

Duesmann says Audi are currently in the midst of a double transformation: technologically, pursuing their roadmap towards e-mobility and digitalisation; and as a huge team, working towards agile, trust-based collaboration.

Hoffmann has proved his technical expertise in quality assurance at Lamborghini, in Neckarsulm, Germany, and at the world's largest engine plant in Győr, Hungary. Having spent several years heading Powertrain Development in Győr and later in Ingolstadt, he joined Audi Sport in 2017 as Head of Technical Development, where he was appointed Managing Director in 2018. In 2019 he took on two further management roles: Head of Technical Development at the Neckarsulm site, and Head of Powertrain Development for Audi as a whole. Since last June he has been Chief Operating Officer of Technical Development. His office is located in the same buiding where the light tunnel has been built undergound. Probably a good chance for the Audi lighting team!

Martin Enenkel appointed CEO of Docter Optics SE

LIGHTING NEWS

The Supervisory Board and the management of the Docter Optics Group are setting the course for the future.

Effective March 1, 2021, Martin Enenkel (52) will be appointed Chief Executive Officer (CEO) of the Group.

After his apprenticeship as an electrician and the completion of his engineering studies in optoelectronics at Aalen University of Applied Sciences in 1996, Martin Enenkel consistently engaged himself in well-known German industrial companies in optoelectronics, sensor technology and lighting technology.

This included almost 20 years of work for Phillips Technology GmbH and Vosla, where he held various strategic and management positions in R&D, product and innovation management as well as marketing and sales. A 3-year stay as Product Marketing Manager NAFTA in the USA in the automotive city Detroit, Michigan was also part of his professional career.

Most recently, Mr. Enenkel contributed his in-depth expertise and acquired skills as VP & Head of Strategic Business Unit Industrial Solution at Jenoptik AG (Optical Systems GmbH). His responsibilities there included industrial automation, safety & security and automotive. He thus brings with him industry and management experience that is a perfect fit for Docter Optics.

"As a trained optoelectronics engineer, I firmly believe in a secure future and in the further development of optics in strategic focus markets, even outside Docter Optics' current core business. With Docter Optics' expertise, exceptional customer reputation and with the help of the qualified team, I would like to continue to lead the company to profitable growth," said Martin Enenkel.

Toyota Yaris wins "The Car of the Year 2021" award

LIGHTING NEWS

The Toyota Yaris is “The Car of the Year 2021”. It was Europe's number1 seller in January 2021 with a volume of 18,000.
The award ceremony took place in Geneva on Monday, March 1, 2021 and was streamed live on the website of the Geneva International Motor Show, whose team hosted the ceremony for the tenth time in a row.

A jury of 59 automotive journalists from 22 countries selected the winner from seven models that managed to join the group of finalists in the first round. By winning the trophy "The Car of the Year 2021", the Toyota Yaris is presented with the most prestigious and coveted award in the automotive world, which has been awarded since 1964.

This year, the election took place under special conditions. Like 2020, the ceremony was not held as the inaugural event of the Geneva International Motor Show (GIMS) press days, but only streamed live on the internet. And like last year, the organizers of "The Car of the Year" called on the expertise and experience of the GIMS team.

The results of the seven finalists for "The Car of the Year 2021":

Toyota Yaris: 266 points
Fiat New 500: 240 points
Cupra Formentor: 239 points
Volkswagen ID.3 .: 224 points

Škoda Octavia: 199 points
Land Rover Defender: 164 points
Citroën C4: 143 points

One LED for Two Functions in New Mobis Tail Lights

LIGHTING NEWS

Hyundai Mobis have a new kind of LED that’s able to be bent as a thin film. The design allows a single LED to serve as both a stop lamp and a tail lamp, requiring only 5.5mm thickness for the LED surface. The new tail lamp is called HLED.

The system can generate a bright and uniform stop light function even when it's bent, by emitting light from five different directions. The result is a rear lamp more visible to drivers at a wider range of angles. The system also facilitates various lamp designs since it can be bent or curved as needed.

HLED also offers lighter weight because it removes internal components used for existing rear lamp systems, and just uses the LED alone. Hyundai Mobis say it has passed reliability tests in Europe and America, and that they have received orders from European automakers; as a result, the HLED has already entered mass production.

IIHS Highest Grade Count Doubles Despite Tougher Tests

LIGHTING NEWS

The number of vehicles earning the U.S. Insurance Institute for Highway Safety's highest "Top Safety Pick +" grade more than doubled for 2021 models, even as the criteria grew stricter.

49 vehicles received the top mark this year, compared with 23 vehicles in 2020. Another 41 vehicles earned the second-best Top Safety Pick designation, bringing the total number of winners to 90, compared with 64 last year.

To qualify for a Top Safety Pick award, vehicles must have "good" ratings in all six of the institute's crashworthiness tests, must have front-crash avoidance features rated "advanced" or "superior", and and must be available, even if the availability is restricted and optional, with "good" or "acceptable" headlamps. The uppermost Top Safety Pick + mark is awarded to models that meet those requirements and also have "good" or "acceptable" headlamps as standard equipment across all trim levels.

Headlight ratings were first incorporated into the TSP+ criteria for the 2017 award year. To qualify for the highest award, vehicles at that time had to at least have good or acceptable headlights available as an option. The following year, that requirement became part of the TSP award as well.

As manufacturers showed they could produce headlamps with better lighting and less glare, IIHS decided to encourage them to make this improved equipment standard. Starting in 2020, only vehicles with good or acceptable headlights as standard fitment could earn the TSP+ award.

An IIHS representative says "The strategy seems to be working. A year ago, only 23 vehicles qualified for the higher-tier award. Today, the number has more than doubled, and the majority of awards handed out for 2021 models include the plus sign".

New Dajac Controller Boosts Aim, Validation Control

LIGHTING NEWS

Dajac Inc.

The Lamp Controller is a new addition to Dajac’s Osprey line of lighting alignment and validation systems. Based on Dajac's IntelliAim software, the new Osprey Lamp Controller focuses on controlling vehicle lighting.

The tasks pane presents a palette of available tasks that can be arbitrarily added and arranged in the script pane for optimum control. The script can be configured to control the flow of the process in conjunction with the machine. Using the powerful scriptable CAN, LIN and Modbus TCP interface, even highly intricate, complex processes can be implemented easily.

For those lamps that require it, all profiles of Autosar E2E are configurably supported for CAN
communications.

Dajac, founded in Indiana, USA in 2000, design and manufacture equipment to align and validate lighting in lamp manufacturing, vehicle assembly, quality assurance and lighting laboratories.

ZKW's Drive Light & Sight Competition: This Year's Winners

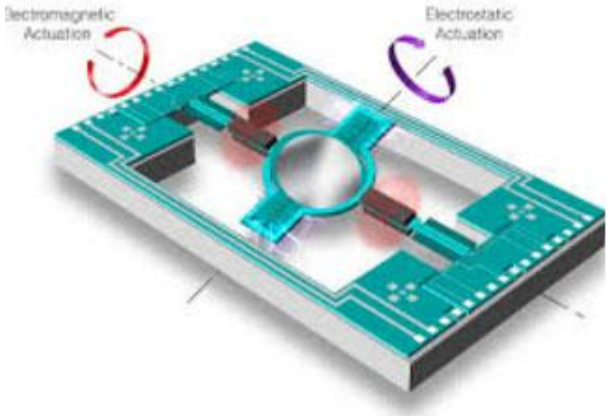
LIGHTING NEWS

ZKW searched for startups offering innovative solutions in the areas of sensors and auxiliary lamps in their Drive Light & Sight Challenge. 74 applications submitted from 25 countries were assessed by the ZKW jury, and a young company called Flite have been chosen as a winner for their new surface finishing method for headlamp lenses, alongside the startup Maradin, with their micro-laser projector for dynamic lighting systems. Each of the winners will receive €15,000 in prize money, along with a place in the ZKW Partnership Program. The winning concepts will now be implemented in practice alongside ZKW's innovation experts. ZKW CEO Oliver Schubert says "Collaborating with startups is an important part of our innovation strategy, and is key for developing future lighting and sensor systems. This maximises safety for all road users in the age of autonomous driving".

Hydrophobic surfaces

With their new surface finishing method, Canadian startup **Flite** have developed a technology that gives surfaces made of different materials hydrophobic properties. The solution is inspired by the natural model of a lotus leaf, which has a microscopic, rough surface texture that repels liquids. Flite achieved the same effect using a pulsing laser to engrave a special texture into material surfaces. ZKW are currently researching this technology as a supplement to surface coatings used on headlamp lenses.

Communicating with laser light



Vehicle networking and communication with other vehicles and with other road users like pedestrians and cyclists is key to AVs. Israeli startup Maradin are using a micro laser projector that can be integrated at different positions on the vehicle, such as in the side mirrors.
It can be used to project warning notices on the roadway, or to display information to the user when they approach the car, such as regarding the charge status/fuel level. The concept allows for dynamic laser light animations that can communicate information and provide increased safety at night for all road users.

Mercedes Maybach GLS 600 Glitters With Glitzy Lights

LIGHTING NEWS

The relaunch of Maybach as a hyperluxury Mercedes sub-brand has been aided and abetted by top-specification lighting, inside and out. The Maybach GLS 600, for example, is a luxury variant of the Mercedes GLS, and it's got fancy lights throughout.

When the owner approaches the vehicle in the dark, they are greeted by a projection of the Maybach logo and an automatically extending running board. Ambient lighting in the dashboard, centre console, door panels and even seatbelt buckles makes a design

statement, intensifies spatial perception, enhances perceived interior quality, and makes drivers feel safer.

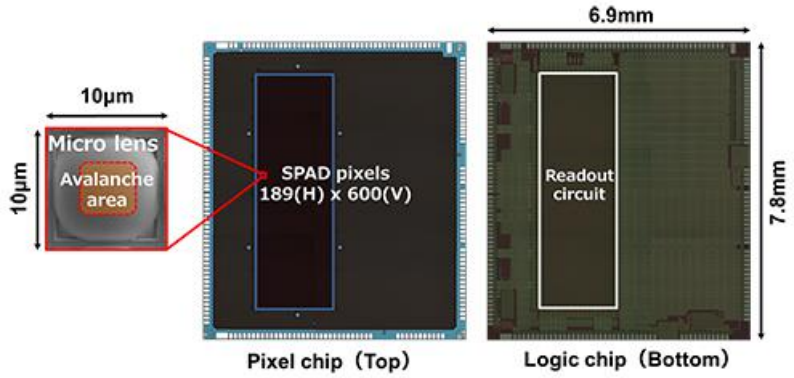
Car makers like Daimler or the Volkswagen Group integrate safety assistance systems with interior lights. For example, if a car or cyclist is approaching the stationary car the vehicle can rapidly flash red interior lights on a door panel strip to warn its drivers and passengers to stop and look carefully before flinging open the door.

Driver Assistance News

Sony's Stacked Direct ToF Depth Sensor for Lidar

DRIVER ASSISTANCE NEWS

Sony have a new stacked dToF (direct time of flight) depth sensor for automotive lidar, using SPAD (single-photon avalanche diode) pixels.



SPAD is a pixel structure that uses avalanche multiplication to amplify electrons from a single incident photon, causing a cascade like an avalanche, and it can detect even weak light. It is possible to accomplish long-distance, high-precision distance measuring by employing SPAD as the detector in a dToF sensor, which measures the distance to an object based on the ToF of a light emitted from a light source until it returns to the sensor, after being reflected by the object. Sony's application enables high-precision, high-speed measurement at 15-centimetre range resolutions up to a distance of 300 m.

The new development will help enable detection and recognition under severe weather conditions as required for automotive equipment, thereby contributing to greater reliability for lidar, and the single-chip architecture helps drive down lidar system cost.

Sony also have developed a MEMS lidar system equipped with this new technology for evaluation purposes, Compared with through-silicon via (TSV) wiring, where the connection is achieved by electrodes intruded around the circumference of the pixel area, this method gives more freedom in design, improves productivity, allows for a more compact size, and increases performance.

Mobileye-Transdev-Lohr Pact for AV Shuttle Fleets

DRIVER ASSISTANCE NEWS

Mobileye have started a strategic collaboration with Transdev, a private operator of public transport, and the Lohr group, who manufacture transport vehicles.
The companies will integrate Mobileye's autonomous driving system into the iCristal electric vehicle, manufactured by Lohr, with plans to integrate it into public-transport autonomous shuttle fleets around Europe.

Commercial services will be set up and autonomous shuttles will be deployed for a test program starting next year in France; wider European service is expected a year later.

The Lohr iCristal can accommodate up to 16 passengers and is fully accessible via a ramp. The shuttle can travel at speeds of up to 50 km/h. Mobileye's autonomous driving system is based on two technologies that include decisionmaking software and a perception system of cameras, radars, and lidars to make the vehicle see its surroundings.

The autonomous driving system can also be deployed without geographic limitation using Mobileye mapping technology for AVs, whereby a proprietary and participatory AV map of the global road network is created and then continuously updated.

Transdev are jointly owned by Caisse des Dépôts (66%) and the Rethmann group (34%). In 2019, the company had 85,000 employees in 18 countries and parent company the Transdev group generated total revenues of €7.4bn.

The Lohr Group design, build, and sell passenger and freight transport systems. They have six factories on three continents, 2,000 employees, and an R&D centre.

AEye to Go Public Via Merger

DRIVER ASSISTANCE NEWS

AEye and CF Finance Acquisition have entered into a definitive merger agreement. The combined company will be called AEye Holdings, and publicly listed on Nasdaq. The proposed transaction will expand AEye's technology leadership and accelerate the adoption of their active, high-performance lidar systems and components.

The transaction, expected to close in the second quarter of this year, will firstrequire the approval of CF and AEye stockholders as well as relevant regulators. It is expected to deliver up to $455m of gross proceeds, including the contribution of up to $230m of cash held in CF trust account. The transaction is further supported by a $225m fully-committed PIPE anchored by strategic and institutional investors including GM Ventures, Subaru-SBI, Intel Capital, Hella Ventures, Taiwania Capital, and other investors.

AEye's "IDAR" (Intelligent Detection and Ranging) platform involves a MEMS-based scanner, 1550-nm laser, and bistatic advanced receiver with embedded deterministic artificial intelligence to deliver high-performance at a low cost. The modular, software-configurable platform achieves exceptional range, resolution, and frame rate, and through its proprietary active scanning, can capture intraframe radial and lateral velocity.

CF Finance Acquisition are a newly-organised blank check company formed for the purpose of effecting a merger, capital stock exchange, asset acquisition, stock purchase, reorganisation or similar business combination with one or more businesses.

General News

Yaris Takes № 1 Europe Sales Slot in January

GENERAL NEWS

New-car sales in Europe plunged by 26% in January, as lockdown measures to minimise a second coronavirus wave battered sales in the region's largest markets.
The models that propelled brand growth in January were the Lotus Exige, Smart ForTwo, MG HS, Volvo XC40, Porsche Taycan, and the Lamborghini Aventador, according to figures from market researcher JATO Dynamics.

Meanwhile, 16 brands including Suzuki, Maserati, Toyota, Jeep, Rolls-Royce, Aston Martin, Dacia, and Tesla reported month-on-month sales declines but still beat the overall market. A number of models increased sales in January despite retail challenges caused by the pandemic, including the Ford Kuga, Smart ForFour, and Land Rover Defender,

The Toyota Yaris was Europe's top seller in January, with 18,094 units shifted. The small-hatchback segment was followed by the Peugeot 208 and the Dacia Sandero in second and third place, respectively. Europe's perennial market leader, the Volkswagen Golf, finished fourth with a volume of 15,228.

The Yaris won the month by increasing year-on-year sales 3%. The Dacia Sandero, Peugeot 2008 were the other models in Europe's top 10 that increased sales in January. The 2008 was up 87% and the Sandero rose 13%.

Top 10 sellers in Europe in January 2021

Yaris	208	Sandero	Golf	Corsa	2008	Clio	Panda	T-Roc	Octavia
18,000	17,000	16,000	15,000	15,000	15,000	14,000	14,000	14,000	14,000