

Editorial

One Sunny Day At Bentley Headquarters...



During the DVN Munich event, I talked to Ian Haughton; he heads the lighting team at Bentley, and he invited me in Crewe to meet the team and present all details about the new Continental GT. The Bentley lighting team has grown very fast over the last four years, from five to 24 people, with a mix of senior lighting experts and skilled young engineers. It's a good mix to continue the long heritage of Bentley in premium design execution combining technology and luxury. Engineers are grouped into dedicated teams focused on project management, simulation, opto/mechanic/thermal design, and EE integration.

Lighting has become one of the most important features on new Bentley vehicles, including new functions development. The team have developed special skills in optical simulation for interior and exterior lighting rendering, to be in line with the uppermost customer wish: excellence!

Haughton delegated the organisation of the visit to Andy Twiss, whom I've known for around 10 years; he was in the GTB Installation working group I led. I'm grateful to him for the organization and the wonderful visit to the Bentley Heritage Centre and Lineage tour.

At the end of this week's DVN Newsletter, you'll find all the information for our [DVN Tokyo workshop](#) next month on 11 - 12 June. We've published the final docket, and

it's time to register. We are glad to gather the whole Japanese lighting community for this 5th Tokyo workshop. Looking forward to meeting you there with DVN senior advisors Wolfgang Huhn and Hans Joachim Schwabe!



Paul-Henri Matha
DVN Chief Executive Officer and Lighting General Editor

A handwritten signature in black ink, appearing to read 'pammuuu'.

In Depth Lighting Technology

DVN Field Trip: Bentley Lighting



Bentley was founded in 1919 and became legendary in motorsport during the 1920s, winning the prestigious 24 Hours of Le Mans five times between 1924 and 1930. The founding slogan, still valid, was:

"We were going to make a fast car. a good car. the best in its class"

The "Bentley Boys," a group of wealthy and daring drivers, embodied the brand's adventurous and competitive spirit. Bentley was acquired by Rolls-Royce in 1931 after the Great Depression, and shifted toward luxury vehicles. Models like the R-Type Continental of the 1950s showcased the brand's ability to blend high performance with opulent design.



In 1998, Bentley was acquired by the Volkswagen Group, who revitalized the brand with significant investments in technology and production. Modern Bentleys, such as the Continental GT and Bentayga, fuse traditional craftsmanship and cutting-edge engineering.



Bentley have a long history of design, technology, and perfect execution. If you have a focus on lighting, a lot of details from previous cars can be seen in current vehicles. Bentley have always put a lot of effort into even very small details; this is a key difference between premium and luxury vehicles.

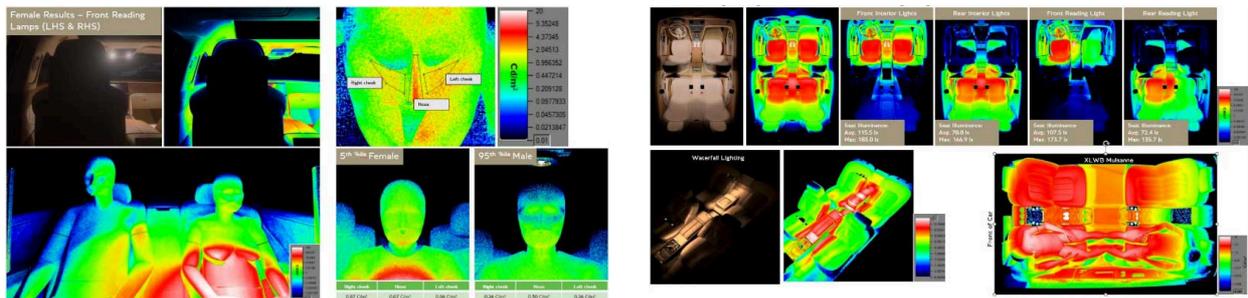
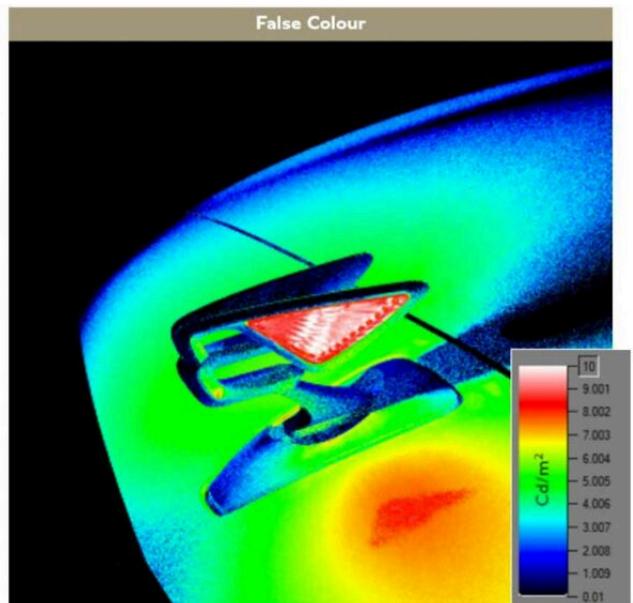
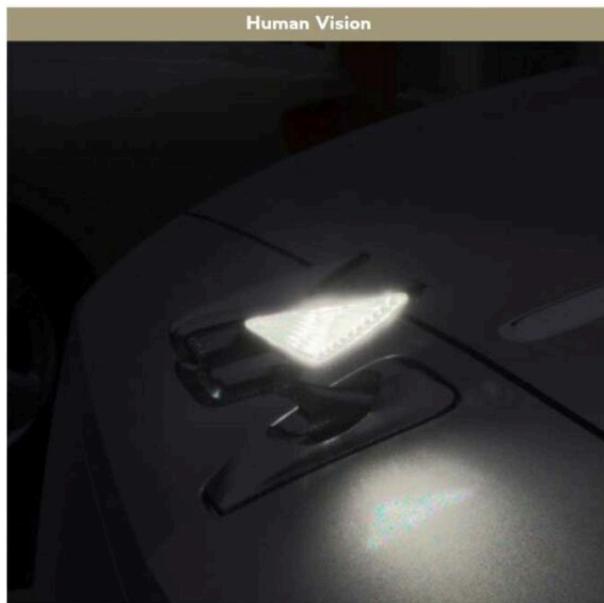


Bulb shields, headlamp cleaning systems, and light stalks are some beauties you could not really imagine.



To obtain this kind of result, Bentley's R&D and design team have put a lot of effort into optical simulation. Their tools include TV displays with very high brightness (20,000 nits) to see all possible faults and simulate with accurate luminance. They hold a Speos licence including a VR lab to be fully immersed in interior cockpit to analyze colour-matching between interior lighting and surfaces (including woods and coatings, for example) and sun reflections on chrome and on displays.

Starting from A-class surfaces defined in studios, the Bentley team can get full immersive simulation within a month — that would be totally impossible with real physical mock-ups. Bentley's Speos expert can adapt and change optical properties of materials and optical surfaces (e.g., graining) to improve homogeneity or reduce reflection, to speed up development loops between the studio, the lamp suppliers, and all the interior panel suppliers.



To do so, the Bentley team invested in HPC (high power computing) just for lighting to boost VR simulation, to use the tool at its maximum power capacity. They do these VR simulations with different mannequins, from 5th-percentile females to 95th-percentile males (different positions), for lighting as well as HUDs (head-up displays), regular displays, reading and stowage lighting, waterfall lighting, puddle lights, and visibility of red light outside the car – a regulated thing in R48, never easy to handle.

Bentley's heritage is not just luxury, but also performance. I had the chance to drive the Continental GT with its 48-pixel ADB on archetypical British small curvy roads. The experience was really good. The ZKW headlamp provides 1,050 lumens on low beam

and 2,400 lumens on high beam — an enormous amount of light on the road, which provides for perfect vision.



Rear lamp with 110 LEDs per lamp for position lamp

Bentley changed strategy on the new Continental GT. From a $\pm 10^\circ$ horizontal spread of high beam, with I_{\max} of 139 kcd, they've increased the global flux to 2,400 lumen, meanwhile they increased the horizontal spread to $\pm 20^\circ$, reducing the I_{\max} to 97.5 kcd (that was enough for me). This provides a very comfortable panoramic vision.

The headlamp comprises three lighting units. On low beam, the three units are lit. One module provides the low beam foreground and high beam range, while the other two are 24-pixel modules for the cutoff and ADB high beam (see previous DVN article [Design Award for ZKW Light Module](#)).

What is interesting with this concept is the compliance of this module with SAE and ECE photometric requirements with software settings. There's no need for different hardware, different headlamps, to meet different regulations. For a low-volume automaker like Bentley, it makes great sense to reduce proliferation of hardware variants.

We concluded the discussion with a higher view to see what challenges they have today. The Bentley team gave me five main items they are now focusing on:

- Close working with Style/ UX and Project, to define clear requirements and roadmaps
- Close working with the group to develop new functionalities for light, to increase communication by light (autonomous light, charging status show with grille and rear lamp, road projections...)
- Possibility of on-demand, OTA personalization of the videos and animations
- Increase interaction with Bentley apps
- To scout new suppliers and technologies, through supplier tech shows and visits to far-East suppliers

Great pictures of the team, taken by Raphael Rottmair:



Lighting News

New Jeep Compass Has New Lights

LIGHTING NEWS



Jeep's newest, third-generation Compass has a more aggressive look, a fancier cabin, and is available with electric propulsion for the first time. With 2.5 million units sold worldwide since it was launched in 2006, the Compass is one of Jeep's most popular models. Jeep will be relying on this new model to win a share of Europe's popular C-SUV segment, which now accounts for around a quarter of all car sales in Europe and is expected to be 90 per cent electrified by the end of 2026. Based on the same STLA Medium platform as the Vauxhall-Opel Grandland, the Citroën C5 Aircross, and the Peugeot 3008, the new Compass' design was a collaborative effort across various global studios — led by Jeep's team in Turin.

It's really interesting to see the design evolution on the front. We find a great example of the 75-mm rule between different lit area of the front position lamp, and the lit Jeep rear logo and the X-shape in the taillights, well known on the Jeep Avanger.



Volvo XC70 is Back

LIGHTING NEWS

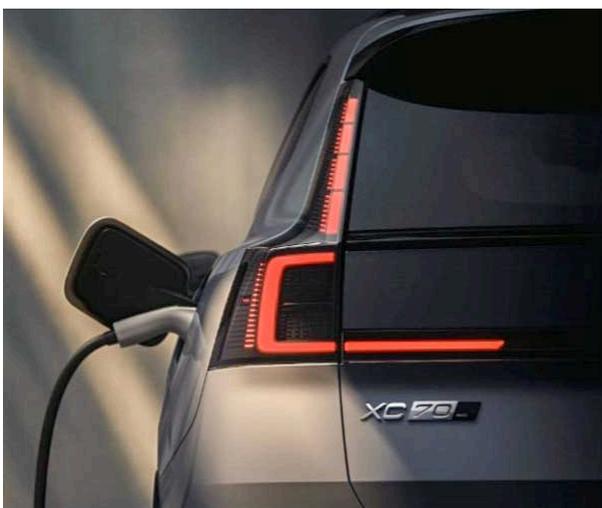


Volvo are reviving the XC70 model name for a new long-range plug-in hybrid SUV for the Chinese market. The XC70 name has been dormant since 2016, when the off-road version of the third-generation V70 wagon was discontinued. 'XC' originally stood for 'Cross Country'.

Volvo are saying the new XC70 will have an electric range of up to 198 km — over twice what the similar-size XC60 PHEV can achieve. The XC70 is described as slightly larger than the XC60 and looks much like a downsized XC90. But rather than being a close technical relation of that car, it is based on a new architecture designed specifically for range-extended electric vehicles.

If we have a look at lighting elements, we can see small lit **volvo** callouts in the headlamps and rear lamps — a clear familial tie with the XC60, C40, and EX90 — and a split front lighting package, for the first time on a Volvo. The upper 'Thor's Hammer' element provides the DRL and turn indicators, and the main road-lighting headlamps are stacked below.

Watch for more details to come soon.



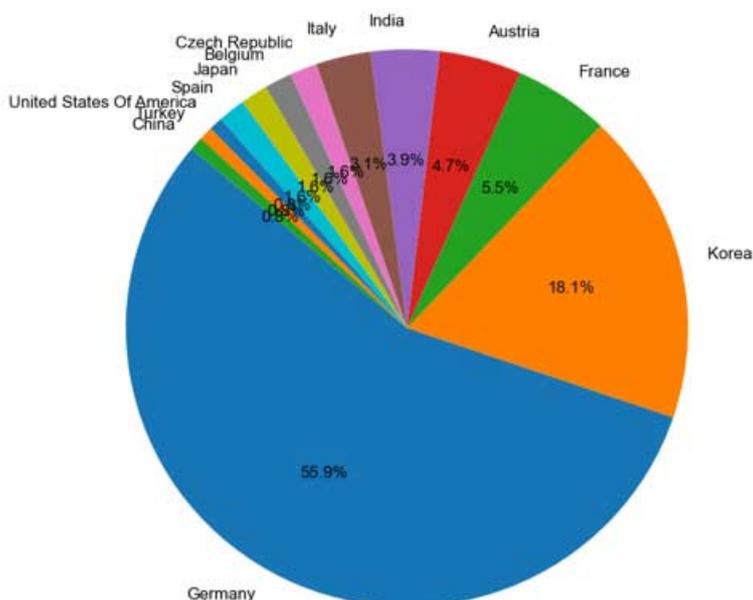
Lighting Meets Digitalization: A Preview of ISAL 2025

LIGHTING NEWS



As the automotive industry moves deeper into the age of digitalization, ISAL 2025 reflects this shift with a program that places intelligent, adaptive lighting and V2X communication at the centre of the conversation. With 65 oral and 20 poster presentations selected from 127 submissions, this year's symposium exceeds the number of submissions for ISAL 2023.

Contributions come from 13 countries, with strong representation from Germany, France, South Korea, China and the United States as countries with a vibrant automotive industry and research culture. Notably, 22 of the submitting authors are women, marking a clear increase in gender diversity.



A major focus of the program is the growing integration between lighting systems and driver assistance technologies. The main session on Lighting for ADAS and ADAS for Lighting highlights how deeply embedded headlamp systems have become in the vehicle's sensor and software architecture. From camera-based pitch detection to zone-based light distribution, the line between sensing and illumination continues to blur.

This theme continues in the second main session, Future Lighting and Intelligent Lighting Functions, which explores advances in matrix beam logic, energy-optimized lighting strategies, and context-aware virtual sensing — all pointing toward lighting systems that are smarter, more flexible, and more globally compliant. Another area gaining traction is light-based vehicle communication. Two full sessions are dedicated to external HMIs, symbolic projection, and on-ground signalling for automated vehicles. Whether through motion-capture studies or VR simulations, researchers are asking how vehicles can clearly and intuitively communicate intent to pedestrians and other road users — without relying on traditional signals. The answers are becoming more technical, more urgent, and increasingly interdisciplinary.

While these innovations look to the future, ISAL 2025 remains grounded. Issues such as glare and the various causes of glare on the road at night, visual performance, and night-time visibility are as relevant as ever. Several sessions address discomfort glare, visual fatigue, and contrast-based object detection — combining technical optics with human-centric design.

Headlamp design, optical concepts, and new light sources also remain core pillars of the event. This year, ams Osram — winner of the 2024 Deutscher Zukunftspreis (German Future Prize) — will contribute an impulse presentation on the evolution of HD lighting modules, underscoring the high level of innovation in this field.

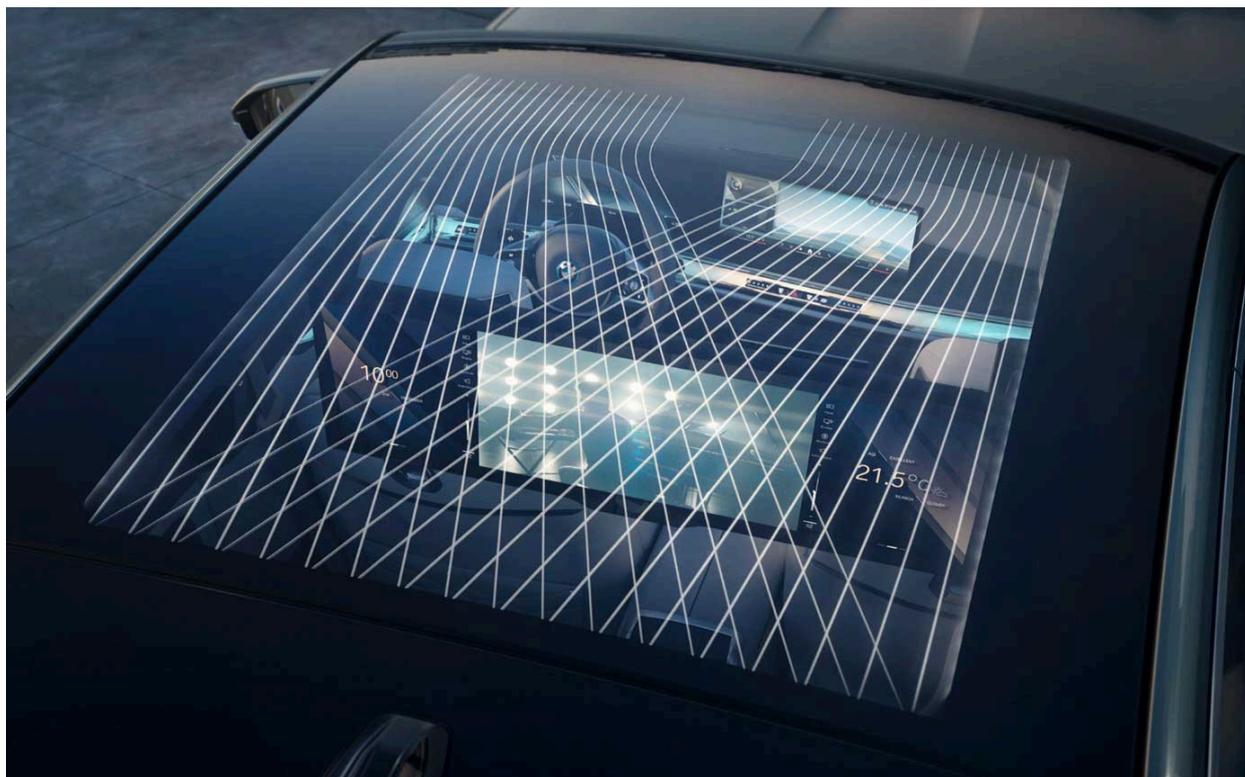
The program also reflects a growing awareness of environmental responsibility. **Sustainability** has become a critical design factor: from circular lighting design and recycled materials to lifecycle analysis and climate-aware system architecture. This systems perspective aligns naturally with the rise of software-defined vehicles, where modularity and adaptability are essential.

For the first time in its history, ISAL 2025 will publish all accepted papers in an open-access format. Each contribution will receive its own DOI and be hosted on the TU Darmstadt publishing platform — a significant step forward in scientific transparency, visibility, and impact.

With record participation, a growing diversity of voices, and sessions ranging from adaptive lighting and V2X signalling to optical technologies and emotional interior concepts, ISAL 2025 captures a field in transition. It is a symposium that balances engineering depth with system-level vision — illuminating not just the road ahead, but the evolving role of light in the future of mobility.

Lit Roof! What Do You Think?

LIGHTING NEWS



BMW i7 lit roof

By Paul-Henri Matha

One current example of lit transparent roof can be found on BMW i7.

I took time during Shanghai autoshow to visit Saint-Gobain Sekurit (French company) to exchange about lit roof. This is a topic we have never covered in DVN lighting nor DVN interior.

The glass is used as a light-diffusing surface, reproducing the desired pattern design. LEDs are placed along the edges to inject light into the glass through an optical system laminated within it.



Pictures of the courtesy of Saint Gobain Sekurit

Similar technology was also shown on Antolin Booth

Aledia

LIGHTING NEWS

Aledia

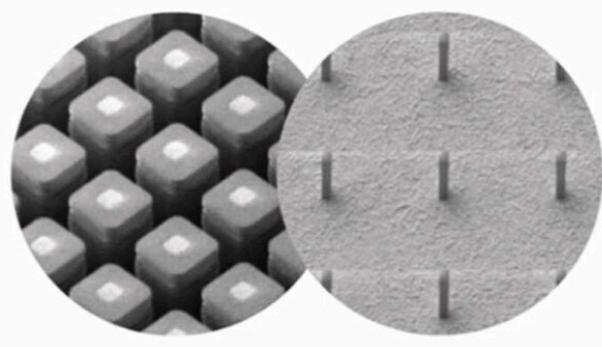
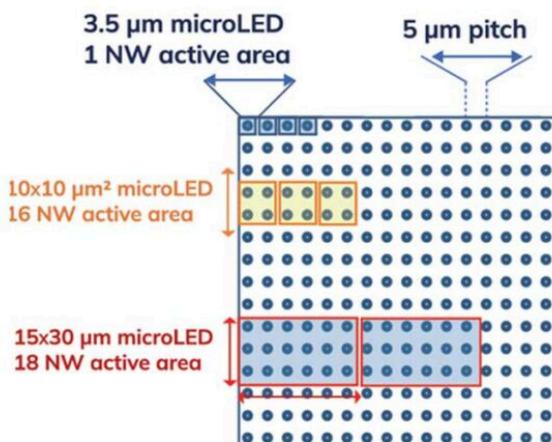
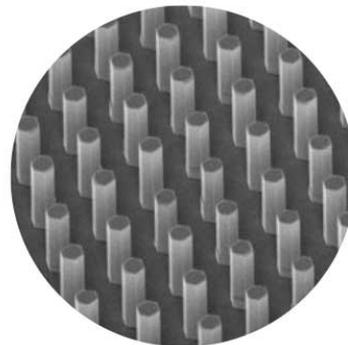


Aledia is a spinoff of CEA-LETI, in the Grenoble region of France, and they've already launched several major semiconductor companies. DVN's Paul-Henri Matha and Jean-Paul Ravier talked with Aledia sales managers Frédéric Moutier and Félix Marchal, about their innovation in nanowire diodes.

Aledia's 3D GaN nanowires are a technology delivering enhanced brightness and energy efficiency, along with superior pixel density and resolution. Their three-dimensional structure allows precise control of light emission, making displays more efficient and well suited for advanced applications such as augmented reality and other high-performance display solutions.

They have developed — after more than 10 years' R&D efforts and 300 patents — three main types of nanowire LED:

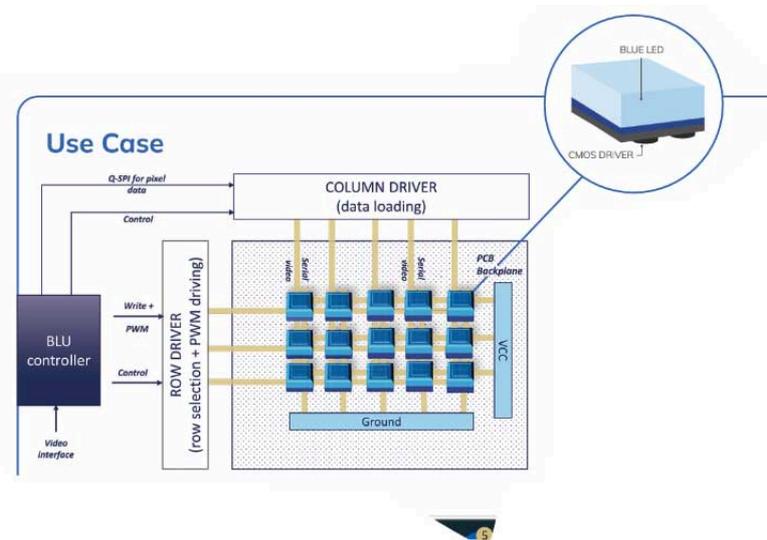
- Nova Blue MicroLED ALD-LD-000X for cost-competitive MicroLED mass production for small and mid-size displays (tablets, laptops). Their chip size, from 15×30 to $3.5 \times 3.5 \mu\text{m}^2$ achieves a record external quantum efficiency (EQE) of 40 per cent, and up to 1.1 billion chips can be produced per 8-inch wafer (scalable to 12-inch).



microLED ocean on donor wafer

Display populated 3.5 μm LEDs

- Blue Digital LED (ALD-SP-0004) for high-performance display applications like virtual reality, automotive central information displays, HUDs, televisions, notebooks, gaming and professional monitors. These



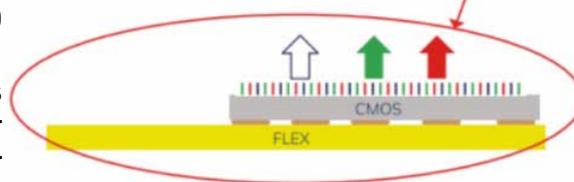
are a 2-in-1 component with the blue-emitting LED integrated with CMOS driving electronics equipped with on-chip 16-bit data memory and PWM current driving capability, and on-chip compensation for non-uniformity, and with a peak luminous intensity of 50 mcd per chip at 25 °C, allowing also reduced power consumption.

- Colour and RGB micro-displays (ALD-MD-2001, ALD-MD-2002, ALD-MD-2003, ALD-MD-2004) to optimize power efficiency and form factor for augmented-reality optical engines and AR glasses. These use gallium nitride nanowires grown on silicon substrates to display either single colours (red, green, blue) or all three. Their sub-pixel pitch can be as small as 2 μm sized for a 3 × 5 mm, supporting 720p and QHD resolutions. Thanks to nanowire technology, the light emission is optimized within a ±20° cone without the need for microlenses.

This allows a very good power consumption — from 1/6 to 1/2 that of traditional solutions — with good reliability and colour stability.



Aledia currently produce 5,000 silicon-based wafers per week, with mass-transfer operations being carried out by their customers, as well as colour conversion. The target markets are mainly the display and telecommunications sectors.



One of the important potential markets is virtual reality glasses.

For larger screens, only blue LEDs are available, and colours are possible by dint of quantum dots.

Aledia are ready for mass production, with a major start of production by their customers scheduled for 2027.

To go further ...

DVN Tokyo Workshop, 11 - 12 June: Final Docket Published

TO GO FURTHER ...



We have just [published on the DVN website](#) the final docket for this year's DVN Tokyo Workshop. We can already confirm that it will be the biggest event we have ever done in Japan, with 27 exhibitors, 45 speakers, and a panel discussion. Main topics on agenda will be design trends, safety, interior lighting, sustainability, regulation (with participation of the main stakeholders in Japan), innovative lighting technology, and ways of working and validation.

Around the world, Japanese automakers produced 17.51 million automobiles and 25.19 million motorcycles in 2023, representing around 30 per cent of the worldwide motor vehicle market! Japan is a key player in the automotive industry, ranking 3rd in motor vehicle manufacturing (with around 9 million vehicles produced) and 4th in motor vehicle sales (just behind India, with 4.8 million vehicles sold in 2023). The Japanese auto industry employs around 5.58 million people, including 883,000 in automobile production alone.

Sign up and secure your place; come join the DVN team — Geoffrey Lebrun, Wolfgang Huhn, Hans Joachim Schwabe and Paul-Henri Matha — in Tokyo next month!



DVN Tokyo sponsors



DAY 1 • JUNE 11, 2025

11:00 am **REGISTRATION & QUICK LUNCH**

01:00 pm **KEYNOTES**

“DESIGN TREND, AUTOMOTIVE CHALLENGES, LIGHTING CHALLENGE”

Stanley Electric – Takuya Matsumaru, General Manager, Exterior Technology Department Automotive Technology Division:

- *Towards Safer Roads: Optical Communication in Human-Vehicle Interaction*

Nissan – Yasukazu Kanda, General Manager, Interior and Exterior Engineering Department:

- *Lighting required role in view of Japanese market environment and culture*

S&P – Lydia Wang, Senior Research Analyst, Japan-Korea Automotive Component Forecasting and Analysis:

- *Where are we going? - A brief automotive market outlook in numbers*

02:00 pm **SESSION 1**

SAFETY

Nichia & Infineon – Hiroaki Kuroda, Project leader, PLS product line, Nichia Corporation Japan & Haruyuki Komatsu, Director, Head of Product Management, Infineon Technologies Japan:

- *Light digitalization with μ PLS and advanced automotive system*

ams OSRAM – Christian Wittmann, Senior Director Mobility:

- *ams OSRAM's LED solutions improving safety of mobility*

Mitsubishi Electric – Shuhei Ota, Advanced Applied development Center:

- *Visibility Evaluation during Curve Driving in Headlamp Beam Control Technology Using Gaze Information*

Koito – Honami Fujii, Assistant Manager of Research & Development Dept:

- *Light-Based Communication for Autonomous Vehicles and Road Users*

Honda – Kazuyuki Kawamura, Assistant Chief Engineer:

- *Study on Improvement of Pedestrian and Vehicle Visibility by Geometric Patterns Projection Lighting*

Ansys – Zach Derocher, Senior Application Engineer:

- *Comprehensive Optical System Design with Ansys: Micro-LED Adaptive Driving Beam Headlamp*

YEJIA – Nan Jixue, Chairman of Yejia Optical Technology (Guangdong) Corporation:

- *The Key Optical Components in Pixel Headlamp*

Q&A

03:45 pm **COFFEE BREAK**

04:45 pm **SESSION 2**

INTERIOR LIGHTING

Inova – Aleksandar Živanović, Senior Sales Manager & Project Responsible for ILaS® & ILaS® RBG:

- *ISELED – The automotive ambient lighting standard*

Nichia – Hiroaki Kuroda, Manager Automotive business unit:

- *Revolutionizing automotive interior, the future of Laser illumination*

Nissan – Yasukazu Kanda, General Manager, Interior and Exterior Engineering Department:

- *Transition of interior lighting function and future outlook*

Marelli – Mitsuyoshi Naritomi, Vice President, R&D Interior Experience Division:

- *Marelli's Vision for the Future of Vehicle Interiors*

Brightek Optoelectronics – Dr. Darren Kao, Assistant Vice President:

- *A Smart Lighting Solution for MCU-Free Automotive Systems*

NISSHA – Jun Sasaki, Director of Engineering, Technology and Business Development:

- *Smart surfaces, seamlessly integrated: mutech by NISSHA*

TactoTek – Sami Hyyryläinen, SVP Sales and Business Development:

- *TactoTek IMSE® - Superior Performance for Functional Illuminated Surfaces*

Q&A

07:00 pm **COCKTAIL & DINNER**



DAY 2 • MORNING • JUNE 12, 2025

08:30 am KEYNOTE

DVN – Paul-Henri MATHA, CEO:

- *Lighting trend*

Uno Minda – Todd C. Morgan, Global Head of Lighting Technologies and Innovation:

- *Lighting Innovation in Overdrive: India's Growing Market and Emerging Trends*

09:00 am SESSION 3

SUSTAINABILITY

Keynote lecture – Ministry of the Environment – Yohei Kawada, Director:

- *Industry-government-academia efforts to expand the use of recycled materials in automotive recycling and responses to challenges*

Keynote lecture – Ichikoh Industries – Kazuyuki Miyashita, Deputy President and CTO

Honda – Masaaki Fujimoto, Manager Chief Engineer, Sustainable Material Department Mobility Material R&D Division:

- *Honda's Resource Circulation and Sustainable Materials Technology*

ams OSRAM – Ralf Hying, Senior Director R&D Automotive Lighting (AMSP)

Sumitomo – Kazuhiro Yamazaki, Head of global product marketing, MMA Division:

- *A solution for sustainable lighting : proposal from New PMMA materials*

SABIC – Masaaki Takahashi, Sr. Engineer, Automotive Petrochemicals:

- *Lighting the path to net zero GHG emissions and enhanced sustainability with automotive thermoplastics*

Q&A

10:40 am COFFEE BREAK

11:30 am SESSION 4

REGULATORY

GTB – Wolfgang Huhn, GTB President:

- *GTB & GRE Status*

JASIC

Mercedes – Benjamin Gritsch, GRC/RDVK, Senior Manager Exterior:

NTSEL – Michiaki Sekine:

- *Discussion to establish technical requirements for ADAS marker lamps*

MLIT – Yasumasa Tominaga:

- *Research on Standards for Automotive Lighting in Aging Society*

DVN – Paul Henri Matha, CEO:

- *Summary of DVN forum and ADAC forum about glare*

ROUND TABLE with GTB, JASIC, Mercedes, MLIT, NTSEL, JAMA and JAPIA

01:00 pm LUNCH BREAK



DAY 2 • AFTERNOON • JUNE 12, 2025

02:00 pm SESSION 5

INNOVATIVE LIGHTING TECHNOLOGY & WAY OF WORKING, VALIDATION • PART 1

Brightview technologies – Michael Murphy, Chief Commercial Officer:

- *Novel Automotive Lighting Solutions Using Computational Optics*

Luminit – Stanley Kao, VP of Business Development:

- *Illuminating the Road Ahead: Integrated 3D Curve Light Shaping Diffuser Lens Meets Prism Film for Next-Gen RCL/DRL*

VueReal – Rob Selley, CEO:

- *Saving money using in-glass microLEDs*

Zanini

- *Thin illumination for radomes and exterior trims*

Liaowang – Dan Gu, President:

- *Automotive Smart Interactive Display Technology: Development and Future of MDL*

Refond – Grayson Liao, LED Expert:

- *Mini/Micro LED Solution for Automotive Interior & Exterior Display Application*

Elmos – Artur Biernatowski, Director Product Segment Lighting:

- *Advanced LED Drivers: Powering the Next Generation of Automotive Lighting*

Q&A

03:30 pm COFFEE BREAK

04:15 pm SESSION 5

INNOVATIVE LIGHTING TECHNOLOGY & WAY OF WORKING, VALIDATION • PART 2

Sharp – Yasuaki Hirano, Member of the Board, General Manager, Head of Laser business Unit:

- *Visible light laser diodes for automotive applications*

Lumileds – Takaaki Yagi, Senior Manager Technical Support Group:

- *Expanding the horizons of Car Body Lighting*

HASCO Vision – Taiki Shibata, Design Senior manager:

- *Examples and Future Developments of Advanced Lamp Systems*

Synopsys & Dassault Systems – Tobias Schmid, Ph.D., Technical Product Management, Director Optical Solutions Group & Stephan RITZ, CATIA R&D Design I Product Experience, Portfolio Director:

- *3DEXPERIENCE CATIA & LucidShape X - Redefining Automotive Lighting Developments with integrated Virtual Twins*

LMT – Stephen Dahle, Member of the Board:

- *Camera Based Vehicle-Level Front Lighting Testing: An Overview*

AML Systems – Hassan Koulouh:

- *Automatic Headlight Adjustment: Lumems Technology for a Perfect Beam Without Manual Intervention*

Varroc – Jeneeson Jeevamani, Head Engineering – Lighting:

- *Varroc way of working for Global Lighting projects from India*

Q&A

05:45 pm CLOSING