

Tue, 7 February 2023
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #789

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

DVN Workshop And Anniversary Gala: A Grand Success!



The DVN Workshop was held last week, with 350 attendees in the marvellous Hyatt Regency hotel in Paris. The presentations, discussions and exhibits covered safety everywhere... regulations...software, sensor integration and fusion, OTA updates (new keys for new business models)...sustainability, energy savings, weight, material, recyclability (ecological responsibility is everyone's job)...styling (lighting really is the new chrome)...digital front ends...exterior displays.

Emotion was everywhere—concerning the needs of car users, of course, but also in the room during the gala DVN award ceremony. It was a truly amazing event, and you can read about it starting now, with special coverage in this week's DVNnewsletter.

I personally and professionally thank the speakers; the session chairs; the exhibitors, and the whole DVN team—you all did a wonderful job.

Don't miss the [DVN Interview](#) of Valeo's CEO, Christophe Périllat

Sincerely yours,

W. Frally
DVN CEO

In Depth Lighting Technology

Emotional Award Ceremony at DVN Workshop



In a celebratory evening ceremony, DVN bestowed a brace of awards to congratulate recipients on their great job.

Paul-Henri Matha: Personality of the Decade



Paul-Henri Matha, shown here with Hector Fratty, received the DVN Personality of the Decade award. He was selected by the DVN board, who considered three criteria: achievements in-company; number and quality of lectures at congresses, and community-benefitting work done in advancing regulatory improvements, chairing events, and suchlike.

Achievements in-company

In 2012, Matha became general manager for Renaults' exterior lighting, seats, and safety systems in Romania. His 100-engineer team focused on developing technology for all brands of the Renault Group in Europe; Africa; South America, and India. In 2015 he came back to France and took the position of Renault lighting expert. His main activities were on the

predevelopment of low-cost full LED lamps, presented at VISION 2018, and the predevelopment of the first car equipped with matrix headlamps. In 2018 he joined Volvo Cars to partake in the development of pixel lamps for the XC40; HD DLP lamps on the Polestar 3 and EX90, and animated taillights on the Polestar 2; C40, and V90. He holds 10 patents in exterior lighting technology.

Congress lectures

Since 2012, Matha has given more than 20 lectures at ISAL; VISION; DVN Workshops; IQPC; ALE, and Autosens.

Community-Benefitting Work

Matha is a member of the VISION congress board; the ISAL Steering Committee, and the IFAL board. He is active in regulations—he co-chairs the GTB Strategy and Installation Working Groups and is a member of the SAE Lighting Systems Group. Indeed, his is a well-deserved award!

Michael Hamm: Best Lecture in 2022



Michael Hamm speaks eloquently; engagingly, and knowledgeably—his lectures are never boring, and people like to listen to him. Normally the room is full, and the audience is quiet when he is the speaker.

His presentation *ADB: Science, Technology and Evaluation* at the Rochester DVN Workshop 2022 was a cumulation of many aspects regarding ADB's efficacy and safety performance. His presentation showed the data from visibility experiments that prove the improvement of detection distance and then linked investigations on actual ADB models worldwide, along with a thoughtfully-crafted estimate of the number of ADB cars on the roads. The slam-dunk results: more than 200 models and more than 6 million cars have ADB, and in the many millions of kilometres they've travelled, they've generated not a single safety problem or complaint. That, in turn, was an apt backdrop for Hamm's discussion of the U.S. ADB regulation put out by NHTSA. It was a phenomenal lecture, well worth this award!

Philipp Röckl: Best Hope Award



Philipp Röckl, shown here with Wolfgang Huhn, holds an engineering degree from Darmstadt University. He joined Opel's (now Stellantis') lighting development department to introduce new lighting simulation tools and processes, and in short order was promoted to group leader and to Lead Lighting Innovation Engineer. He has earned three (and counting!) important company innovation awards.

Rainer Neumann: Lifetime Achievements in Lighting



Rainer Neumann, shown here with Wolfgang Huhn, is a rockstar in the vehicle lighting field. He is one of the best-known lighting experts worldwide, and his dancing-photon videos are an eagerly-anticipated attraction of his equally informative and entertaining lectures. Neumann has worked over 40 years for at least three major tier-1 lighting suppliers, at a VP level. He holds over 120 patents and has long been quite active in GTB.

Salomon Berner: Lifetime Achievements in Lighting



After the famous École Polytechnique, Berner made his career in the aeronautics industry. When Hector Fratty founded DVN, Berner applied his skill, talent, and panache in sales; marketing; organisation, and finance; over 15 years he did a grand job of boosting and bettering DVN. He retired from DVN a year ago, to enjoy well-earned time with his family. Really, the success of DVN is his success!

Geoff Draper: Lifetime Achievements in Lighting



BART TERBURG REPRESENTING GEOFF DRAPER



GEOFF DRAPER

Draper's exemplary career in the vehicle lighting industry spanned nearly half a century. He worked in Britain, Italy, and Belgium. He successfully led; coordinated, and choreographed the monumental, once-in-a-generation effort to simplifying the UN lighting regulations; organised and led 20 DVN regulatory sessions, and tirelessly encouraged global harmonisation of regulatory requirements—largely on strength of his efforts, most countries (except the USA) recognise the UN Regulations. Draper worked to encourage the alignment of the Chinese GB standards with the UN technical requirements, and led the CIE TC-4-45 task force to create a standard headlamp performance assessment method which has found favour and is being adopted into rating systems around the world.

Ingolf Schneider: Lifetime Achievements in Lighting



Ingolf Schneider, shown here with Hector Fratty, started his career at Opel in 1981. In 1989 he got his first project in lighting: projector headlamps for the Calibra. In 1997, he took the lead of Opel's exterior lighting group.

He always proposed innovations to keep Opel at the level of premium cars in lighting: introduction of bi-halogen; xenon; cornering light; AFS; LEDs, and matrix lighting. Much of Opel's technological image is thanks to Schneider's efforts.

Lighting News

Valeo CEO at DVN Workshop: New Tech Brings Great Possibilities

LIGHTING NEWS



W. HUHN, CHRISTOPHE PERILLAT, H. FRATTY

Valeo CEO Christophe Perillat opened the DVN workshop in Paris with a keynote overviewing today's and tomorrow's lighting: "In the last few years, some lighting players have changed hands. The competitive landscape has changed significantly. The ongoing industry transformation is about addressing major societal challenges as the fight against global warming (EV) and the improvement of safety on the roads (ADAS).



"The accelerated democratisation of LEDs is enabling an unprecedented level of performance, while saving energy. ADB is clearly a great move toward safety, High definition allows to go even further with more than 20 kilopixels for premium ADB and roadwriting features.

"There is a clear move to digitalisation where front and rear lighting are used to communicate with [the car's] environment. Near-field projection all around the vehicle also offers new communication lighting features. 360° lighting projects onto the ground information about upcoming vehicle manoeuvres.

"In an EV, the radiator grille space is completely reinvested by the designers through lighting to rethink the entire front end of the vehicle. The central area of the car is illuminated. We are also starting to see illuminated logos (deployment is linked to regulation). All these technologies imply of course an increasing level of sophistication. Overall, we are facing a constant increase of complexity translated into an explosion of product requirements, on which we have to add cybersecurity.

"Software; AI, and digitalisation open up a formidable field of possibilities. They will allow us to go much further in terms of safety, creativity and customisation. Software-defined lighting will for example allow us to upgrade functionalities. It will facilitate over the air management and real time default identification. The new opportunities associated with software defined lighting are huge.

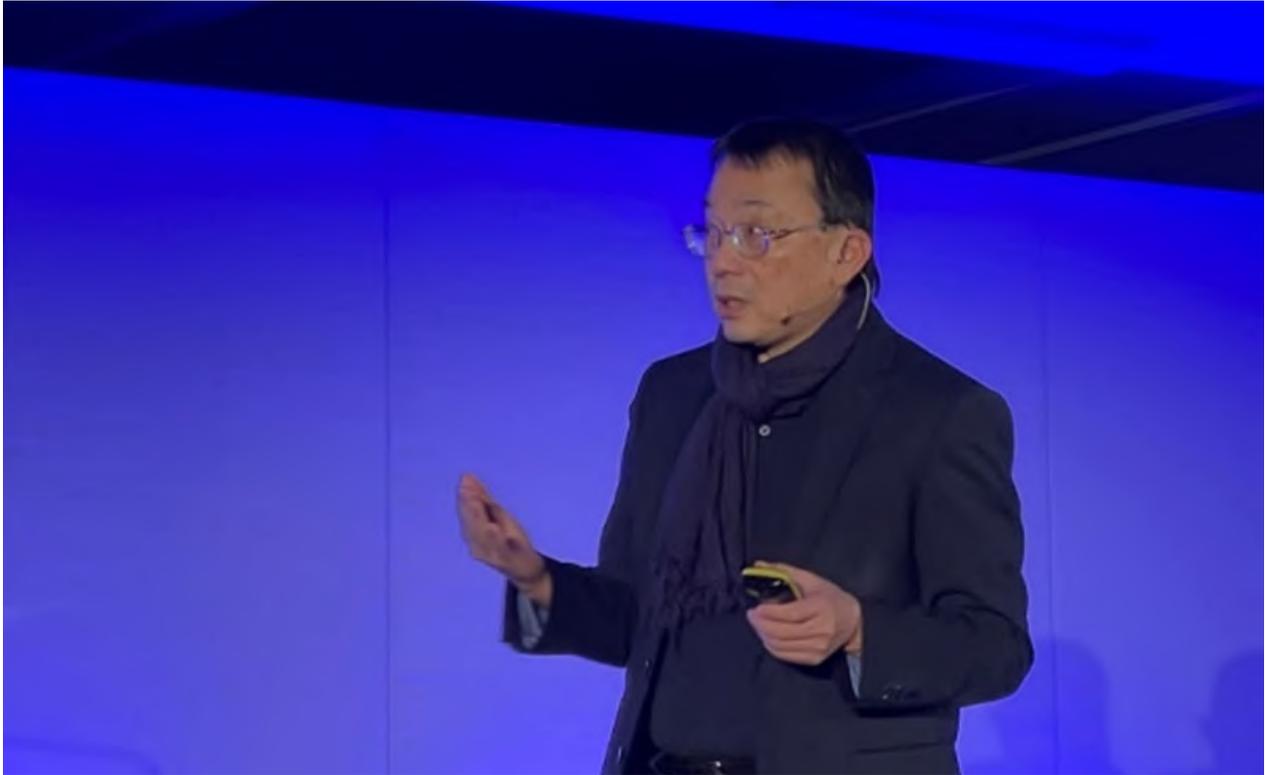
"China is at the forefront of the movement, because its regulations are more permissive and offer greater scope for expression. From this point of view, it is essential that Europe does not fall behind in terms of regulation if it wants to stay in the game".

Below, the link to the DVN Interview of Valeo's CEO, Christophe Périllat



Prof. Khanh: Adaptive Lights for Safety, Comfort, Sustainability

LIGHTING NEWS



In his keynote speech, TU-Darmstadt professor Khanh explained how we can optimise safety through lighting with better visibility and less glare; comfort with better homogeneity and road brightness, and sustainability with lighting depending on traffic.

Today, he said, headlights create perception conditions for the human driver as well as the ADB drive camera, with fixed regulatory requirements. In the future, headlights will create dynamic perception conditions for the driver and camera which provides better-matched support.

Professor Khan kindly granted us a topical interview:

DVN: What did you think of the lectures presented at the DVN workshop?

Prof. Khanh: There were some interesting lectures from Gerald Boehm of ZKW describing the role of cameras, and from Philipp Röckl of Stellantis mentioning the future role of AI (artificial intelligence) for image processing and object detection. The presentation by Ernst-Olaf Rosenhahn shows we have a new need for GTB and regulatory bodies to think about threshold values and switching time between daytime running light and low beam in order to reduce the energy consumption.

DVN: Do you have a message for automakers; lighting suppliers, and regulatory authorities?

Prof. Khanh: With the digitalisation of the lighting functions—front; rear, and new projections—we have to integrate sensors detecting the environment around the car (distance, ambient luminance, road geometry and traffic situation) with lighting functions (headlamps, rear lamps, projection and interior lighting systems) and with the signal processing unit and AI as a

decision-making platform in order to make the car smart and the traffic flow safe. Digitalisation alone is not enough.

The other point is that the new HSPR (headlamp safety performance rating) is not only a new rating method, but also the new specification metric for automakers to define their expectations of the headlamp quality for the next vehicle to be planned and for the optical and electronic designers of the headlamp system to the tier-1s to evaluate the illumination quality of the headlamp to be configured during the design process.

DVN: How does your lighting institute help meet the new challenges and aid regulatory development?

Prof. Khanh: We make research studies in order to have threshold values for switching on/off and for dimming the light functions in the right way depending on ambient parameters; to make lighting systems adaptive and therefore to reduce energy consumption and glare. We co-developed the HSPR method and software for rating the low beam; high beam; and ADB, with a public database for car customers; tier-1s, and automakers. We conduct studies on projection in order to accelerate the regulation process within GTB and GRE.

DVN: Do you have information concerning ISAL 2023?

Prof. Khanh: We are in plan right now and expect more people from Asia and North America after three years with COVID-19. ISAL 2023 shall be more a technical conference with special sessions for HSPR and for discussions on energy saving possibilities. We will have more communication between engineers for lighting with experts from driver assistance community (e.g. Continental, Bosch, Valeo) and camera and software companies. Two special sessions should be defined. One session for the new HSPR method with Drs. Hamm and Rosenhahn with automakers and tier-1s, and another session with Dr. Neumann on the potentials of reduction of energy consumption of automotive lighting functions.

Bentley: Artistic Ambiance of Lighting Orchestration Via Software

LIGHTING NEWS



BENTLEY

At the DVN Workshop in Paris, Bentley lighting boffin Mohamed Abd El Ghani said user wellbeing is a selling feature for luxury cars. To go beyond lighting function, delivering an emotional communication is a way to achieve Bentley's wellbeing visions for their users.

The thing that inspires them on what to make, he said, is natural light. The connection to nature is what people are really after—consider videos using nature to sell the car. Natural light is an alternative to the idea of homogeneous light. Colours are more than one hue. Play and creating shadows, exploring the textures of light.

There are three main tools Bentley use to achieve this—this is something Bentley have patented, as this is what is important to Bentley.

1. Optics

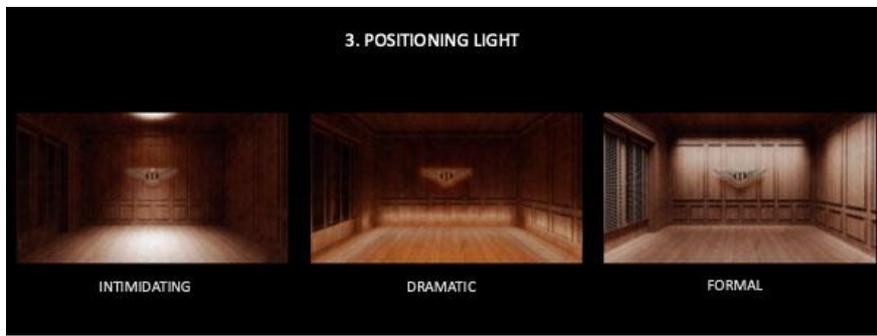
How do we achieve natural light? Reds and blues; Diamond 3D; texture of light through media; softness but still very sharp. Optic layers create such an image with sharp lines, and sharp shadowing.

2. Layering

Optics can make a pattern—that is what is referred to as a layer. This can change in contrast and focus, but we can also overlay one texture of projected light on top of another.

3. Positioning

We need light to see properly. Illuminate in the appropriate way for the situation, we can use light to exaggerate the emotion.



We can do the same in a room. Light from the bottom to make it more dramatic like the image.

Or more intimidating, Spot light, Focus on a feature

There are a lot of different variations and emotions that can be created. You have the same space, but different situational spaces can be created.

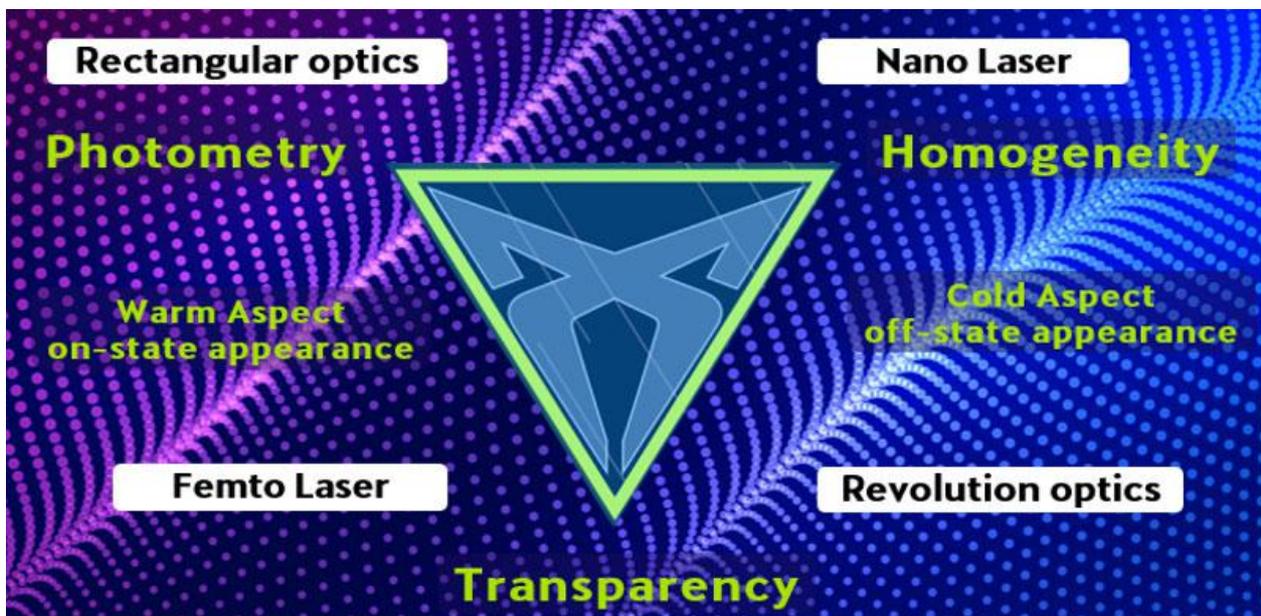
This is how Bentley deliver expressive, emotionally engaging lighting—making people’s wellbeing better by connecting them to nature.

DVN Workshop Report

The report of the more than 30 speeches of the Paris workshop will be available next week. By anticipation, two examples from Seat and Audi are given hereunder.

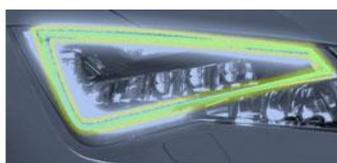
SEAT: From the Line to the Surface by Carlos Elvira, SEAT Lighting Manager

DVN Workshop Report



SEAT are designing headlamps and rearlamps with triangles since the Leon model of 2013. For SEAT, triangles express strength and energy, while the inverted triangle transmits a sense of tension.

SEAT have used this triangle shape with some evolutions from the beginning, from the pure triangle with the Leon 2013, to more complex triangles with Leon 2020 and Cupra, and now with the use of layers on the concept Cupra Tavascan.



LEON 2013



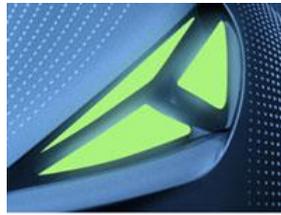
LEON 2020



CUPRA

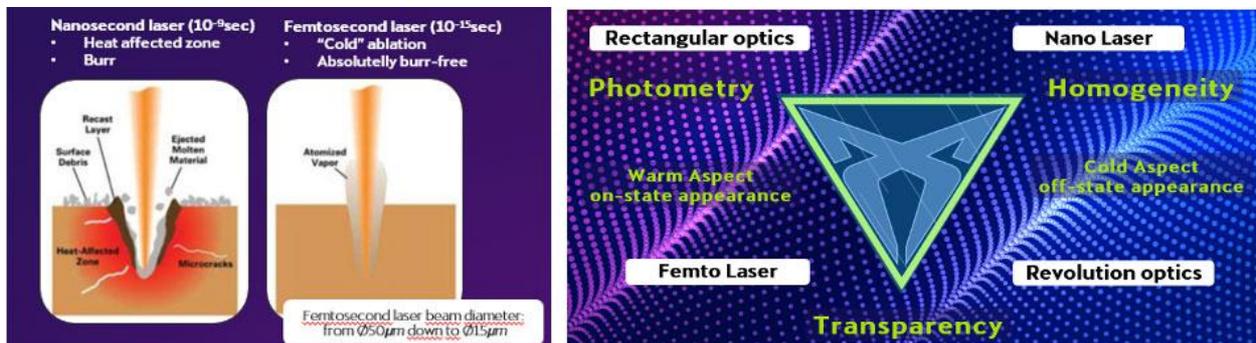


CONCEPT CUPRA TAVASCAN



And on the 2021 Cupra Urban Rebel concept car), SEAT proposed another way by using surface-lit triangles. Carlos Elvira and his team decided to develop a solution to obtain these specific surfaces with triangle surfaces targeting adequate photometry and good transparency, with good affordability; low energy consumption, and industrial practicability.

Many mockups were built since 2017. There are many parameters to take into account to obtain good illuminated surfaces. For instance, the structures reflecting the light could have different shapes—microsquares; microcones; microprisms, or microspheres...different sizes; spacings, and slopes. The processes to realise them has also a strong impact on the result. Nanosecond and femtosecond lasers were compared in detail: femtolasers achieve a highly transparent aspect and a more precisely defined optical design with 20-per-cent better photometric efficiency, while nanolasers give 10-per-cent better homogeneity.



Carlos Elvira presented during the conference nice mockups illustrating these studies with homogeneous surface triangles.

Audi: Customer Centricity for Innovation in Software-Defined Lighting

by Andre Hainzmaier, Audi Head of Lighting Innovation

DVN Workshop Report



Andre Hainzmaier, in this presentation, wanted to emphasise that software affects not only the product, but also the experience and the configuration. In the past, lighting efficiency was the main driver of innovation, but with digital light technologies, we start a new lighting era—opening completely new opportunities for safety; design; communication; wellbeing, and entertainment, and enlarging its applications to configuration and experience in addition to the product.

For the product, that means innovative hardware, customer-orientated functional development and emotional design. For instance, for new front ends, digital light will give much more freedom for safety, communication, and personalisation.



And similarly, digitalisation is giving to the rear face possibilities for communication thanks to the OLEDs segments, their number being considerably increased from 10 in the past to 200 in the future (Audi's new OLED demonstrator is shown here).



But also, the sides are involved particularly with the 360° illumination concept, including for instance lighting in pillars, or with ground projections. The 360° light increases safety for example to warn cyclists, is a strong support for communication that will be very useful with

autonomous cars and is offering new possibilities for styling and staging for a new exterior customer experience, for instance for coming and leaving. There will be many new user experiences taking into account all the journey of drivers from planning, approaching, sitting inside, driving, parking, and walking away. The interactions with lighting will be renewed with light functions on demand, light functions over the air, and with experience and play through light functions.

So, with digital light technologies, we start a new lighting era, opening completely new opportunities for safety; design; communication; wellbeing, and entertainment with innovative hardware and software, being customer-centric for new possibilities in user experience and emotional design, and taking care to realise it all with an optimised software-development process.