

EPIC Technology Meeting on Photonics for AR: The Tipping Point

10/14/2026

**TRI
LITE**

World's
Smallest
Projection
Display

**Laser beam scanning at the tipping point:
Towards efficient, wide-FOV, high-resolution ultra-compact AR displays**

Jörg Reitterer, Co-Founder & CTO TriLite Technologies

TriLite in a nutshell

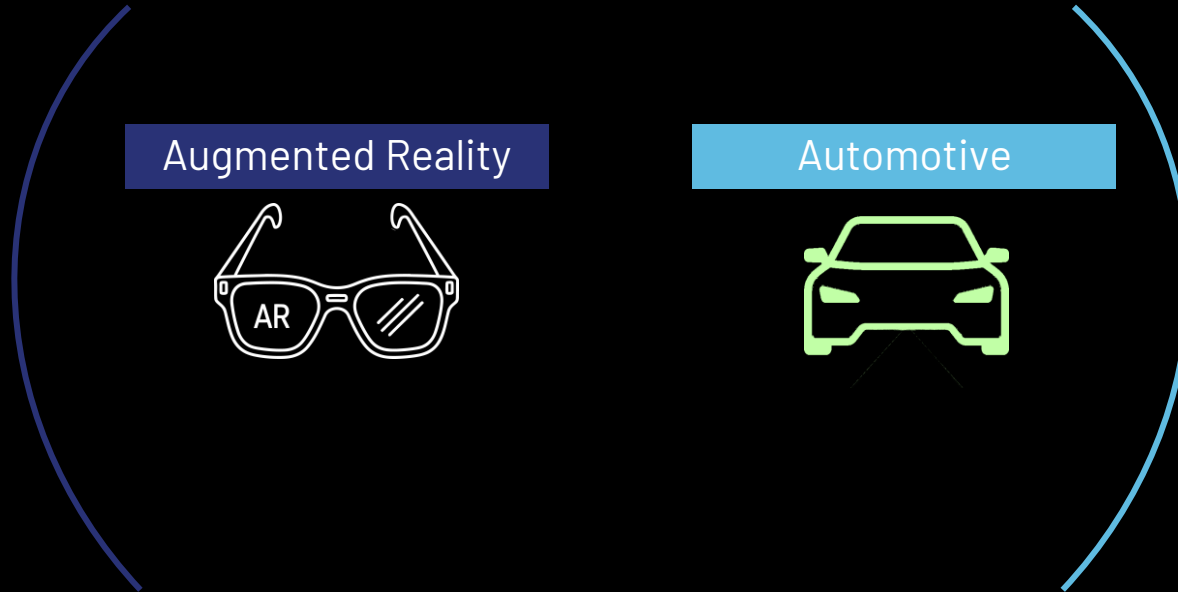
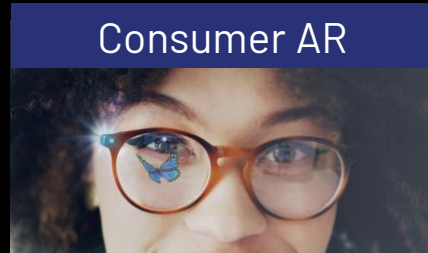
Eliminating the boundaries of traditional displays

Trixel® 3 Cube

We design and deliver the world's smallest
laser beam scanning projection display
for smart augmented glasses and
automotive projection systems

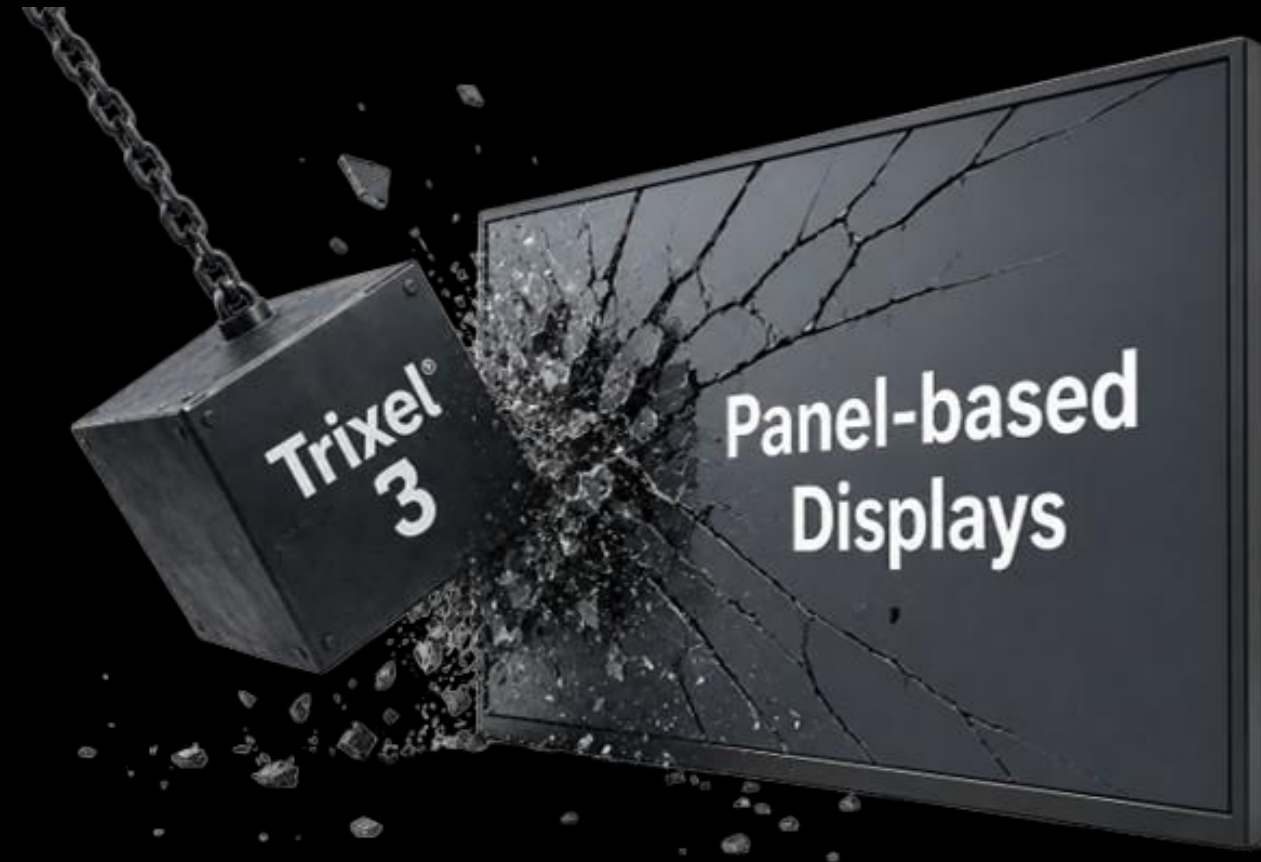


Our Trixel® 3 display platform is versatile



We overcome the limitations of today's traditional panel displays

- Our Trixel® 3 Cube technology platform is closing the gap between expectation and reality in Consumer AR and Automotive
- We are **smaller, more power efficient, with higher flexibility and superior color gamut** compared to traditional panel-based displays

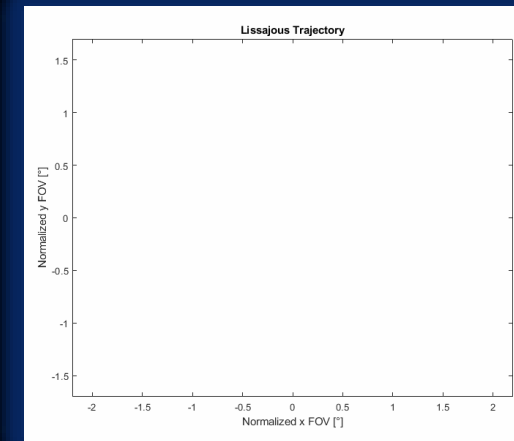


We are the leaders in building Laser Beam Scanning projection displays

- Inside our Trixel® 3 Cube display lies an RGB laser module, an array of optical elements and one MEMS mirror scanning in two axis, powered by state-of-the-art semiconductors (MEMS driver, laser driver, and image controller).
- We fire the lasers onto the MEMS mirror which scans and paints the image using Lissajous scanning.
- We drive the entire system with extreme precision to obtain highest image quality by handling calibration, corrections and precise alignment in our proprietary software stack.



Trixel® 3 Cube
Inside view



Lissajous
Scanning Trajectory

Our LBS overcomes today's micro-display limitations by being smaller and brighter



Brightness:

- Brightest display at 15 lm; 6,000 nits



FOV:

- Scalable to high FOV without increase in size



Size:

- Smaller than LCoS, OLED and μ LED (with projection optics included)



Color gamut:

- Large color gamut, 214%sRGB

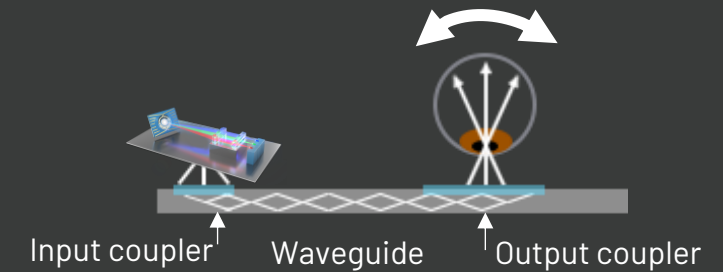


Future proof:

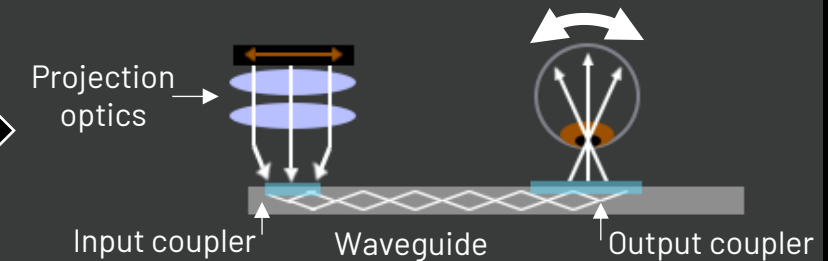
- Can be adapted with regards to spec items or new features (e.g., eye tracking)

Scanning-Based Display Trixel® 3 LBS

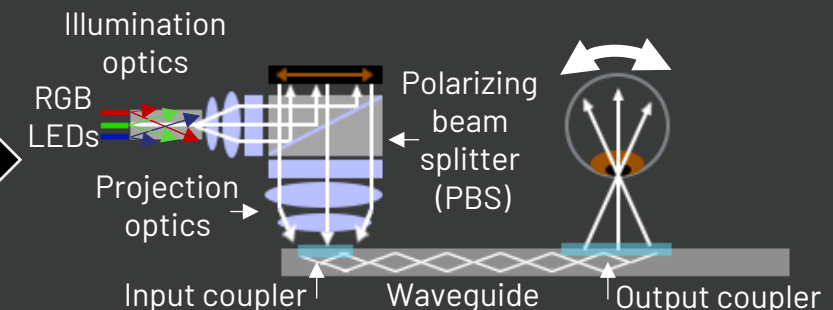
- ✓ Smallest
- ✓ Lightest
- ✓ Brightest



Panel-Based Displays (self-emissive) μ LED & OLED

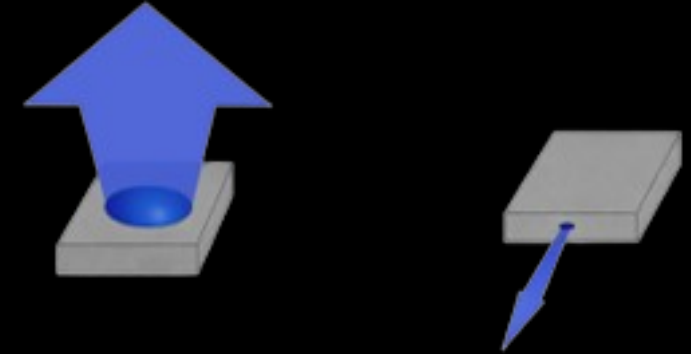


Panel-Based Displays (reflective) LCoS & DLP



LBS has fundamental advantages over LED-based light engines

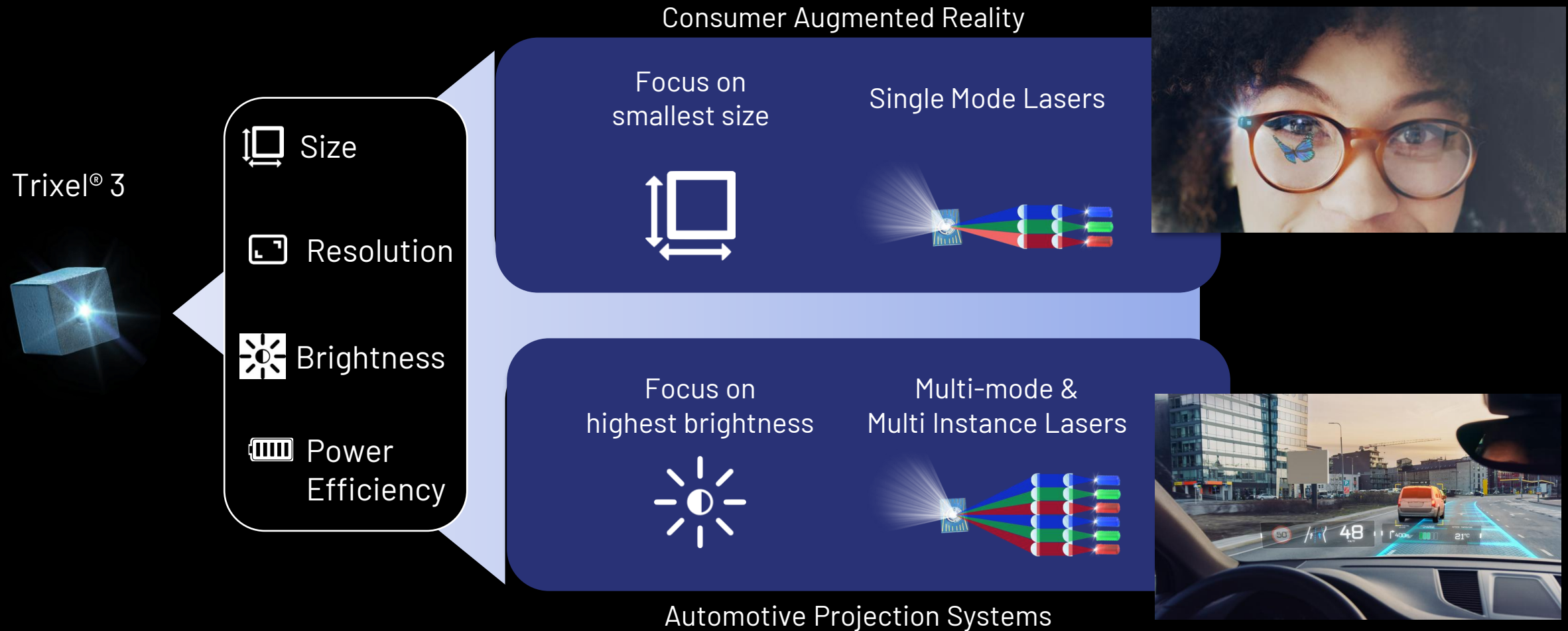
- LBS is superior on size, weight, power, and cost (SWaP-C)
- Low étendue single-mode LD sources enable **more compact designs** for LBS systems
- **Single-mode LDs provide substantially higher WPE** within an emission cone that is compatible to the system optical design
- Polarized narrow-bandwidth light provides unique advantages
 - Polarized light provides **higher coupling efficiencies** and better performance in WG systems
 - **Higher color gamut** of 214% sRGB
- **Dynamic FOV scaling and foveation**



LEDs (μ LED, OLED, LCoS, DLP)	Lasers (LBS)
Spontaneous emission	Stimulated emission
Broad bandwidth	Narrow bandwidth
Unpolarized	Polarized
Large étendue	Small étendue
Low WPE	High WPE

Scaling one platform to unlock diverse market opportunities

Our versatile projection display is used in markets beyond consumer



We have developed a novel cube-shaped LBS architecture

Trixel® 3 Cube target specifications (*production design*)



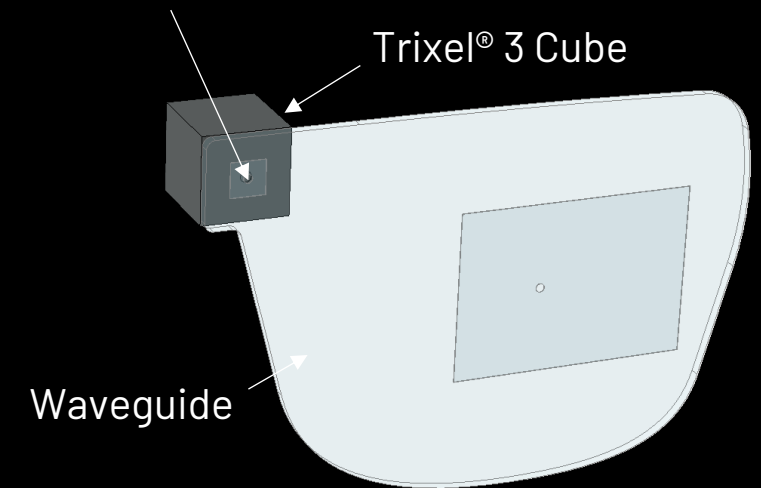
Volume		$\approx 0.8 \text{ cm}^3$
Weight		$\approx 1.7 \text{ g}$
FOV		$\geq 40^\circ$
Resolution		Up to 700 x 400
Refresh rate		up to 60 Hz
MEMS mirror type		1 x 2D mirror
Max. luminous flux at LBS output ¹		$\leq 15 \text{ lm}$
Brightness at waveguide output ²		6000 nits
Power consumption ³		145 mW
Color gamut		214% sRGB
Contrast ⁴		$> 500.000 : 1$

MEMS ... Micro-electro-mechanical system
FOV ... Field of view
WG ... Waveguide

Our cube architecture provides unique advantages

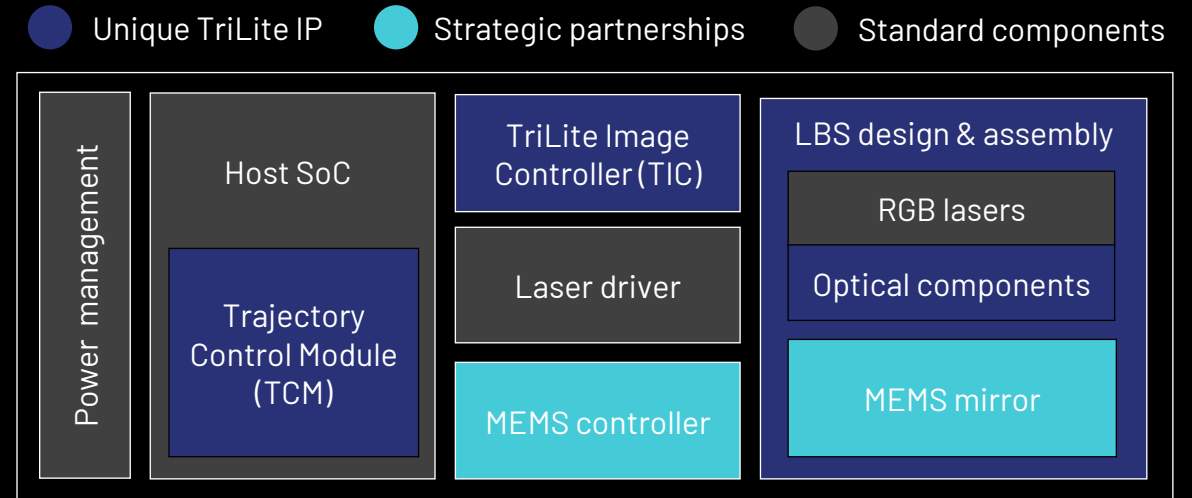
- **No additional optics required** (direct WG coupling possible)
- **No additional heat sinks required**
- **Inherent ghost image suppression** without tilting of Cube
- Easily adjustable to any **pantoscopic and face wrap tilt angles** (no increase in volume)
- Polarization can be adjusted to match WG requirements
- **Symmetric design** enabling binocular AR glasses

Direct WG coupling possibility:
No optics between MEMS mirror
and WG input coupler

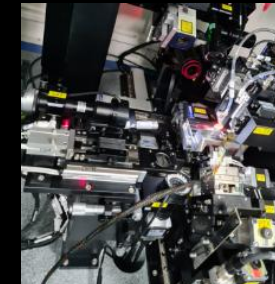


We have teamed up with world leaders to ensure high volume manufacturability

- **Enabling and qualifying** high volume **contract manufacturers**
- Maximizing the use of **standard components and equipment**
- Integrating **proprietary single process know-how** to establish a proven manufacturing flow
- **Certifying LBS to an automotive standard** through supplier and final product verification
- **Delivering a complete solution** in cooperation with partners



Automotive-qualified
assembly locations



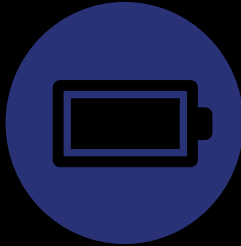
LBS is outperforming competitors in key performance metrics for consumer AR

		Projection	Displays bounded by screen		
Key Parameters		LBS	μLED	LCoS	
	Small form factor / low weight				
	Color Gamut				
	Low power consumption				
	High brightness & contrast				
	FOV				

- Current Technology Status
- Next Generation Technology (small size, high resolution, brightness & FOV, full-color RGB)

Our Trixel® LBS platform is scalable to next-gen AR glasses

INCREASE CHARGING INTERVALS



"Moore's law" provides more processing at lower power for 'Software Defined Displays'

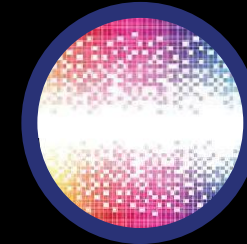
Next generation laser sources and optical combiners

SEE MORE WITH WIDER FOV

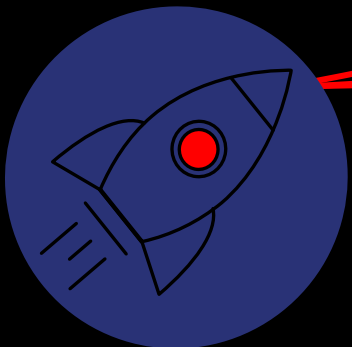


Next generation optical combiners and MEMS mirrors

WIN THE "MEGA-PIXEL-RACE"

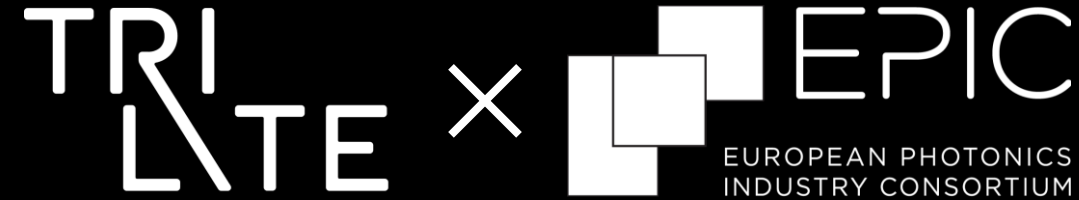


Multi-emitter light sources enable higher resolution and higher refresh rate



FUTURE PROOF

We are looking for collaboration options in the AR and automotive fields



- **LBS components**

- Laser diodes
- Photonic integrated circuits (PIC)
- MEMS mirrors
- Refractive micro-optics
- Advanced micro-optics (meta structures, diffractive optics, polarization optics, etc.)
- Driving electronics (laser diode drivers, etc.)

- **AR system components**

- Waveguides and other optical combiners (holographic, etc.)
- Host platforms

- **Metrology systems**

- **Manufacturing partners**



Thank you for your attention!

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