

A Window into the Metaverse: The Power of Nanolmprint Lithography to achieve a robust Diffractive Lightfield BackLighting (DLB™) for next gen Lightfield displays

Jan 24th, 2022

Sonny Vo, Ph.D

Vice President, Leia Inc.

What We Do:

Leia Inc is an experience platform offering 3D Lightfield products and software applications that challenge the limits of what can be created and shown on a display screen.

What We Do:

Leia's disruptive, award winning, and world's first Lightfield tablet, the Lume Pad.

What we are looking for at EPIC:

Leading brands in the automotive, education, gaming, hospitality, medical, and retail industries are embracing Lightfield as the de facto medium to connect with their consumers and re-define their marketplaces. **We look forward to partnering with you and-or your extended networks interested in our 3D Lightfield products.**



Switchable Lightfield Displays.

"This new display is transforming a technology that's been around for 100 years."

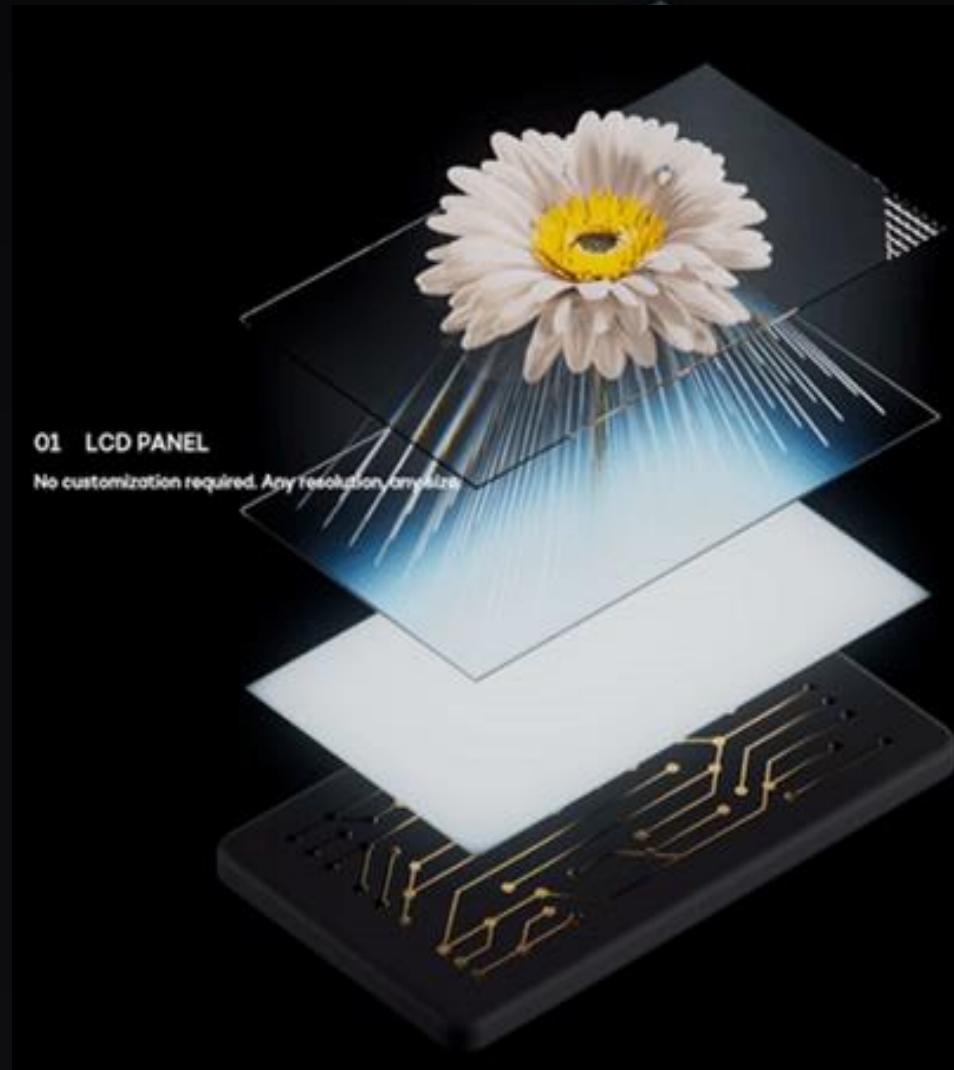
Forbes

**MIT
Technology
Review**

"Leia, the future of displays."



528 patents
filed to date



Regular LCD panel

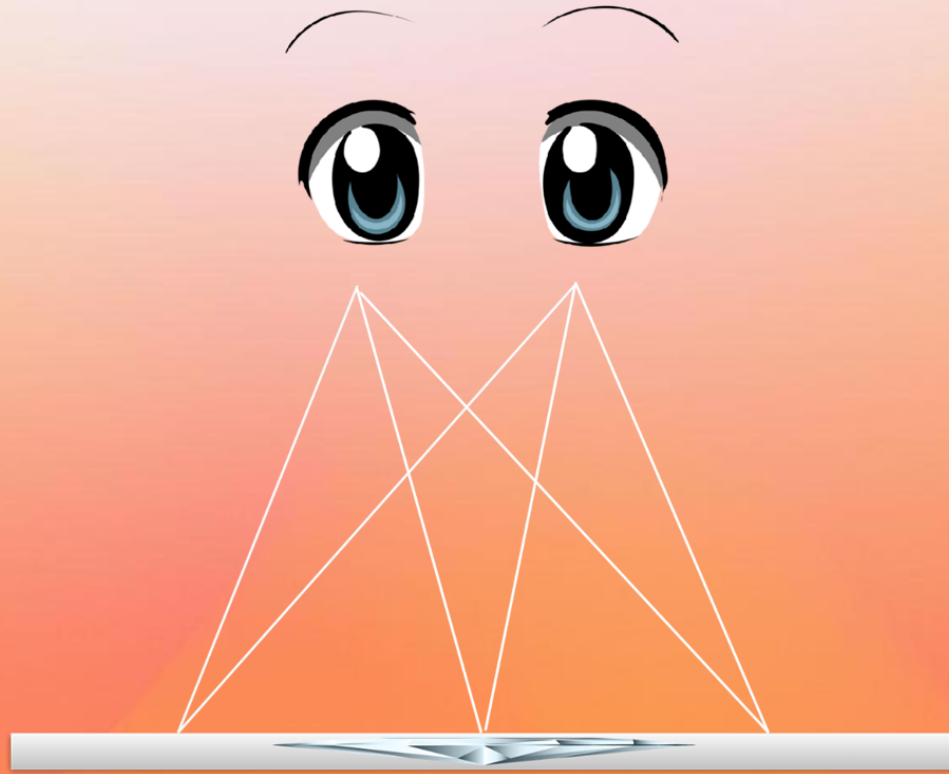
Proprietary DLB™ Layer
(Lightfield Mode)

Regular 2D Backlight
(2D Mode)

Standard Device Board
SoC, Application Processor

2D

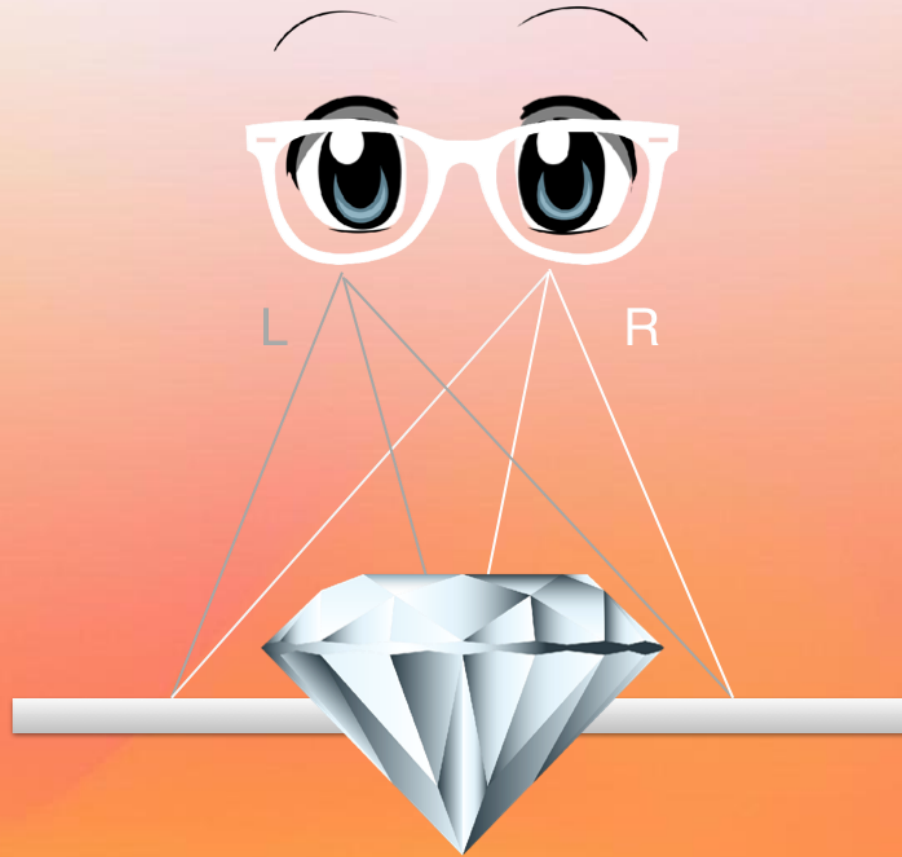
Flatland...



x

3D

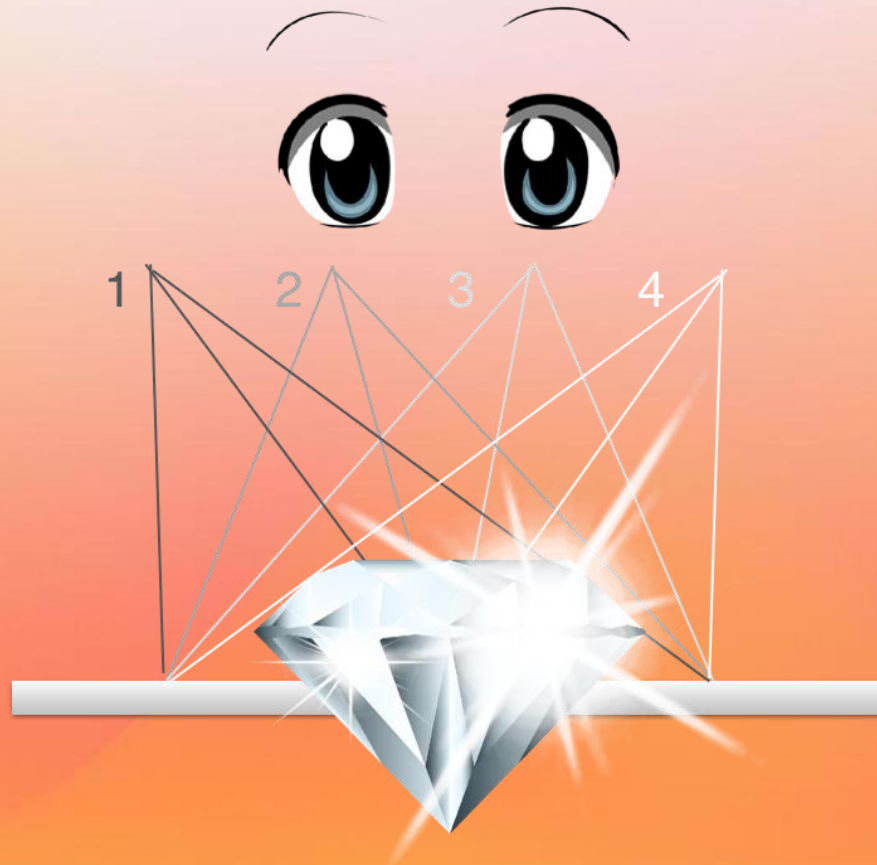
Gaining Depth...



x

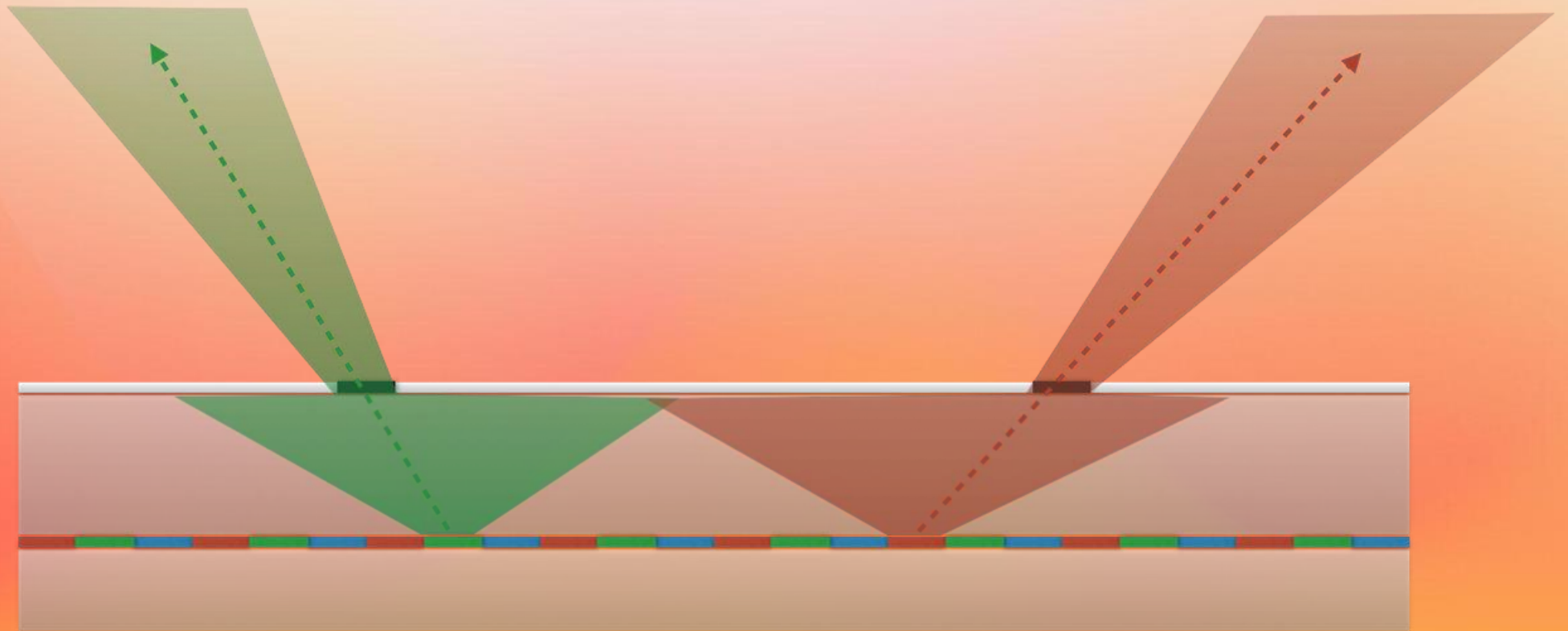
Lightfield

The whole deal...

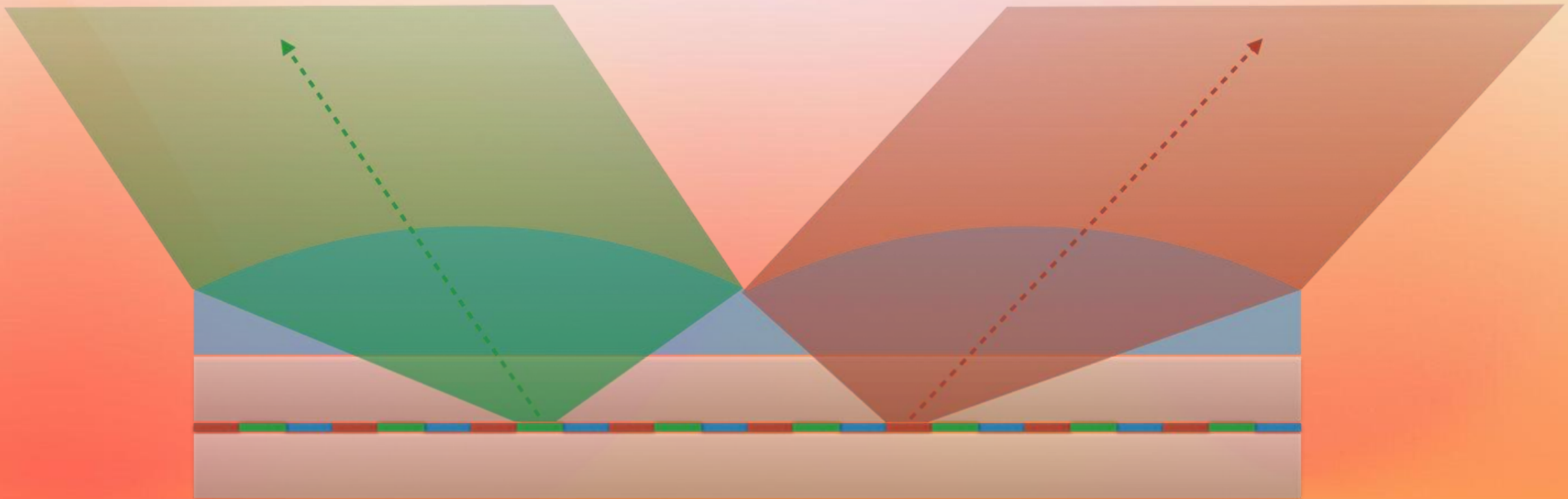




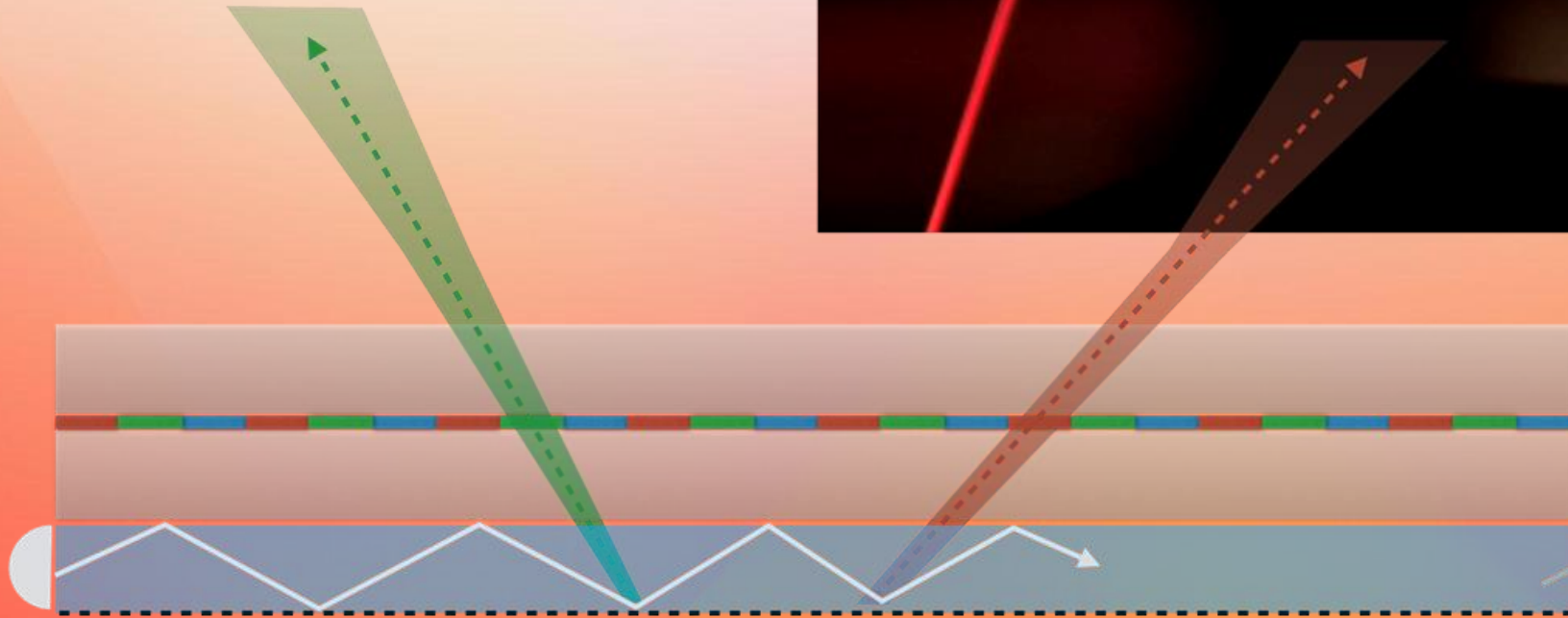
Parallax Barrier



Lenticular



Diffractive LightField Backlighting (DLB™)

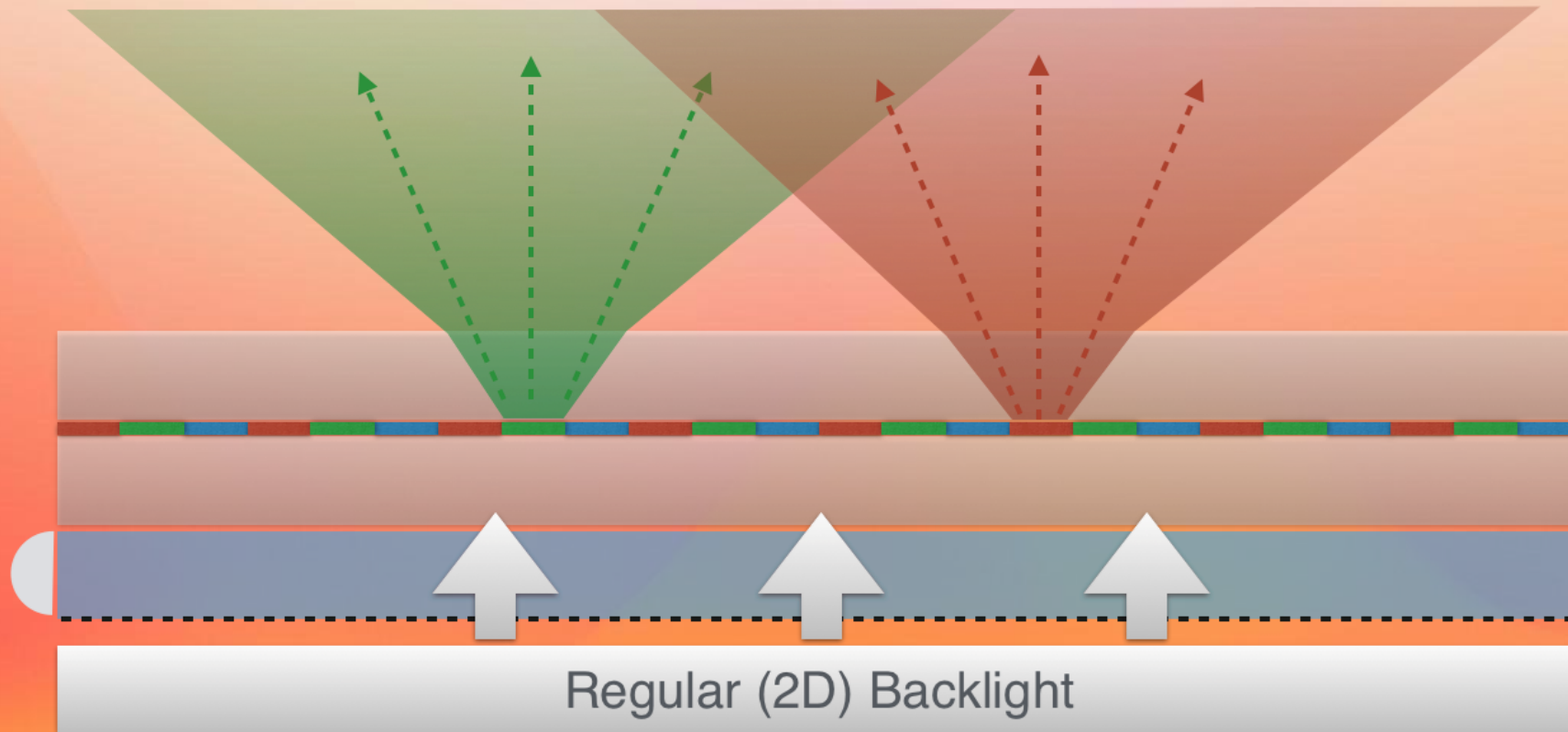


LeiaGlo.

Transparent "Hologram"



DLB™ => 2D mode





MENLO PARK, CA

PALO ALTO, CA

LOS ANGELES, CA

NEW YORK, NY

AUCKLAND, NEW ZEALAND

SUZHOU, CHINA

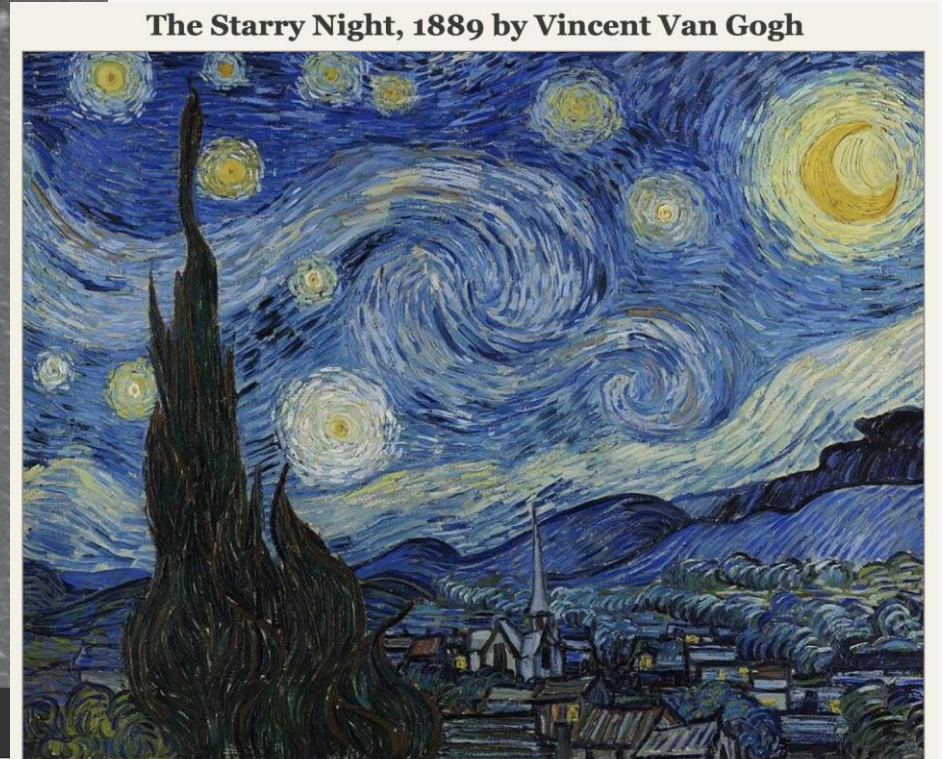
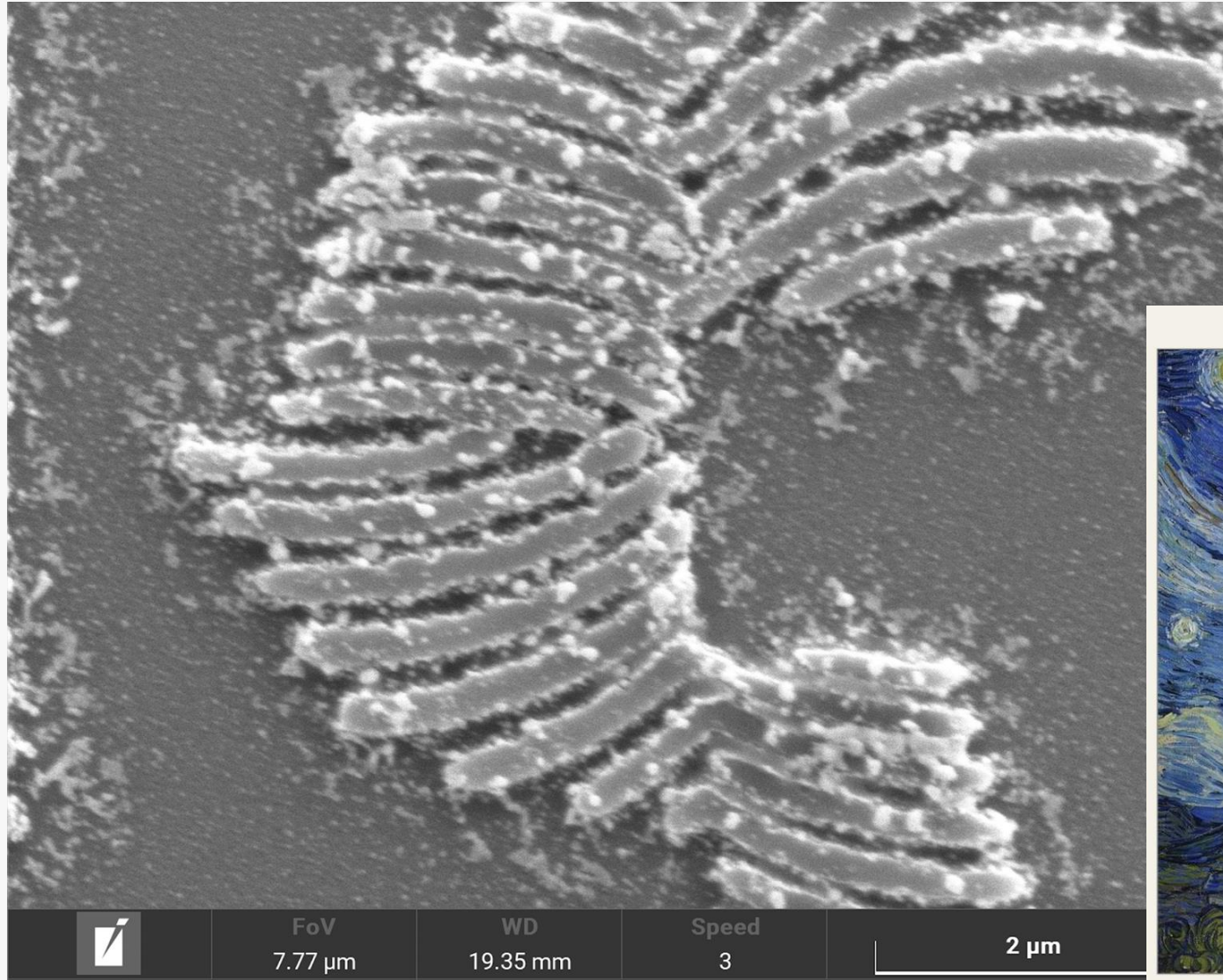
SHANGHAI, CHINA

Our global offices enable us to specialize in R&D, product design, technology, content, software development and manufacturing.

Our internal foundry enables us to cycle ideas to nanofabrication to imprint and measurement within a 2 weeks cycle → 100s of ideas and improvements per quarter.

High Compactness & Large Areas are two of the most challenging frontiers in modern nanotechnology: we have to conquer both in Leia Inc

The scary night, 2021



High Compactness & Large Areas are two of the most challenging frontiers in modern nanotechnology: we have to conquer both in Leia Inc

Nanograting fields near NewWahh, 2021



SEM image, courtesy: Emeline Soichi, Leialnc

Wheat Fields near Auvers 1888 by Vincent Van Gogh



Lit by Leia™



FoV
14.8 μ m

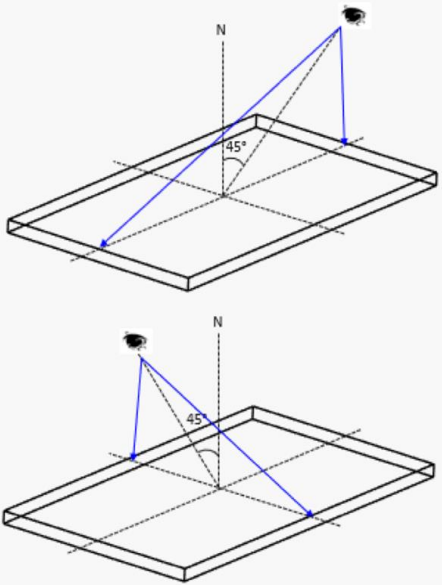
WD
16.58 mm

Speed
3

2 μ m

Defectivity & HHO lifetime: **Robust LightGuide**

Inspection angle: vertical to center of AA surface as 0°, Light on images should be inspected within $\pm 45^\circ$

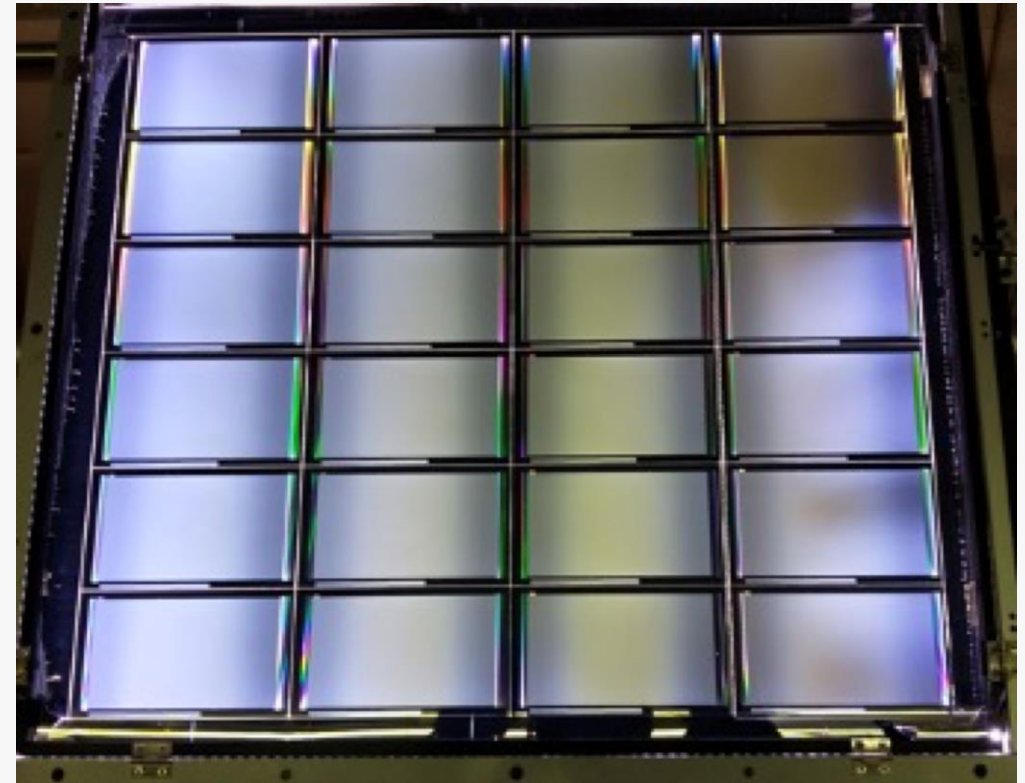


Imprint Inspection Item	Specification	Allowable number of defects	Distance
Dot Defects	$D \leq 0.1\text{mm}$	no limit	
	$0.1 < D \leq 0.20\text{ mm}$	3	10mm
	$D > 0.20\text{mm}$	0	
Pitting dot	$D \leq 0.05\text{mm}$	$N \leq 20$, within Viewing angle above 15 Degree	20mmX20mm, max 2 islands in one screen
Bubble Dot	Fix position	0	
	Random position	Refer to Dot Defect spec	
Black Dot		0	
Line Defects	$W < 0.02\text{mm}$	no limit	
	$0.02\text{mm} < W \leq 0.1\text{mm}$, $L \leq 3.0\text{mm}$	2	5mm
	$W > 0.1\text{mm}$ or $L > 3\text{mm}$	0	
White/Black Dirty	Erased by solvent	no limit	
	Not erased by solvent	Collect data to verify	
Dimple/Pimple	Refer to limit SPL		
Mura (Vertical / Stripe)	Refer to limit SPL		
Pin Mark	Erased by solvent	no limit	
	Not erased by solvent	Refer to limit SPL	
UV Missing	Extend to AA zone	0	

Defectivity & HHO lifetime: **Robust LightGuide**

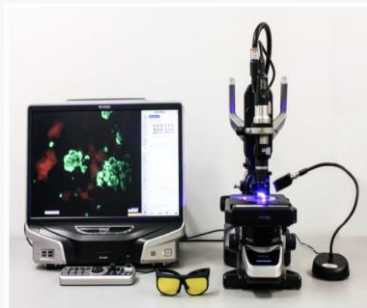
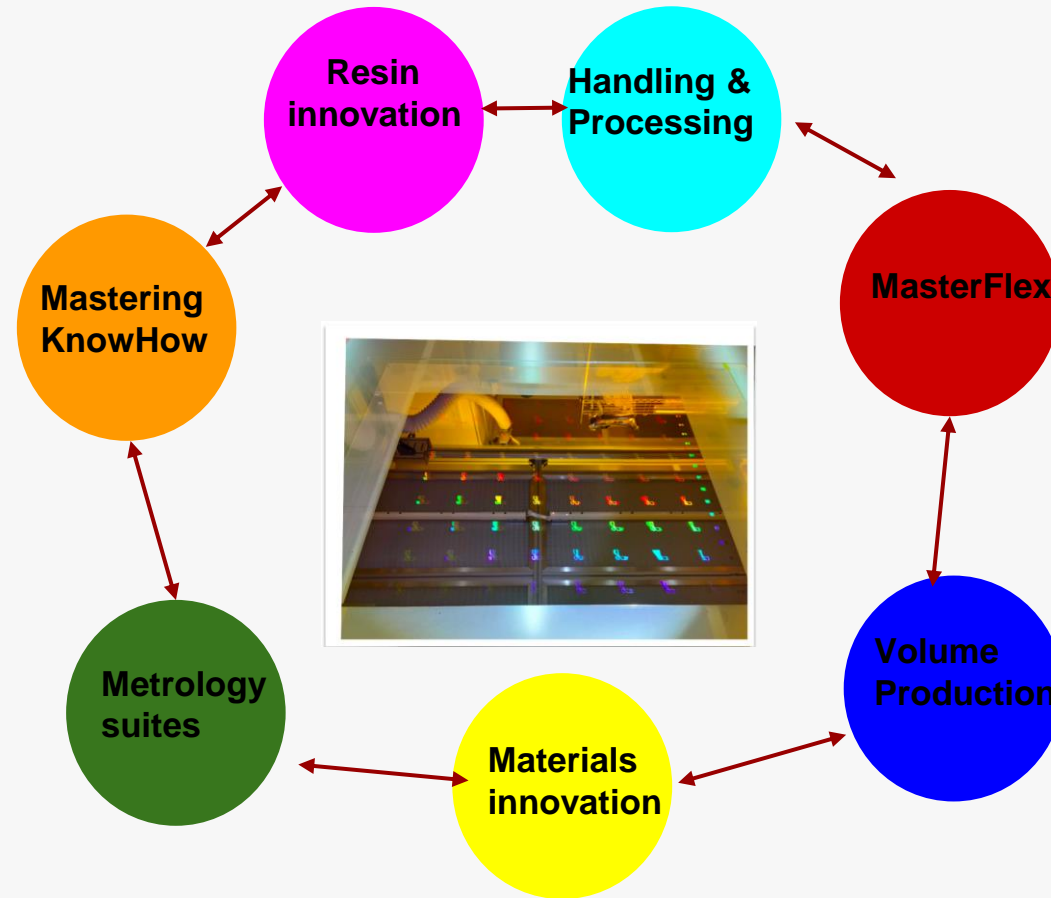
Examples of some industry-accepted RAs our products pass:

- High Temp Operation (240H 70C)
- Low Temp Operation (240H -20C)
- High Humidity Operation (88H 90%RH 60C)
- >90% product yield based on strict display industry defect criteria



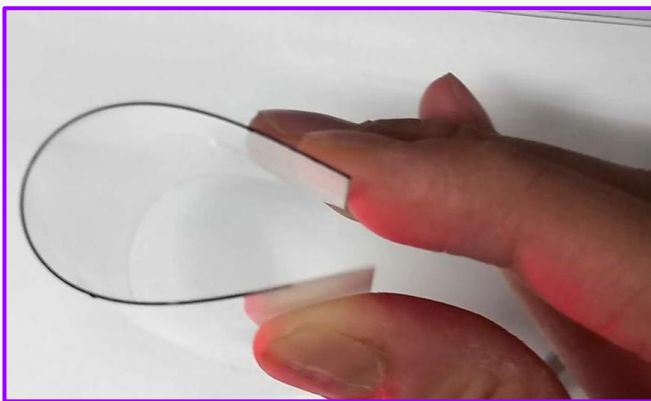
Multiple factors to contribute to reliability

...and repeatability of product when it comes to Leia Inc's nanotechnology and nano-imprint technologies. These factors directly affect Yield, Output and Product quality.

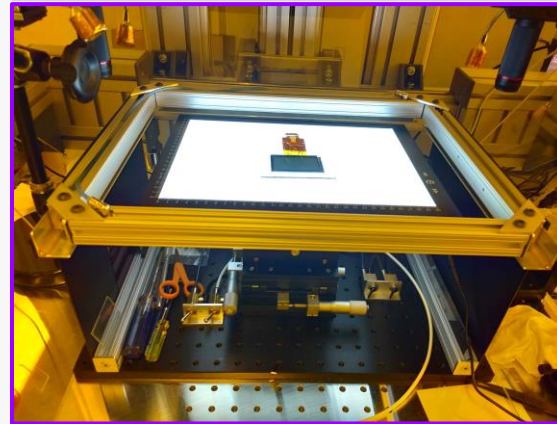
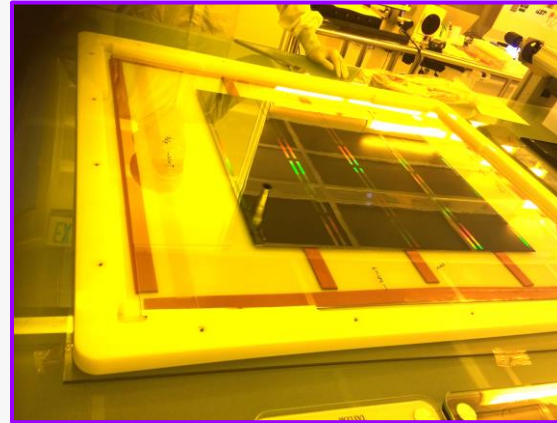


Total solutions capabilities

In house A-to-Z production line *as well* as a global network of longstanding partnerships



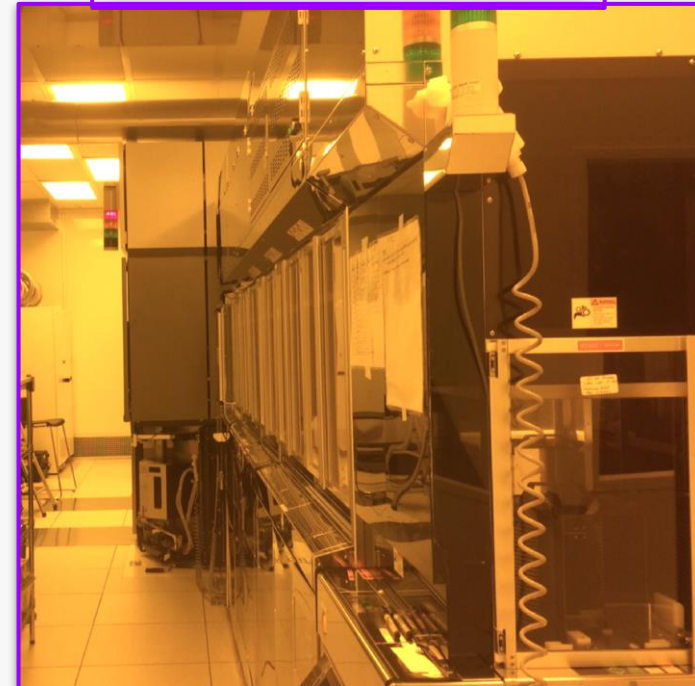
Glass wafers, Silicon,
to flexible plastics



Rapid home built custom
assemblies for fast prototyping for
partners and customers



MarkII P5000
AMAT Dual
Chamber Etcher



In-line ASML
DUV
Twinscan:
Production
8" and 12"
asset

The LumePad: Break through

3D LightField Technology



**Easily integrate Lightfield interaction
and experiences into your business**



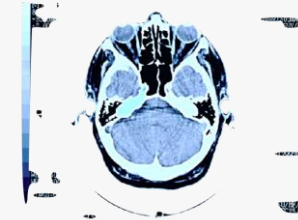
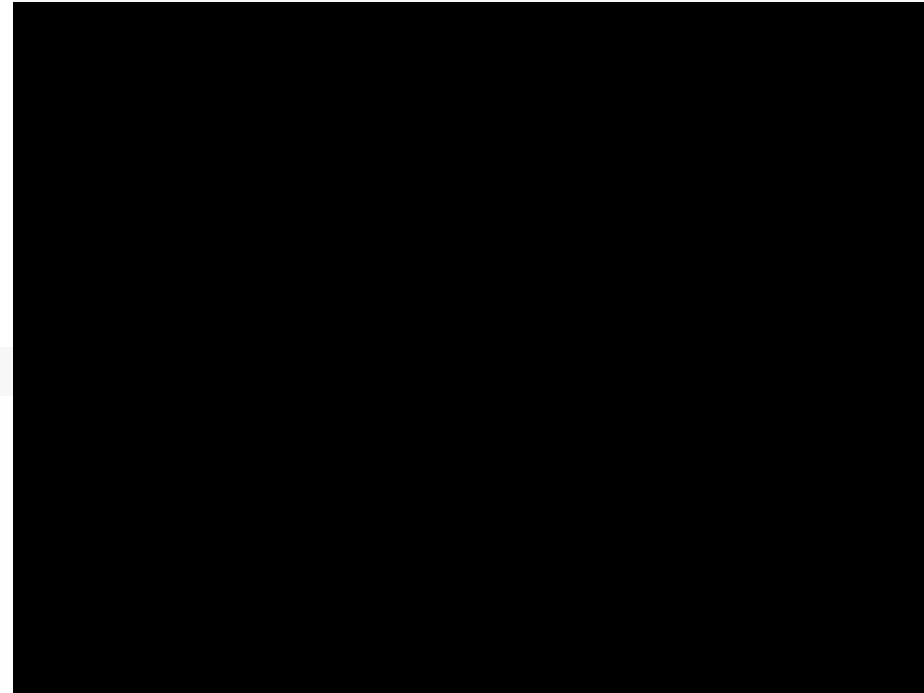
<https://www.lume-pad.com/>

<https://shop.leiainc.com>

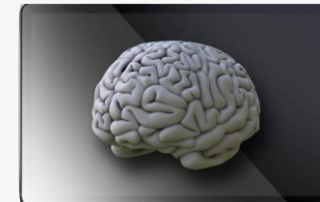
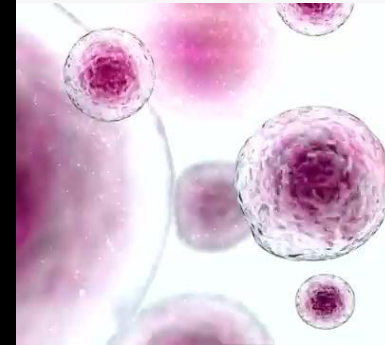
<https://www.leiainc.com/products/lume-pad/>

Leia Inc's 3D LightField Technology: a platform for the future of visualization

3D LightField Technology applications and immersions



Medical File
(CT, MRI...)



Interactive
Lightfield
Viewing

<https://www.leiainc.com/products/lume-pad/>

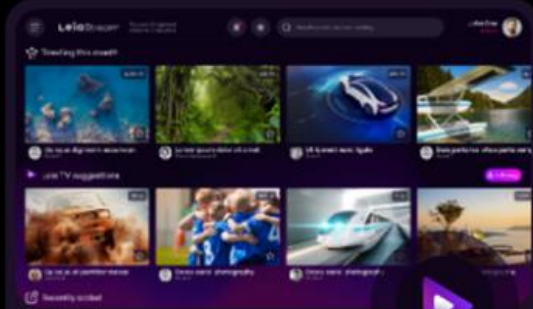
<https://www.lume-pad.com/>



Leia Inc Software Suite: Core Lightfield Apps

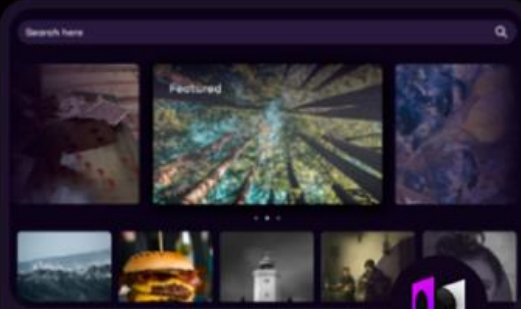
make any content come alive
in 3D

Lit by Leia™



LeiaStream

Explore amazing 3D videos on Leia's new streaming network built for everything you create.



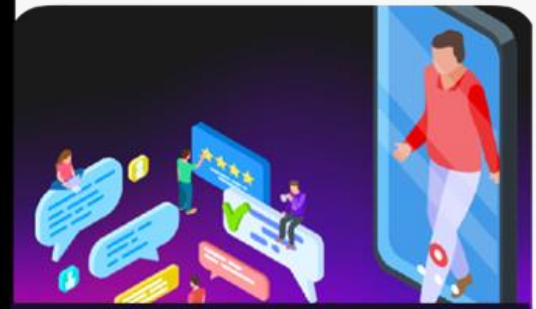
LeiaPix

The #1 social network with 100,000 Lightfield images. Join an active community of fellow creators.



LeiaPlayer

Playback, quickly touch up, or even convert old 2D photos into beautiful 3D on the Lume Pad.



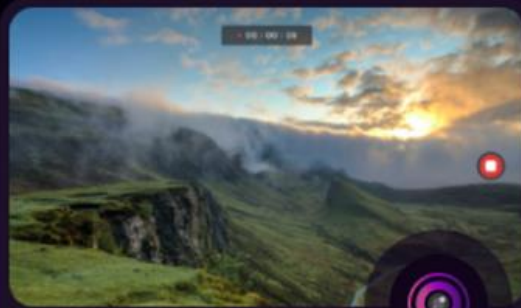
LeiaLink

Next gen communication app, share 3D pics and videos and chat live in 3D with any device thanks to real-time 2D3D conversion technology !



LeiaLoft Store

Experience a wide array of 3D games and apps. Get inspired and see what you can create.



LeiaCam

Paired with the Lume Pad's hardware, capture 2D or stunning 4V / 3D photos and video.



LeiaViewer

See 3D models in a whole new way thanks to the Lume Pad. Access over 500,000 free models on Sketchfab.



LeiaFrame

Turn your device into a photo frame

We are hiring and growing... Thank you for your support!

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<https://www.leiainc.com>

<https://www.lume-pad.com/>

jobs@leiainc.com