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AMIRIS

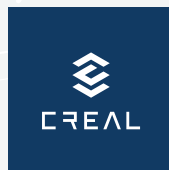


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PARTNERS



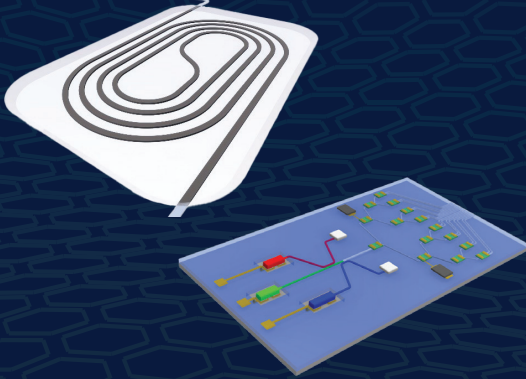
**PZT AND GRAPHENE
MATERIALS INNOVATIONS
FOR ADVANCED
OPTO-ELECTRONIC
APPLICATIONS IN AR AND
BIOSENSING**

**MatEl introduces a novel, on-chip
integration scheme enabling
accurate and fast alignment and
bonding of any type of chip
package on Si₃N₄. MatEl will
combine laser transfer and laser
soldering to demonstrate hybrid
platforms, which will be enhanced
by the monolithic integration of
advanced materials – graphene
and high-quality PZT.**

1

Si3N4 Platform design and manufacturing

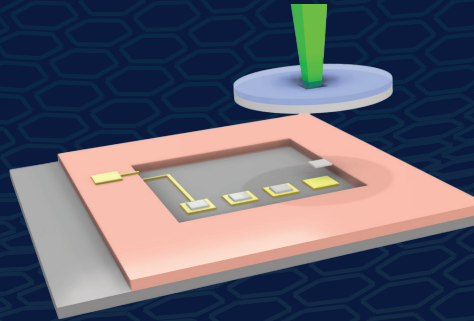
Si3N4 platform on 4-inch wafers, with micromachined pockets for integrating active components and employing direct E-beam lithography and flip-chip bonding techniques to support miniaturization.



3

2D material integration

Wafers planarization and LIFT deposition of graphene pixels for on-chip photodetectors. Integrating PZT and AlScN demultiplexers on the Si3N4 platform using advanced deposition techniques, with optimization for high performance.



5

Light-field AR display

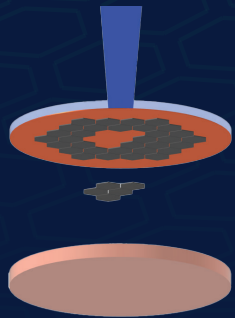
Integration and validation of 2D light source for light-field AR display with on-chip RGB lasers and OEIC-based demultiplexer.



2

Graphene growth and laser transfer

Growth of high-mobility graphene, through Chemical Vapour Deposition. Optimization of the process for LIFT printing, while refining the LIFT technology to ensure high-quality laser transfer of graphene pixels onto the Si3N4 platform.



4

OEIC Packaging and Assembly

Using flexible handling and alignment techniques, with joining methods and modular processes to ensure high throughput and traceability, supporting the assembly of the advanced devices.



6

Biophotonic Sensor

Test and validation of biophotonic sensing for Covid-19 antibodies detection integrated on-chip.

