

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Date of Report
(Date of earliest event reported): October 30, 2024

Aeluma, Inc.
(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction
of incorporation)

000-56218
(Commission File Number)

85-2807351
(IRS Employer
Identification No.)

27 Castilian Drive
Goleta, California
(Address of principal executive offices)

93117
(Zip Code)

805-351-2707
(Registrant's telephone number, including area code)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act: none.

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Item 8.01 Other Events.

We are filing this report to disclose our new investor PowerPoint presentation. The presentation is furnished as an exhibit to this Current Report on Form 8-K.

Neither this report nor the exhibit attached hereto constitute an offer to sell, or the solicitation of an offer to buy our securities, nor shall there be any sale of our securities in any state or jurisdiction in which such offer, solicitation or sale would be unlawful prior to the registration or qualification under the securities laws of any such state or jurisdiction.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits.

Exhibit Number	Exhibit
99.1	PowerPoint Presentation
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

AELUMA, INC.

Date: October 30, 2024

By: /s/ Jonathan Klamkin
Jonathan Klamkin
President, Chief Executive Officer, and Director



Forward Looking Statements



This presentation contains summary information about Aeluma, Inc. ("Aeluma") as of the date hereof. The information in this presentation is of general background and contains an overview and summary of certain data selected by the management of Aeluma. It does not purport to be complete.

This presentation is not a prospectus, disclosure document or offering document under the law of any jurisdiction. It is for informational purposes only. This presentation is not investment or financial product advice (nor tax, accounting or legal advice) and is not intended to be used for the basis of making an investment decision. A recipient must make their own independent investigations, consideration and evaluation of Aeluma and the offer and Aeluma recommends that investors should obtain their own professional advice before making any investment decisions in the company. This investor presentation shall also not constitute an offer to sell or the solicitation of an offer to buy any securities, nor shall there be any sale of securities in any states or jurisdictions in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such jurisdiction. No registered offering of securities shall be made except by means of a prospectus meeting the requirements of section 10 of the Securities Act of 1933, as amended.

This document has been prepared based on information available at the time of presentation. No representation or warranty, express or implied, is made as to the fairness, accuracy or completeness of the information, opinions and conclusions contained in this presentation or any omission from this presentation or of any other written or oral information or opinions provided now or in the future to any person. While reasonable care has been taken to ensure that facts stated in this presentation are accurate and/or that the opinions expressed are fair and reasonable, no reliance can be placed for any purpose whatsoever on the information contained in this document or its completeness.

To the maximum extent permitted by law, neither Aeluma nor their respective officers, directors, employees, advisors and agents, nor any other person, accepts any liability as to or in relation to the accuracy or completeness of the information, statements, opinions or matters (express or implied) arising out of, contained in or derived from this presentation or any omission from this presentation or of any other written or oral information or opinions provided now or in the future to any person.

Some of the statements appearing in this presentation are in the nature of forward looking statements. You should be aware that such statements are predictions based on assumptions, and are subject to inherent risks and uncertainties. Those risks and uncertainties include factors and risks specific to the industry in which Aeluma operates as well as general economic conditions, prevailing exchange rates and interest rates and conditions in the financial markets and other factors that are in some cases beyond Aeluma's control. As a result, any or all of the Aeluma's forward-looking statements in this presentation may turn out to be inaccurate and actual results may be materially different than those expressed in such forward-looking statements. Except as required by law, we are under no duty to update or revise any of the forward-looking statements, whether as a result of new information, future events or otherwise, after the date of this presentation. These forward-looking statements speak only as of the date of this presentation, and we assume no obligation to update or revise these forward-looking statements for any reason.

At a Glance



Aeluma develops high performance semiconductors that scale for consumer markets.



Headquarters: Santa Barbara, California



Team: 15

OTCQB ALMU	
Share Price ¹	\$3.58
Market Cap. ¹	\$43.69M
Shares Outstanding ¹	12.18M
¹ At June 30, 2024	

\$1.5B SAM in 2030
InGaAs sensors

Broad Applicability

26+

ISO 9001:2015

SAM growing from \$240M in 2025

Expanding marketing in Mobile, AI, Quantum Computing, AR/VR, Communication, Biomedical, 5G/6G

Issued and pending patents

Quality Management System Certification

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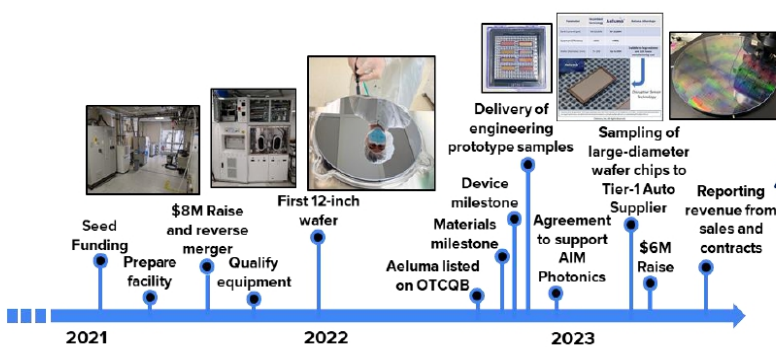
SAM based on InGaAs (indium gallium arsenide) sensors in selected defense & aerospace, mobile/consumer, automotive, other; Estimates based on internal assumptions and reports including from www.futuremarketinsights.com.

3

Timeline and Milestones



Aeluma Reporting Revenue from Multiple Customers



Revenue Reported

Achieving revenue after ~2 years from our initial private placement financing

- Aeluma began to recognize revenue from its products in fourth fiscal quarter ended June 30, 2023 (see 10-K filed on September 25, 2023) and has reported revenue every quarter since
- Revenue generated primarily from small-volume orders and development contracts

Aeluma has met or beat all of its milestones

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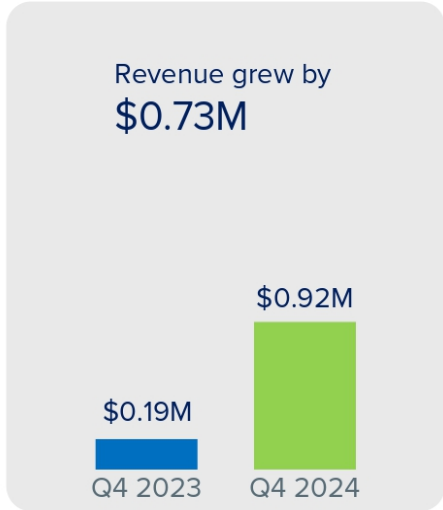
Past performance is not indicative of future performance. Outcomes cannot be guaranteed.

4

Fiscal Q4 2024

Financial Highlights

Revenue



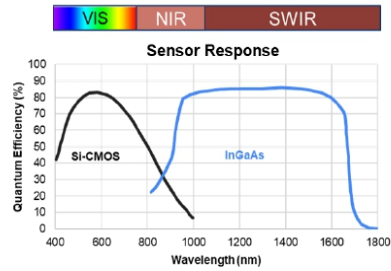
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Note: Outcomes cannot be guaranteed. Forecast is based on internal projections.

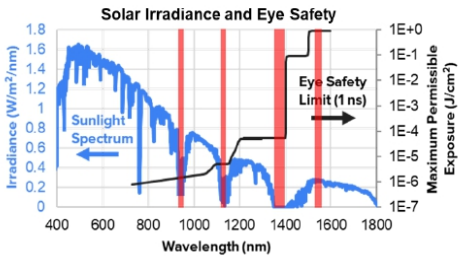
Why Aeluma and Why Now?

Shortwave Infrared (SWIR) Sensors Needed for Consumer Markets

What is SWIR?



SWIR sensors needed for eye safety and other benefits



Radical approach required to scale and reduce cost

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VIS: Visible; NIR: Near infrared; SWIR: Shortwave Infrared; Source of figures: Rep. Prog. Phys. 85, 12 (2022).

Technology Portfolio



- Detector Arrays
- Large-area Detectors
- Quantum Dot Lasers
- Heterogeneous Templates

Aeluma™
High Performance Semiconductors that Scale

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Aeluma™ Shortwave Infrared Detector Arrays

Aeluma™ Large Area InGaAs Detectors

Custom Array Specifications

Specification	Min.	Typ.	Max.	Unit
Wavelength	1.0	1.5	2.0	µm
Area	1	10	100	cm²
Quantum Efficiency	50	60	70	%
Peak Sensitivity Wavelength	1.05	1.55	2.05	µm
Detector Type	PIN or APD			
Substrate	Commercial or custom substrate			

Performance, Formats and Features

- Low dark current (photoconductor arrays manufactured with large-diameter substrate platform)
- Pixel and array size customizable
- Typical array sizes: 128 X 128, 256 X 128, 448 X 112
- Reliability performance across various geometries
- Delivered as FOC, chip or with BOCs
- FPA assembly available
- Special array sizes & BOCs available for most liquid

Focal Plane Array Assembly

Heterogeneous Integration Platform

Aeluma's proprietary heterogeneous integration platform integrates high-performance compound semiconductor (GaAs, InP, GaSb) on large-diameter substrates, including up to 12-inch Silicon.

This technology has the potential to scale, reduce cost, and increase yield, all of which are critical for emerging and mass-market applications.

Summary of Offerings

High Quality Templates

High quality GaAs, InP and GaSb templates grown on up to 12-inch Silicon substrates to enable high performance, reliable, and low cost large area arrays.

Monolithic Integration by Selective Growth

Selective growth enables GaAs, InP and GaSb integration with Si on Si substrates to enable high performance, reliable, and low cost large area arrays.

Large Scale Detectors for Wafer Scale Integration

Manufacturing detectors on the same substrate as silicon enables high performance, reliable, and low cost large area arrays.

Lasers for Silicon Photonics

Integration of quantum dot lasers and other growth on silicon enables Silicon Photonics for data centers, AI, and more.

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7

Aiming to Service a Broad Market

High Performance Semiconductors That Scale



<p>Mobile and AR/VR</p> <ul style="list-style-type: none"> • Mobile phone, tablet • Face ID • LiDAR scanner • Proximity sensors • AR/VR glasses 	<p>Communications, Quantum and AI</p> <ul style="list-style-type: none"> • Data centers and AI • Telecommunications • Quantum computing • 5G/6G wireless 	<p>Defense & Aerospace</p> <ul style="list-style-type: none"> • Imaging and LiDAR • Security • Autonomous systems • Atmospheric sensing • Topography 	<p>Automotive LiDAR</p> <ul style="list-style-type: none"> • Consumer vehicles • Robotaxis • Trucking 	<p>Industrial and Logistics</p> <ul style="list-style-type: none"> • Robotics • Delivery robots • Factory automation • Logistics • Security
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Aeluma positioned as a technology provider to service broad range of market verticals

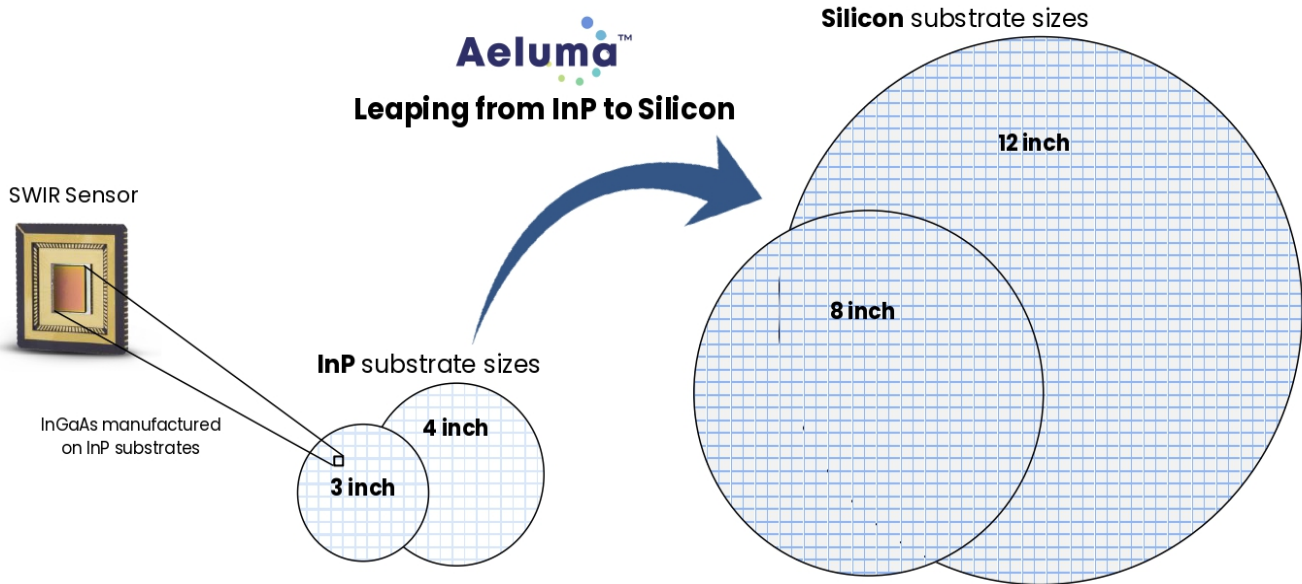
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Market sizes based on internal studies and projections for 2030.

8

The Aeluma Approach to Semiconductor Manufacturing

High Performance Technology with Large-Diameter Substrate Manufacturing



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InGaAs: Indium Gallium Arsenide; InP: Indium Phosphide;
Source of image: <https://www.flir.com/support/products/swir-ingaas-fpa/>; Note: Outcomes cannot be guaranteed.

9

Aeluma's Technology Breakthrough

Scalable, Cost-Effective Manufacturing Enabled by Cutting-Edge Intellectual Property



Conventional manufacturing of InGaAs semiconductor devices

Non-scalable, manual and low throughput

Aeluma high performance InGaAs with Silicon manufacturing

Moving from 3-inch to 12-inch wafers
16X wafer area

- ✓ Highly automated and ability to produce many devices per wafer
- ✓ Monolithic CMOS process integration
- ✓ Wafer-scale integration and packaging
- ✓ 10X lower manufacturing cost for mass market applications

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Note: Outcomes cannot be guaranteed.

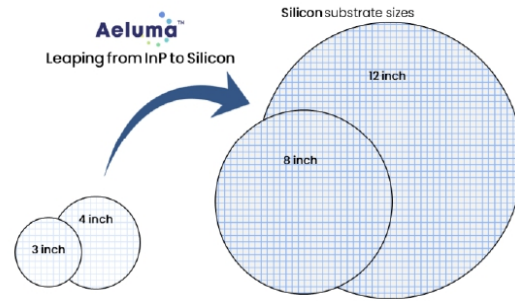
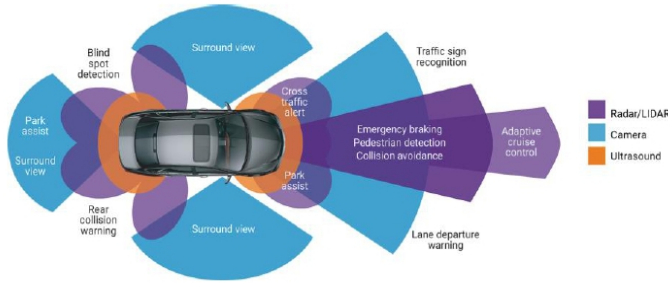
10

Manufacturing for a Mass Market



Aeluma's Large-Diameter Manufacturing Economies of Scale

Cars will have Radar, LiDAR, and Camera sensors



- **Market: 113 million automotive vehicles in 2024¹**
- **Each vehicle may have 1-5 LiDAR sensors**
- **Note: Some LiDARs require more than 1 FPA**

Example case: Manufacturing 20,000,000 sensor chips for LiDAR

Substrate Size	Number of wafers required	Number of chips per wafer
3-inch	425,532 wafers	47 chips per wafer
4-inch	212,768 wafers	94 chips per wafer
8-inch	42,824 wafers	467 chips per wafer
12-inch	17,700 wafers	1,130 chips per wafer

Aeluma's manufacturing approach can enable the scaling and cost reduction required for mass market applications.

© Aeluma, Inc. All Rights Reserved. LiDAR: Light Detection and Ranging; Note: Outcomes cannot be guaranteed. Values are provided for qualitative illustration purposes only. ¹www.idc.com. Source of car/sensors figure: <https://www.eetimes.com/why-sensor-technology-is-the-key-to-autonomous-vehicles/>

Aeluma Outperforms the Competition



Technology Comparison

	Incumbent technologies		Technologies for scaling and cost reduction		
Technology:	Si SPAD	InGaAs-on-InP	Ge-on-Si	CQD	InGaAs-on-Si
Substrate size:	8 to 12 in.	2 to 4 in.	8 to 12 in.	8 to 12 in.	8 to 12 in.
Suppliers:	SONY	HAMAMATSU EXCELITAS TECHNOLOGIES	ARTILUX TRIEYE	onsemi SWIR	Aeluma™
Eye Safe:	No	Yes	Somewhat	Somewhat	Yes
Performance:	Good	Best	Fair	Fair	Best
Multiplication (APD, SPAD):	Yes	Yes	Possible	No	Yes
Wafer-scale integration:	Yes	No	Yes	Yes	Yes
Status:	Mature Scalable	Mature Not Scalable	Maturing Scalable	Maturing Scalable	Maturing Scalable

Aeluma's is the only known technology that combines proven, high-performance InGaAs with scalable, cost-effective Silicon manufacturing, thereby overcoming the cost-performance tradeoff.

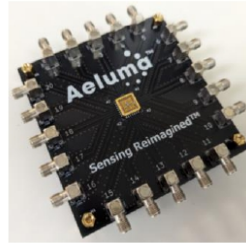
© Aeluma, Inc. All Rights Reserved. Note: Outcomes cannot be guaranteed. Metrics not based on actual data and are provided for qualitative illustration purposes only. Typical InP substrate sizes are 3- or 4-inch. Typical Si substrate sizes are 8- or 12-inch. APD: Avalanche photodiode. SPAD: Single-photon avalanche diode.

Custom Detector Arrays

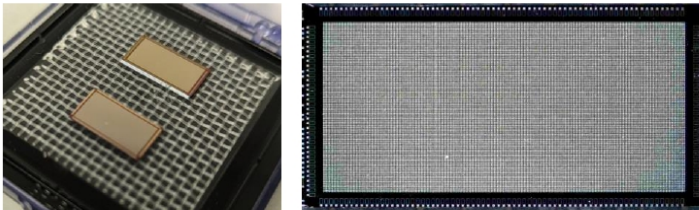
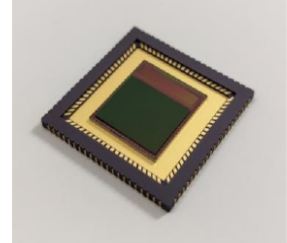
SWIR Detector Arrays for Active and Passive Imaging

- Low dark current photodetector arrays manufactured with large-diameter substrate platform
- Pixel and array size customizable
- Typical array sizes: 128 X 32, 256 X 128, 640 X 512
- Delivered as PDA chips or with ROICs
- FPA assembly available
- Small test arrays (ex. 8 X 8) available for evaluation/qualification

Evaluation Board



Focal Plane Array Assembly



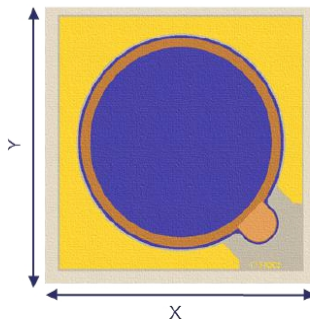
Examples shown are 256 X 128 arrays

Applicable markets include: automotive, mobile, AR/VR, defense & aerospace, industrial and logistics, and security

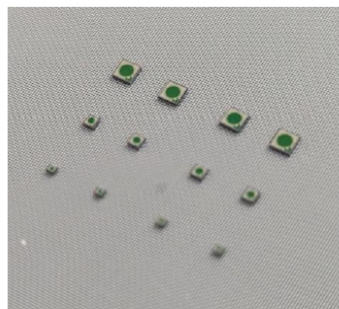
Large-Area Detectors

High sensitivity and low dark current and high speed detectors for SWIR and XSWIR

- Typical Photosensitive Diameter (D): 0.25 to 5.0mm
- Typical Operating Wavelength (λ): 0.95 to 1.55 μ m
- Device: PIN, APD or SPAD
- Format: Bare die or mounted in TO package



Bare Die



TO Package



Applicable markets include: automotive, mobile, AR/VR, defense & aerospace, industrial and logistics, gas sensing, instrumentation, and security

Opportunities for Growth

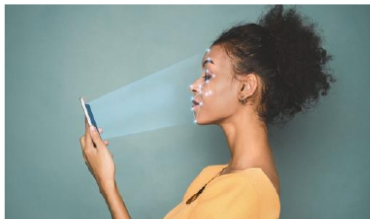
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Mobile and Consumer Markets

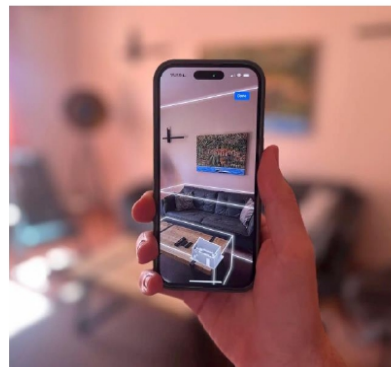
Representing ~\$296B in Semiconductor Revenue in 2023*



Facial ID



LiDAR Scanner



Proximity Sensor



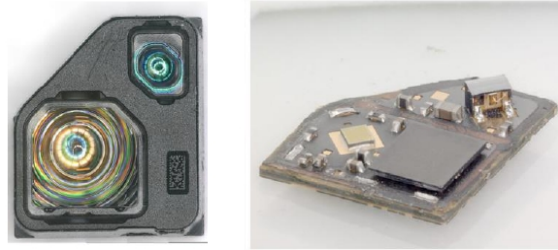
Proximity Sensors in Mobile Devices with Displays

Under the Screen Sensors

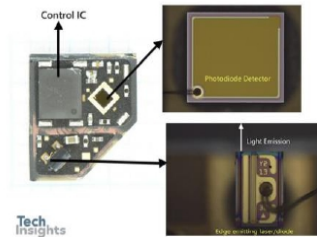
Behind the screen sensors minimize cutout but may distort screen



Under Display Proximity Sensor in iPhone 14 Pro: Enabled by SWIR Laser/Detector Pair



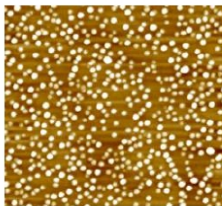
<https://www.yolegroup.com/product/report/iphone-14-pro-under-display-proximity-sensor/>



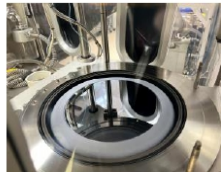
Quantum Dot Lasers

Heterogeneous Integration by Selective Growth

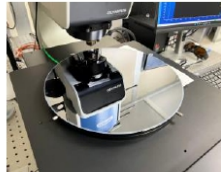
Quantum Dot Lasers



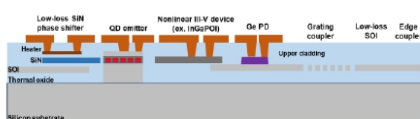
12-inch Wafer in Growth Chamber



12-inch Wafer Under Test

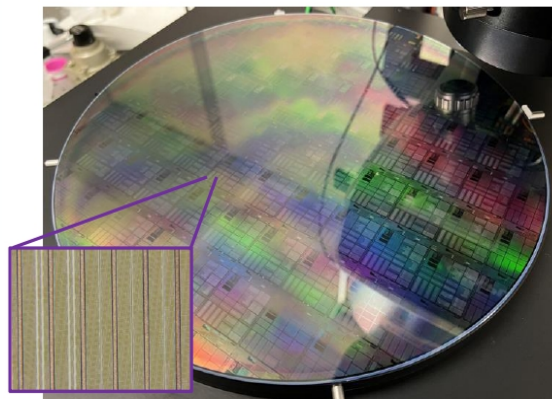


Lasers for Silicon Photonics



Integration of quantum dot lasers and other group III-V active devices in Silicon Photonics

12-inch Silicon Photonics Wafer with Aeluma Materials



Aeluma™ AIM PHOTONICS

[Aeluma, Inc. Enters into Agreement with RFSUNY to Support AIM Photonics](#)

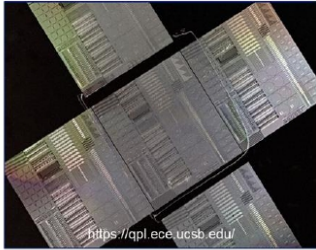
Applicable markets include: AI, high-performance computing, automotive, mobile, AR/VR, defense & aerospace, quantum computing, and communication

Quantum Computing with Photonics

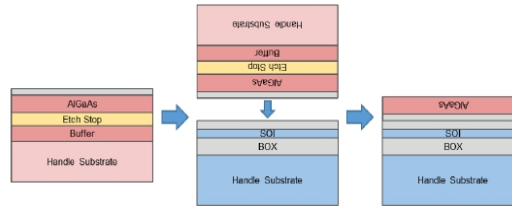


Entangled Photonic Pair Generation Enabled Heterogeneous Integration

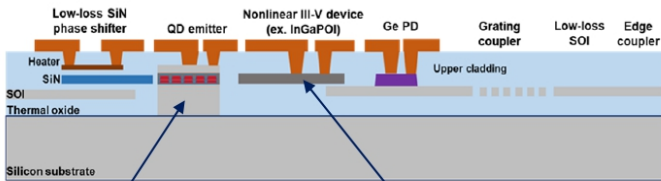
Quantum Photonic Circuits



Adding III-V layer to SOI Silicon Photonics Platform



Nonlinear III-V devices in 300mm SOI Silicon Photonics



Integrated gain with selective growth of InAs quantum dots

Integrated source with nonlinear InGaP or AlGaAs

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Demonstration on 100mm substrated using Aeluma's 300mm growth capability



AlGaAs-on-Insulator following hybrid wafer bonding and substrate removal

19

CHIPS Act Microelectronics Commons



Aeluma Hub Leader USC Named Recipient of CHIPS Act Program Award

RELEASE
IMMEDIATE RELEASE

Deputy Secretary of Defense Kathleen Hicks Announces \$238M CHIPS and Science Act Award

Sept. 20, 2023 | [f](#) [t](#) [r](#)

Deputy Secretary of Defense Kathleen Hicks announced the award today of \$238 million in "Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act" funding for the establishment of eight Microelectronics Commons (Commons) regional innovation hubs.

This is the largest award to date under President Biden's CHIPS and Science Act.

"The Microelectronics Commons is focused on bridging and accelerating the lab-to-fab transition, that infamous valley of death between R&D and production," said Deputy Secretary Hicks. "President Biden's CHIPS Act will supercharge America's ability to prototype, manufacture, and produce microelectronics scale. CHIPS and Science made clear to America — and the world — that the U.S. government is committed to ensuring that our industrial and scientific powerhouses can deliver what we need to secure our future in this era of strategic competition."

Source: <https://www.defense.gov>

- Deputy Secretary of Defense announced \$238 million in CHIPS funding for the establishment of Microelectronics Commons regional hubs
- According to the announcement, only 8 of 83 submitted proposals were selected for a funding award
- Aeluma hub leader University of Southern California led winning proposal
- Aeluma proud to have contributed to winning proposal and participating as affiliate member of the hub

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20

Future Advanced-Node Semiconductors

Heterogeneous Integration of III-V Materials on Silicon CMOS



Aeluma Wins \$11.717 Million DARPA Contract for Nano-Scale Semiconductors

SEPTEMBER 18, 2024 4:01PM EDT

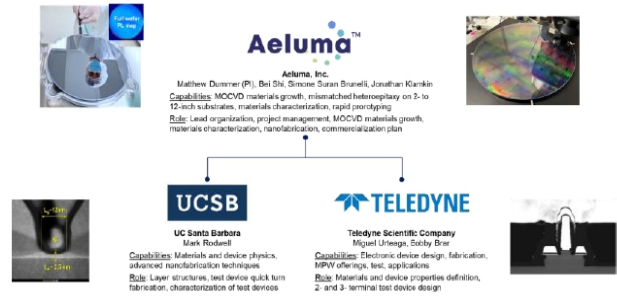
[Download as PDF](#)

Award to Develop Heterogeneous Integration Technology Compatible with Leading Edge and Future Advanced-Node Semiconductors

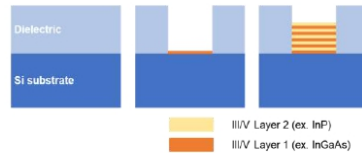
Technology Applications Include AI, Mobile Devices and 5G/6G

Aeluma Partnering with Teledyne Scientific Company and University of California Santa Barbara

GOLETA, CA / ACCESSWIRE / September 18, 2024 / Aeluma, Inc. (OTCQB:ALMU), a semiconductor company specializing in high performance, scalable technologies for mobile, automotive, AI, defense & aerospace, communication and quantum computing, announced today that it has been awarded funding from the Defense Advanced Research Projects Agency (DARPA) to develop heterogeneous integration technology compatible with leading edge and future advanced-node semiconductors with potential applications in AI, mobile devices and 5G/6G wireless communication.

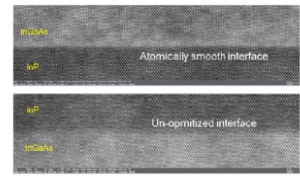


NEOFILMS Selective Area Heteroepitaxy Concept



SAH provides aspect ratio trapping and thermal stress relief while enabling CMOS process integration.

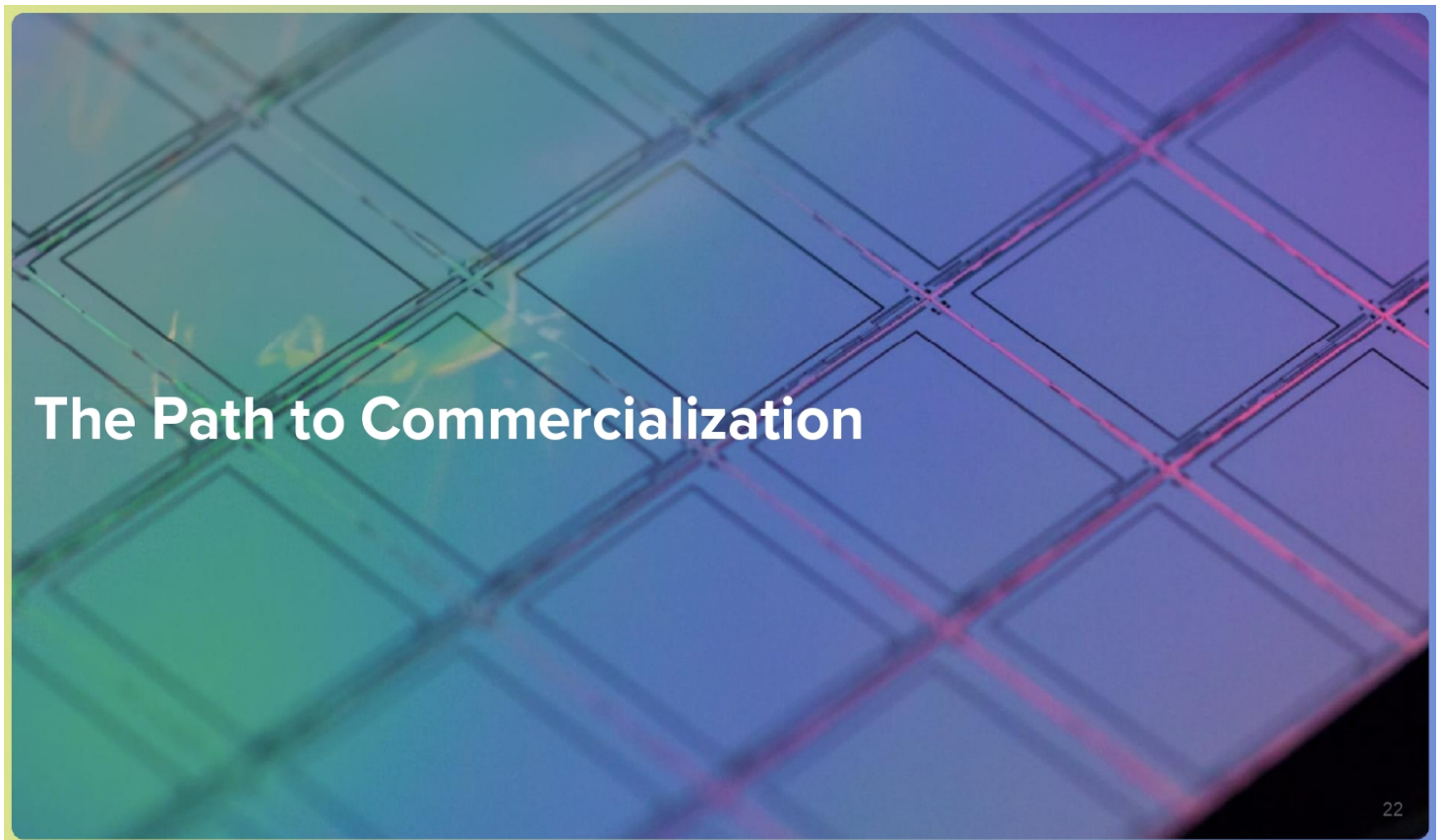
Atomic Layer Epitaxy for Composition Sharpness



MOCVD-enabled ALE allows for atomic-level control of film thickness and interface sharpness.

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21



The Path to Commercialization

22

Aeluma's Headquarters

Ideal Location for Development and Commercialization



- Located in Goleta, California High-Tech Corridor
- 9,000 sq. ft. space with cleanroom facility
- ISO 9001:2015 Certified



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23

Aeluma's Cost-Effective Scalable Manufacturing

12-inch Wafer Capability and Strong Intellectual Property



- Commercial 12-inch state-of-the-art deposition tool
- Set up for cassette loading production
- Support equipment for wafer clean and processing
- Extensive patent protection and trade secrets
- **Large-volume foundry partners for scaling**



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24

Leadership Team



Vision, Entrepreneurship and Expertise

Senior Management



Jonathan Klamkin, PhD
 Founder, CEO &
 Director



Matthew Dummer
 Director of Technology



Board Members



Steven DenBaars, PhD
 Advisor, Seed Investor &
 Director



John Paglia, PhD
 Director



Craig Ensley
 Director



Investors/Advisors



Shuji Nakamura, PhD
 Seed Investor

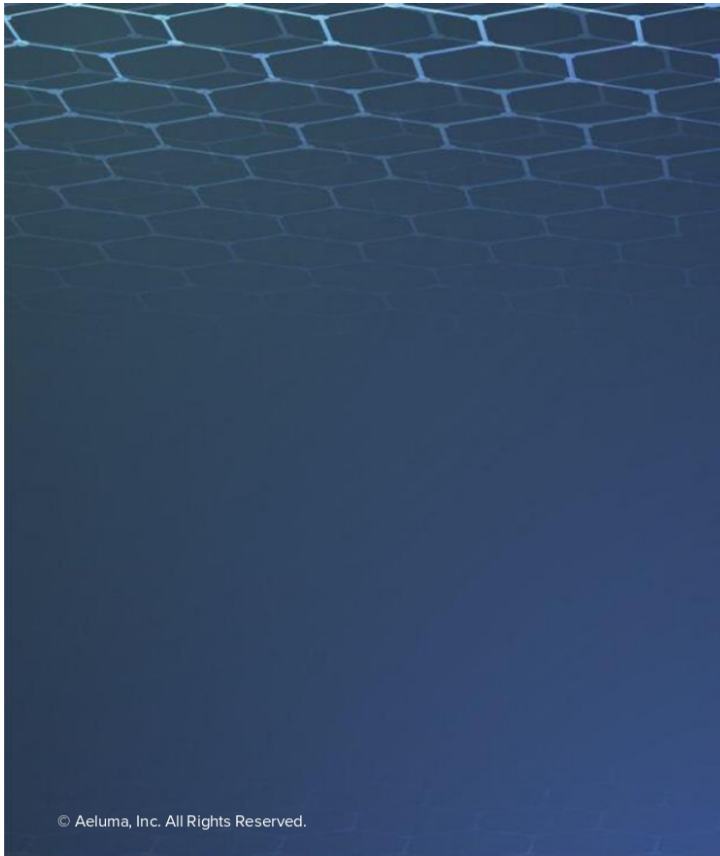


Richard Ogawa, JD
 Advisor & Seed Investor



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25



Sensing Reimagined™

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26