Aeluma™

Sensing Reimagined™

Investor Presentation

October 2023

Forward Looking Statements

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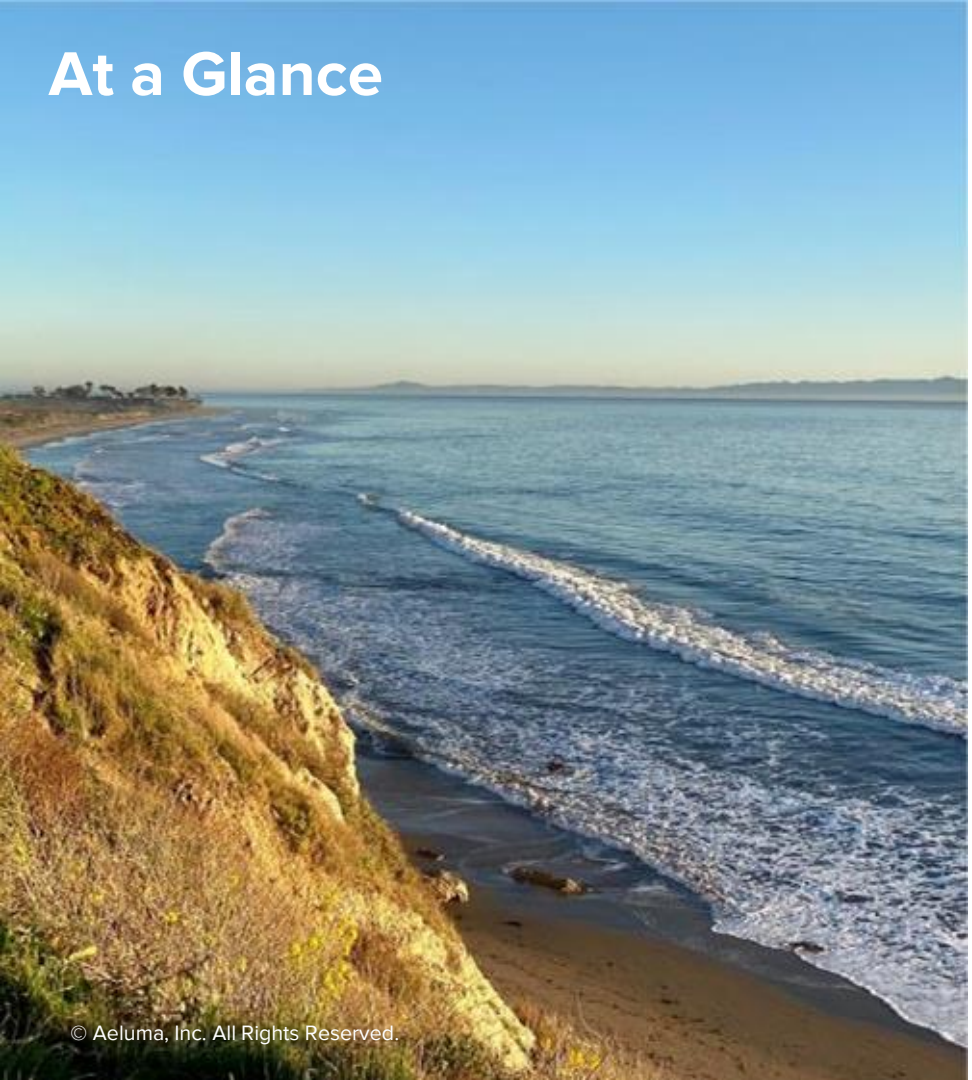
At a Glance



Aeluma, Inc. (OTCQB: ALMU)

Goleta, California

Tranformative semiconductor chip company
High performance combined with scalability

Markets: Automotive LiDAR, Mobile, AR/VR, Communication, Defense & Aerospace, AI

Team: ~15 people

IP: ~23 issued and pending patents, trade secrets

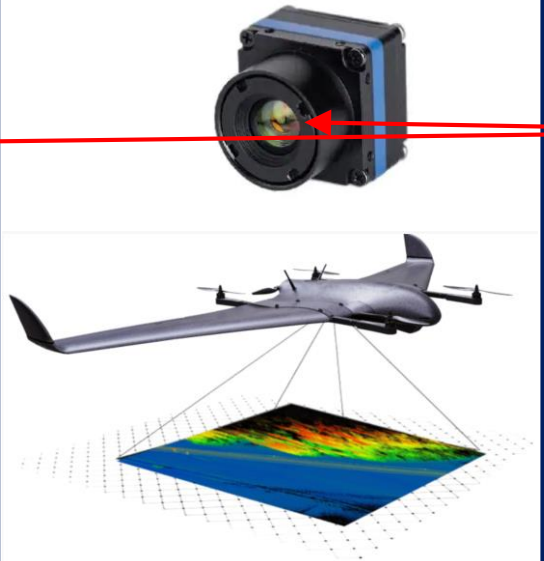
Traction: Engineering sample deliveries, contracts, multiple customers, revenue

Background on Automotive LiDAR

High-Performance Semiconductor Sensors for Autonomous Systems

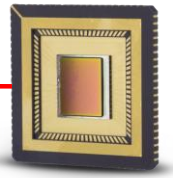
Automotive LiDAR

Infrared Imaging



Behind the "Eye"

Representative commercial InGaAs-on-InP FPA for 3D imaging and **long-range LiDAR**



Issues preventing broad adoption

- Scale: Existing suppliers unable to scale
- Cost: Price for detector array is too high

Aeluma's technology seeks to address these challenges with scalable, cost-effective manufacturing based on physics breakthroughs and cutting-edge intellectual property.

Performance that scales

LiDAR: Light detection and ranging; InGaAs: Indium Gallium Arsenide; InP: Indium Phosphide; FPA: Focal plane array. Note: Outcomes cannot be guaranteed.
Sources of images: https://www.flir.com/support/products/swir-ingaas-fpa/; https://www.bhphotovideo.com; https://www.wardsauto.com/vehicles/lidar-house-battery-production-volvo-s-sights; https://ouster.com/blog/mhttps://www.foresightauto.com/thermal-cameras-solve-autonomous-trucks-dust-problem/ake-intersections-safer-trb/; https://www.deltaquad.com/vtol-drones/inspect/; www.digikey.com

The Aeluma Approach to Sensor Manufacturing

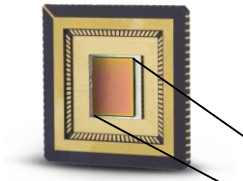
High-Performance Technology with Large-Diameter Substrate Manufacturing

Aeluma™

Aeluma™

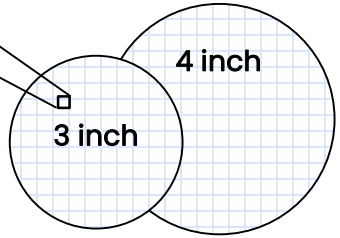
Leaping from InP to Silicon

Representative commercial InGaAs-on-InP sensor for 3D imaging and **long-range LiDAR**

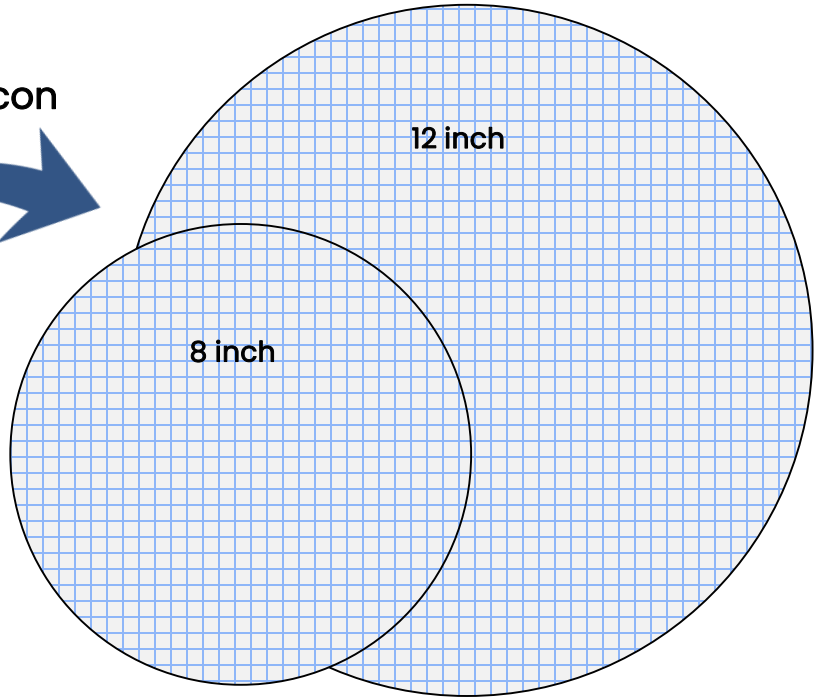


Manufactured on InP substrates

InP substrate sizes



Silicon substrate sizes



InGaAs: Indium Gallium Arsenide; InP: Indium Phosphide; LiDAR: Light detection and ranging; FPA: Focal plane array
Source of image: https://www.flir.com/support/products/swir-ingaas-fpa/; Note: Outcomes cannot be guaranteed.

Aeluma's Technology Breakthrough

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

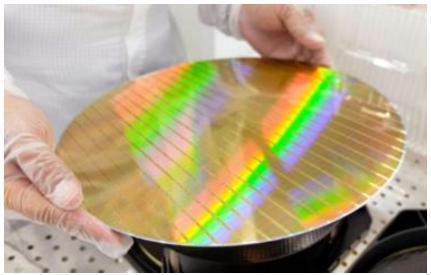
Conventional manufacturing of InGaAs photodetector arrays

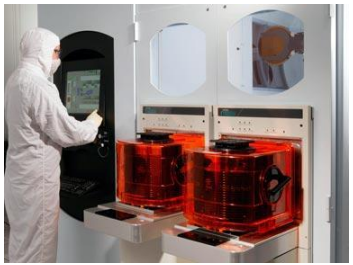
Non-scalable, manual and low throughput

16X wafer area

Moving from 3-inch to 12-inch wafers

Aeluma high-performance InGaAs photodetector arrays with Silicon manufacturing





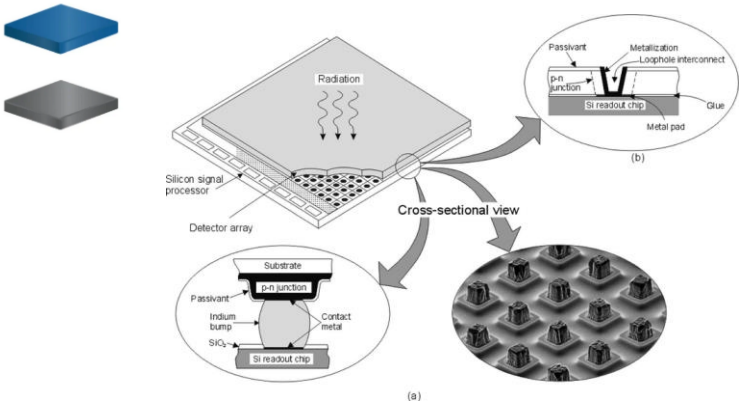
- ✓ Highly automated and ability to produce many arrays per wafer
- ✓ 10X lower manufacturing cost for mass market applications

Note: Outcomes cannot be guaranteed.

Wafer-Scale Integration and 3D Packaging

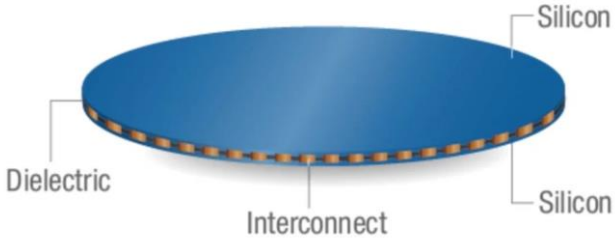
Silicon Manufacturing Environment Enables Advanced Integration and Packaging

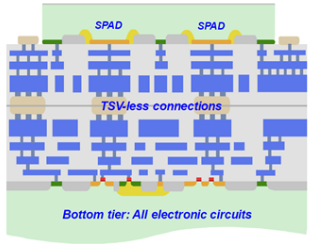
Conventional chip-to-chip hybridization



- Expensive packaging with low throughput
- Limited performance indium bumps
- Pixel sizes limited to ~5 μm (>10 μm typical)

Wafer-to-wafer 3D Integration





- ✓ **Low cost and high throughput**
- ✓ **Higher performance with low capacitance copper interconnect**
- ✓ **Small pixels (<1 μm possible)**
- ✓ **3D stacking of multiple CMOS layers**

Sources of images: A. Rogalski, Optical Engineering, 42(12), 2003; https://www.allaboutcircuits.com/news/moores-law-xperi-new-die-to-wafer-bonding-technology-ic-package/; E. Charbon, et al., ICECS, 2018; CMOS: complementary metal-oxide semiconductor

Aiming to Service a Broad Market

High-Performance Semiconductors for Sensing and Communications

Automotive LiDAR

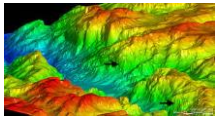


- Consumer vehicles
- Robotaxis
- Trucking

Industrial and Logistics


- Robotics
- Delivery robots
- Factory automation
- Logistics
- Security

Defense & Aerospace

- Imaging and LiDAR
- Security
- Autonomous systems
- Atmospheric sensing
- Topography

Mobile and AR/VR



- Mobile phone, tablet
- Face ID
- LiDAR scanner
- Proximity sensors
- AR/VR glasses

Communications, Quantum and AI


- Telecommunications
- Data centers
- Quantum computing
- 5G/6G
- AI communications

Aggregate of these Markets is $Trillions

Market sizes based on internal studies and projections for 2030.

Aiming to Service a Broad Market

High-Performance Semiconductors for Sensing and Communications

Automotive LiDAR

- Consumer vehicles
- Robotaxis
- Trucking

2024 Market Projections[1]

113 million automotive vehicles

131 million tablets

1.73 billion mobile phones

2030 TAM for Automotive LiDAR[2,3,4]

$5B-$80B

- Robotics
- Delivery robots
- Factory automation
- Logistics
- Security

- Imaging and LiDAR
- Security
- Autonomous systems
- Atmospheric sensing
- Topography

Mobile and AR/VR

- Mobile phone, tablet
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Communications, Quantum and AI

- Telecommunications
- Data centers
- Quantum computing
- 5G/6G
- AI communications

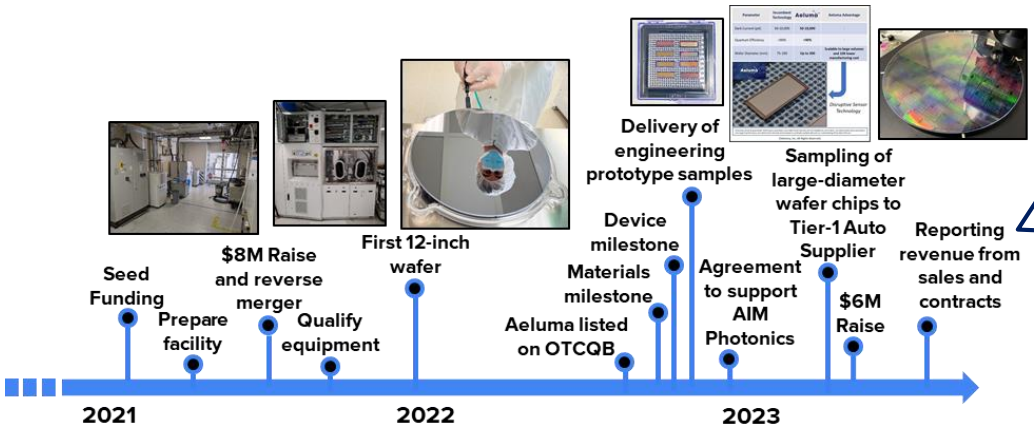
Aggregate of these Markets is $Trillions

1. www.idc.com; 2. https://www.bloomberg.com/press-releases/2022-05-31/lidar-market-size-to-be-worth-4-71-billion-by-2030-grand-view-research-inc; 3. AEye Presentation, LD Micro Invitational 2022; 4. Velodyne estimate; Note: Past results are not indicative of future results; outcomes cannot be guaranteed.

NEWS: First Ever Revenue Reported

Aeluma's Annual Report on Form 10-K Reports Revenue from Multiple Customers

Aeluma's Timeline



Aeluma has met or beat all of its milestones

Revenue Reported

- Aeluma recognized revenue of ~$193K from its products in fourth fiscal quarter ended June 30, 2023 (see 10-K filed on September 25, 2023)
- Revenue generated primarily from small-volume orders and development projects
- Company receiving payments from three customers and has several pending contracts

Achieving revenue after only little more than 2 years from our initial private placement financing

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

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 |

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.

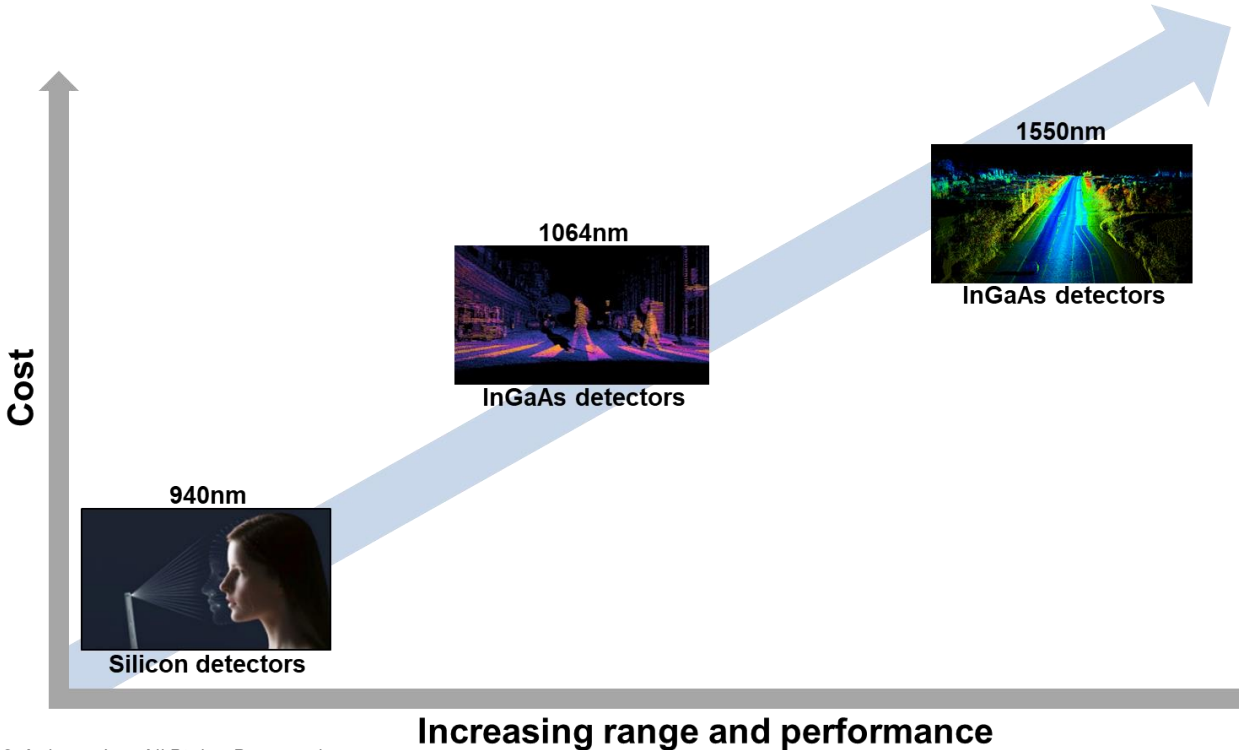
"The Microelectronics Commons is focused on bridging and accelerating the lab-to-fab transition, that infamous valley of death between R&D and production," said Deputy Secretary Hicks. "President Biden's CHIPS Act will supercharge America's ability to prototype, manufacture, and produce microelectronics 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 looks forward to participating as affiliate member of the hub

Aeluma's Initial Focus on Automotive LiDAR

- LiDAR is essential for Autonomous Driving (AD) and Advanced Driver Assistance Systems (ADAS).[1]
- Mid- and long-range LiDAR sensors require InGaAs-based receivers[2], however, InGaAs manufacturing is expensive and low volume therefore preventing scaling and broad adoption.[3]



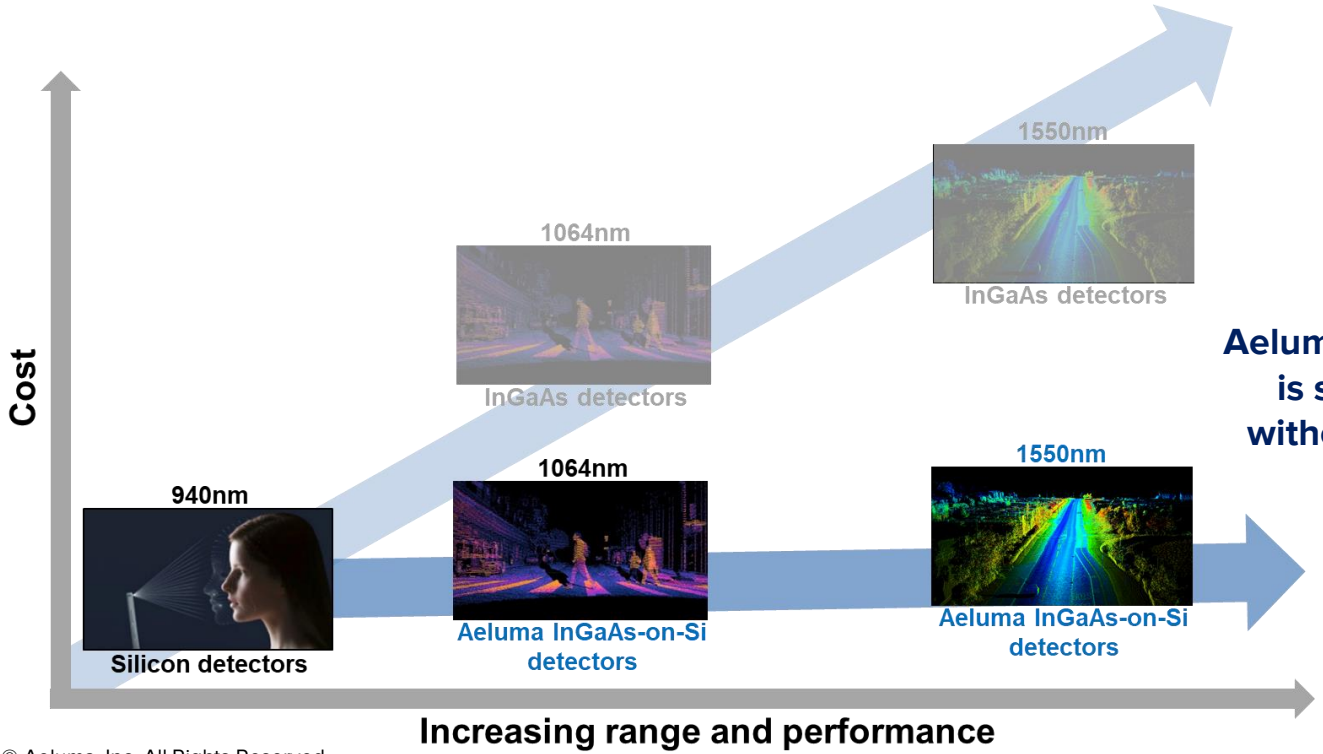
Note: Past results are not indicative of future results. Outcomes cannot be guaranteed. Range and cost estimates not based on actual data. Sources of images: blog.laserto.com; novuslight.com; techcrunch.com; i-microwaves.com

1. https://www.iihs.org/news/detail/pedestrian-crash-avoidance-systems-cut-crashes--but-not-in-the-dark
2. C. Rablau, "LIDAR – A new (self-driving) vehicle for introducing optics to..." ETOP 2019, paper 11143_138.
3. https://www.mdpi.com/2076-3417/9/19/4093

Aeluma's Goal:

To Provide Increased Visibility and Longer Range Cost Effectively

Manufacturing high-performance InGaAs photodetector arrays at Silicon cost levels



Aeluma's disruptive InGaAs-on-Si is scalable and cost-effective without sacrificing performance.

Note: Past results are not indicative of future results. Outcomes cannot be guaranteed. Range and cost estimates not based on actual data. Sources of images: blog.laserto.com; novuslight.com; techcrunch.com; i-microwaves.com

Si: Silicon

Emerging Market:
Automotive OEM LiDAR Demand is Increasing

Mercedes Taps Luminar for Laser Sensors, Takes Stake in the Company

- Technology company also has production pacts with Volvo, SAIC
- European automakers 'ahead of the game' on lidar, CEO says

By Gabrielle Coppola
January 20, 2022, 6:00 AM PST *Updated on January 20, 2022, 9:41 AM PST*
From **Hyperdrive**

Volvo Will Install Lidar on All New Vehicles

Recently it was announced that Volvo will install LiDAR systems onto all new vehicles to help identify potential dangers at extreme distances.

Source and Image: LiDAR News, October 12, 2022
https://blog.lidarnews.com/volvo-will-install-lidar-on-all-new-vehicles/

Note: Past results are not indicative of future results. Outcomes cannot be guaranteed.

Emerging Market:

Automotive OEM LiDAR Demand is Increasing

TRANSPO / MERCEDES-BENZ / CARS

Mercedes-Benz will add Luminar lidar to ‘a broad range’ of vehicles by mid-decade

Image: Mercedes-Benz AG

/ The two companies are expanding their partnership to include a lot more vehicles sporting the laser sensor that has quickly become an essential ingredient in autonomous driving.

By Andrew J. Hawkins, transportation editor with 10+ years of experience who covers EVs, public transportation, and aviation. His work has appeared in The New York Daily News and City & State.

Feb 22, 2023, 10:30 AM PST | 0 Comments / 0 New

Source: https://www.theverge.com

Note: Past results are not indicative of future results. Outcomes cannot be guaranteed.

Emerging Market:
Automotive OEM LiDAR Demand is Increasing

Toyota's LS 500h and Mirai models with short and long-range LiDAR
Image Credit: Toyota

https://www.motor1.com/news/499716/lexus-toyota-advanced-drive-system/

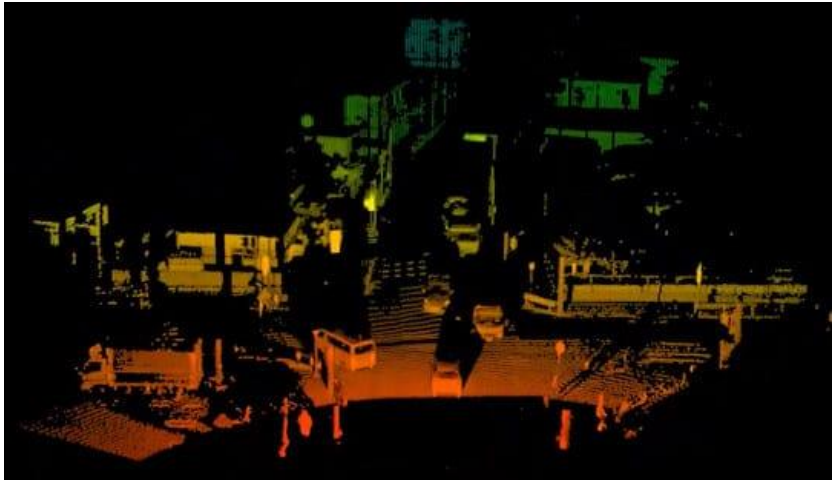


Image Credit: MIRISE (DENSO / Toyota)

Note: Past results are not indicative of future results. Outcomes cannot be guaranteed.

Emerging Market:

Automotive OEM LiDAR Demand is Increasing

Nissan Motor Corporation: “Nissan aims to expand ProPILOT technology to over 2.5 million Nissan and INFINITI vehicles by fiscal year 2026. The company will also further develop its autonomous vehicle technologies, aiming to incorporate next generation LIDAR systems on virtually every new model by fiscal year 2030.”

https://usa.nissannews.com/en-US/releases/nissan-unveils-ambition-2030-vision-to-empower-mobility-and-beyond

Note: Past results are not indicative of future results. Outcomes cannot be guaranteed.

Emerging Market:
Automotive OEM LiDAR Demand is Increasing

Source: TESLARATI Aug 3, 2022

Israeli lidar startup Innoviz struck a deal reported to be worth $4 billion with Volkswagen to supply advanced ADAS (advanced driver-assistance system) features for its next generation of automated vehicles. The deal will run for eight years starting "mid-decade", when the first Innoviz-equipped Volkswagen group vehicles are expected to ship. Innoviz expects to supply units for between 5 million and 8 million Volkswagen Group vehicles in total.

Source: NoCamels Aug 3, 2022

Note: Past results are not indicative of future results. Outcomes cannot be guaranteed.

Emerging Market:

Automotive OEM LiDAR Demand is Increasing

Volkswagen's autonomous ID.Buzz EVs to begin transporting passengers in Germany

Scooter Doll | Jul 14 2023 - 6:26 am PT | 12 Comments

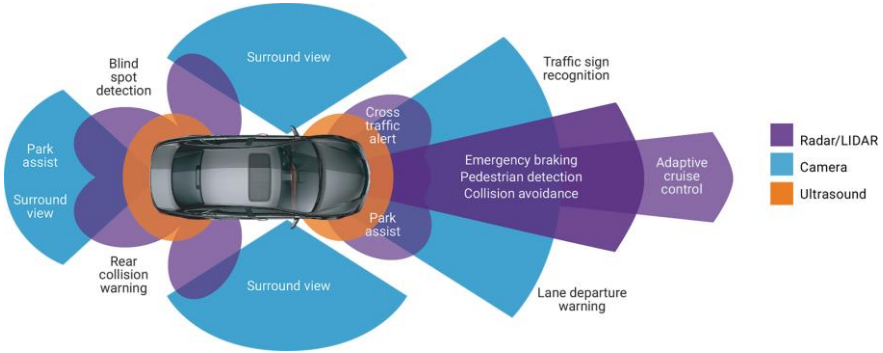
Source: https://electrek.co

Note: Past results are not indicative of future results. Outcomes cannot be guaranteed.

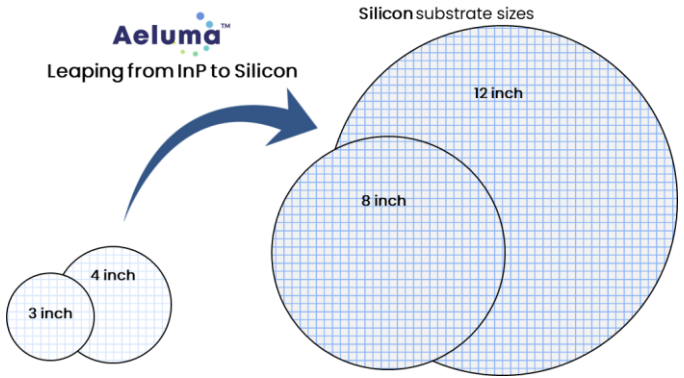
Manufacturing for a Mass Market

Aeluma's Large-Diameter Manufacturing Economies of Scale

Cars will have Radar, LiDAR, and Camera sensors



- **Market: 113 million automotive vehicles in 2024[1]**
- **Each vehicle may have 1-5 LiDAR sensors**
- **Note: Some LiDARs require more than 1 FPA**



Example case: Manufacturing 5,000,000 FPA units

Number of wafers required
3-inch: 106,383 wafers
4-inch: 53,192

3-inch: 47 chips per wafer
4-inch: 94 chips per wafer

Number of wafers required
8-inch: 10,706 wafers
12-inch: 4,425

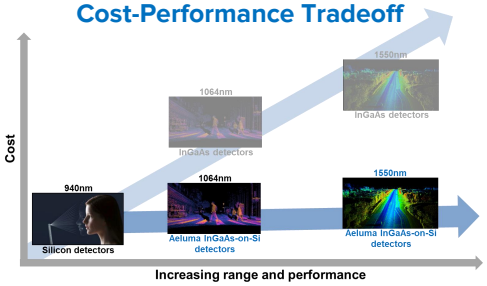
8-inch: 467 chips per wafer
12-inch: 1,130 chips per wafer

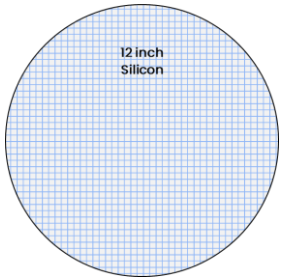
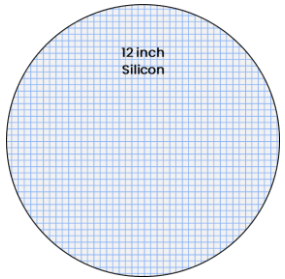
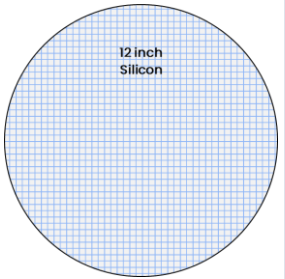
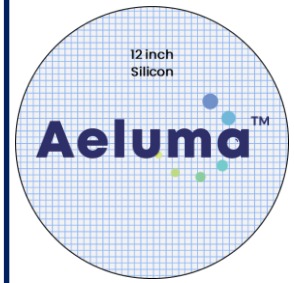
Aeluma's manufacturing approach can enable the scaling and cost reduction required for mass market applications.

Note: Outcomes cannot be guaranteed. Values are provided for qualitative illustration purposes only. [1]www.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 under consideration for scaling and cost reduction		
					
Technology:	Silicon SPAD	InGaAs-on-InP	Ge-on-Si	Thin film	**InGaAs-on-Si**
Status:	Incumbent for **short-range**	Incumbent for **long-range**	Considered for **long-range**	Considered for **long-range**	Considered for **long-range**
Performance:	Good	Best	Okay	Okay	**Best**
Multiplication (ex. APD, SPAD):	Yes	Yes	Maybe	No	**Yes**
Wafer-scale integration:	Yes	No	Yes	Yes	**Yes**

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.

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.

Aeluma's Headquarters

Ideal Location for Development and Commercialization

- Located in Goleta, California High-Tech Corridor
- In the heart of the Infrared Capital of the World
- 9,000 sq. ft. space with cleanroom facility
- Close to University of California Santa Barbara

Aeluma's Cost-Effective Scalable Manufacturing

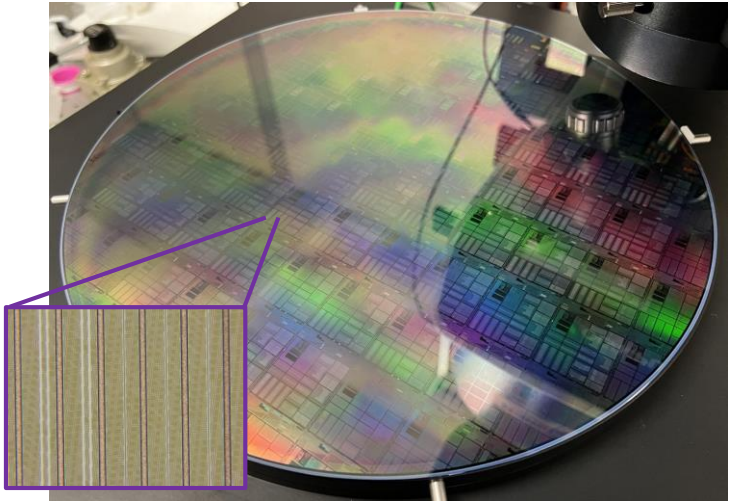
Unique 12-inch Wafer Capability and Strong Intellectual Property

- Commercial 12-inch state-of-the-art deposition tool
- Set up for cassette loading production
- One of only a few such tools worldwide
- Extensive patent protection and trade secrets

Silicon Photonics and Laser Integration

Aeluma's Technology Can Enable Process Integration

12-inch Silicon Photonics Wafer with Aeluma Materials



Aeluma™ AIM PHOTONICS

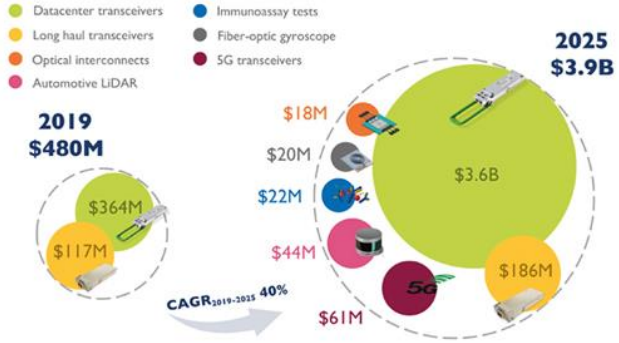
[Aeluma, Inc. Enters into Agreement with RFSUNY to Support AIM Photonics]

Silicon Photonics Applications

High-Performance Computing and Data Centers

AI and Photonic Computing

Summary of Applications and Market Data



Outcomes cannot be guaranteed. Source of market data: https://optics.org/news/11/5/12
Sources of images: https://venturebeat.com; https://spie.org/news/photonics-focus

Aeluma Intellectual Property Strategy

Key Aspects and Status

- Trade Secrets
  - Secret information that provides a competitive advantage
  - Reasonable precautions taken to preserve secrecy
  - Examples: confidential business information, process recipes, chip designs, layer structures, employees and skill levels
- Patents (~23 issued and pending patents)
  - Aim to cover nearly all aspects of technology including systems, applications, architectures, circuits, materials, packaging and assembly, process, device manufacturing, testing, structures
- Trademarks ("Aeluma™" and "Sensing reimagined™")
- Agreements including Non-Disclosure Agreements

Note: Outcomes cannot be guaranteed. Source of image: https://blog.ipleaders.in

Our Leadership Team

Vision, Entrepreneurship and Expertise

Jonathan Klamkin, PhD
Founder, CEO & Director

BINOPTICS · UCSB · MIT LINCOLN LABORATORY

Matthew Dummer
Director of Technology

Vixar · ams OSRAM

Steven DenBaars, PhD
Advisor, Seed Investor & Director

UCSB · SORAA · SLDLASER · AKOUSTIS

Richard Ogawa, JD
Advisor & Seed Investor

Inphi · amesite · AKOUSTIS · ODYSSEY SEMI

Shuji Nakamura, PhD
Seed Investor

UCSB · SLDLASER · SORAA

Jeffrey Shealy, PhD, MBA
Advisor & Seed Investor

AKOUSTIS · rfmd POWERED TO CONNECT · qorvo

Palvi Mehta
Director

PSL · RADIOFRAME NETWORKS · ExtraHop · newpath NETWORKS

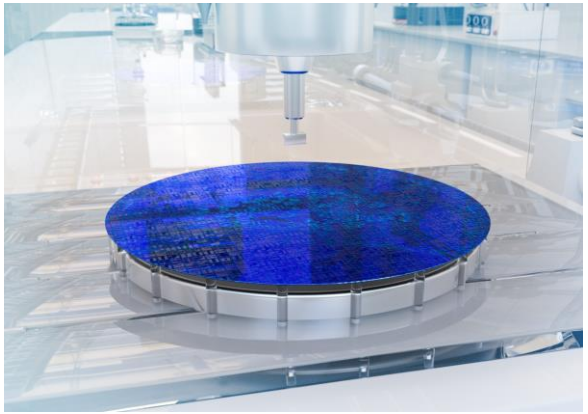
John Paglia, PhD
Director

PEPPERDINE GRAZIADIO BUSINESS SCHOOL · AXXES CAPITAL · SimulationsPlus

Aeluma Plans and Next Steps

Building on our Momentum

- Deliver on customer orders and contracts
- Government funding opportunities with industrial partners
- CHIPS Act opportunities
- Further establish production-scale foundry process and pursue strategic relationships
- Further business development opportunities
  - Continue to focus on automotive LiDAR
  - Broaden scope to include mobile, AR/VR, AI, industrial LiDAR, robotics, defense & aerospace, communications
- More inventions and patent protection
- Next generation products



Ready Aeluma for Mass-Market Scale

Note: Outcomes cannot be guaranteed.

Aeluma™

Sensing Reimagined™

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