



Sensing Reimagined™

Investor Presentation

December 12, 2022

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



Enabling the future of automation with high performance sensors

Overview

Aeluma is a leading-edge semiconductor company specializing in scalable, cost-effective sensor technologies for advanced LiDAR solutions.

Corporate Headquarters: Goleta, California (Infrared Capital of the World)

Founded: 2019

Employees: 11 (including five PhDs)

Highlights

Broad and defensible **intellectual property** portfolio

World-class technical **team**

Highly experienced **advisors** and seed investors including Nobel Laureate Shuji Nakamura

Went public through Form 10 Reverse Merger in June 2021 with \$8M oversubscribed raise – Listed on OTCQB (“ALMU”)



Mission



Our vision is:
Ubiquitous Sensing
Homes, cars, phones, ... everywhere



And we achieve this with:
Scale, Cost, and Delivery



Background on Automotive LiDAR

High-Performance Semiconductor Sensors for Autonomous Systems



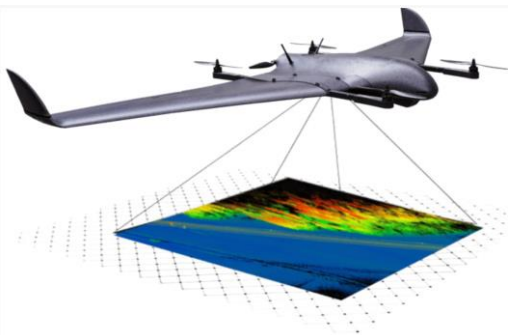
Automotive LiDAR



Reflected signal
← Outgoing laser beam

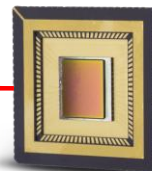


Infrared Imaging



What's Behind the "Eye"

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



Issues preventing broad adoption

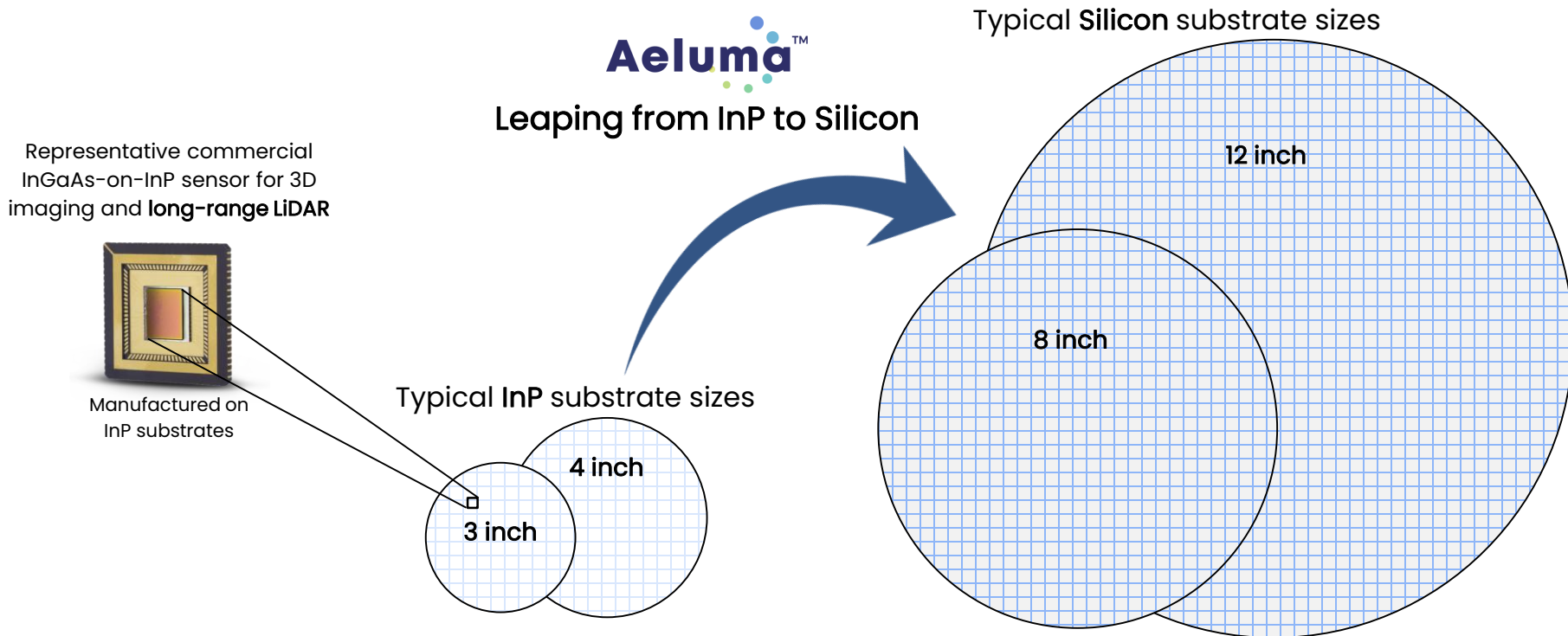
- **Cost:** Price for detector array is too high (receiver is ~30–40% total cost of the LiDAR)
- **Scale:** Existing FPA suppliers don't have clear path to scale to millions of units

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

High performance at low cost

The Aeluma Approach to Sensor Manufacturing

Bringing High-Performance Technology to Low-Cost Silicon Manufacturing



Aeluma's Technology Breakthrough

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



Conventional manufacturing of InGaAs photodetector arrays

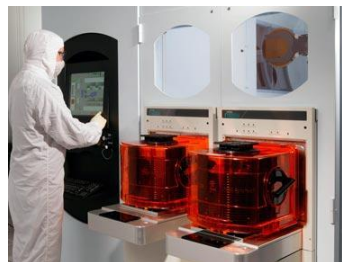
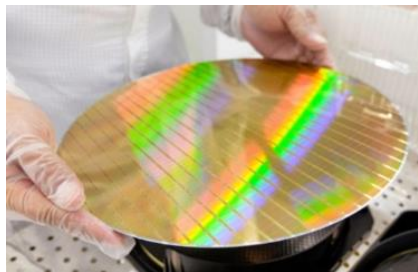


16X wafer area



Moving from 3-inch to 12-inch wafers

Aeluma high-performance InGaAs photodetector arrays with Silicon manufacturing



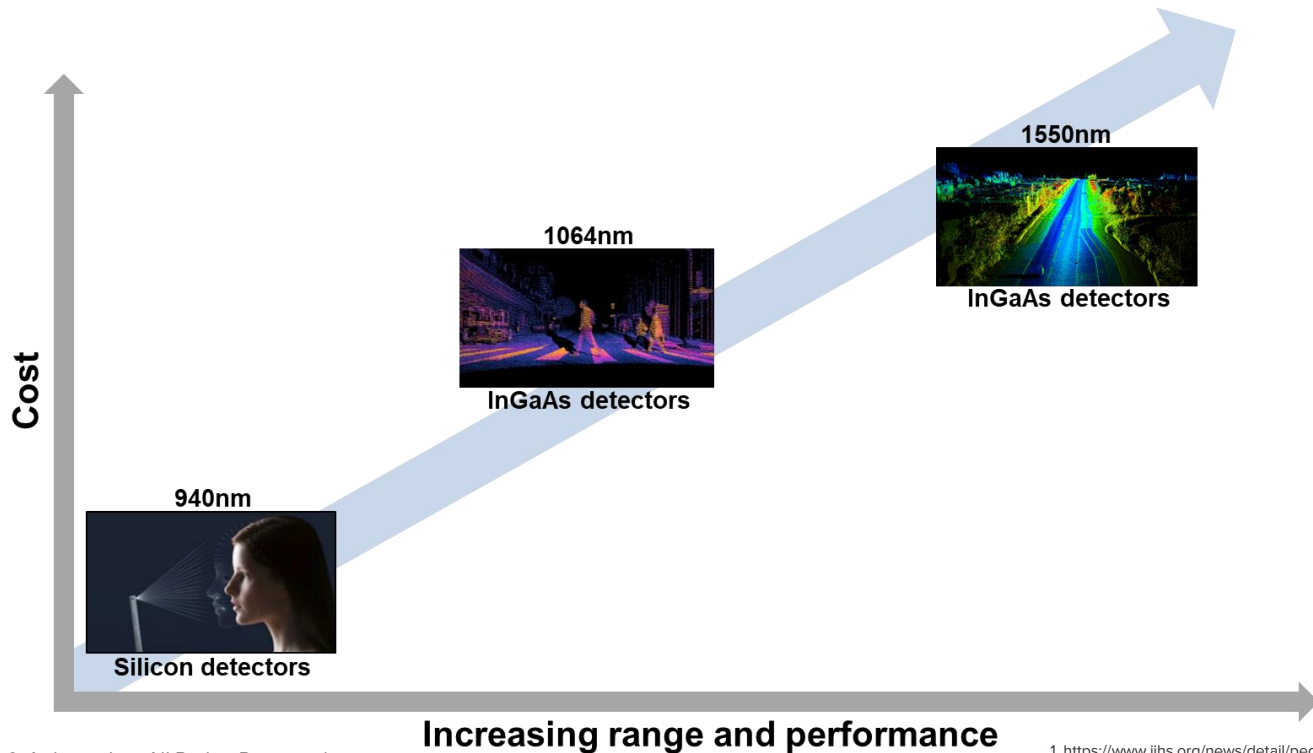
Non-scalable, manual and low throughput

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

Aeluma's Initial Focus on Automotive LiDAR



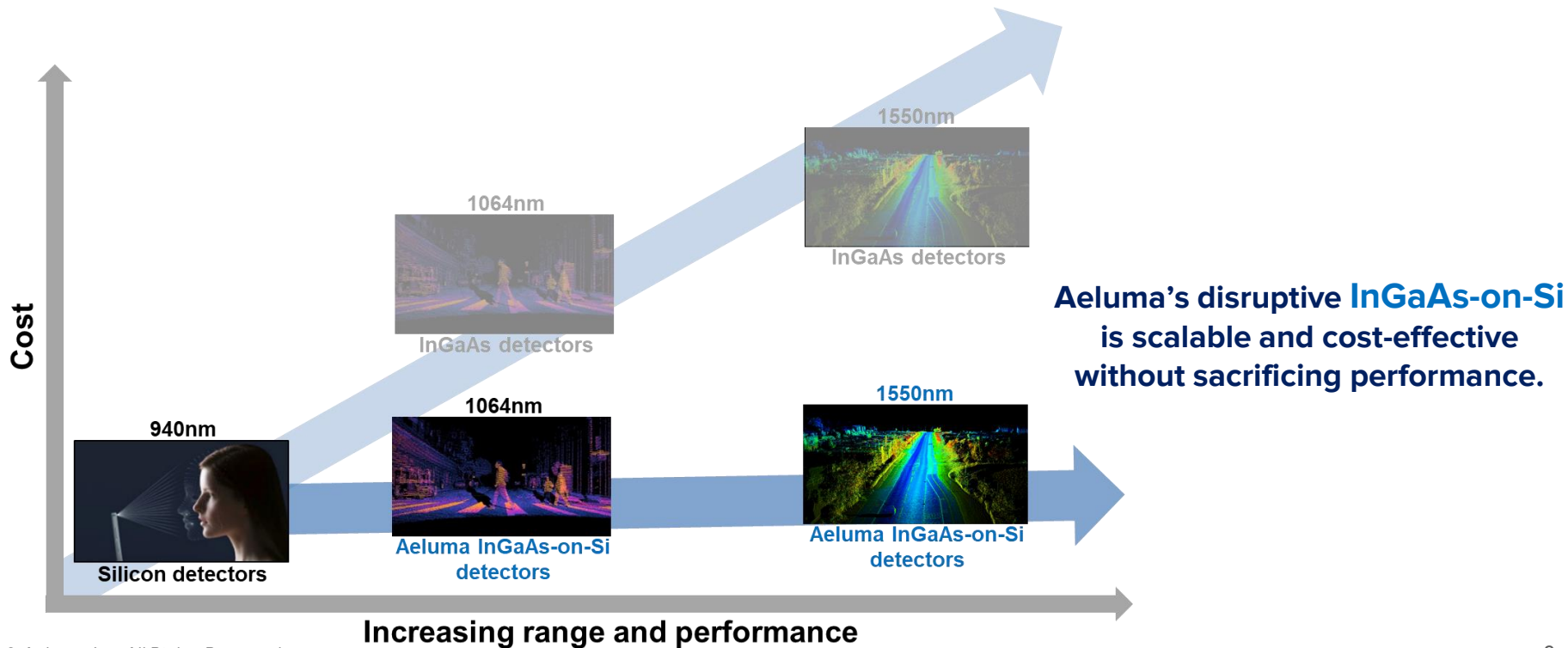
- LiDAR is essential for Autonomous Driving and Advanced Driver Assistance Systems (ADAS).¹
- Mid- and long-range LiDAR sensors require InGaAs-based receivers², however, InGaAs manufacturing is expensive and low volume therefore preventing scaling and broad adoption.³



Aeluma's Goal:

To Provide Increased Visibility and Longer Range Cost Effectively

Manufacturing high-performance InGaAs photodetector arrays at Silicon cost levels



Aiming to Service a Broad Market

High Performance Imaging for a Variety of Markets



Initial target markets



Autonomous Vehicles



Industrial
Automation and
Machine vision



Robots

Future potential markets



Mobile



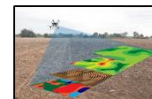
AR/VR



Thermal Imaging



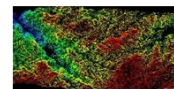
3D Imaging



Drone Mapping



Camera



Topography



Farming Automation

LiDAR for Automotive and Industrial 2030 TAM: \$5B-\$42B^{1,2}

2024 Market Projections³

113 million automotive vehicles

131 million tablets

1.73 billion mobile phones

Aeluma's technology can support this level of scale.

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/>



Emerging Market: Automotive OEM LiDAR Demand is Increasing



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

Image Credit: Toyota

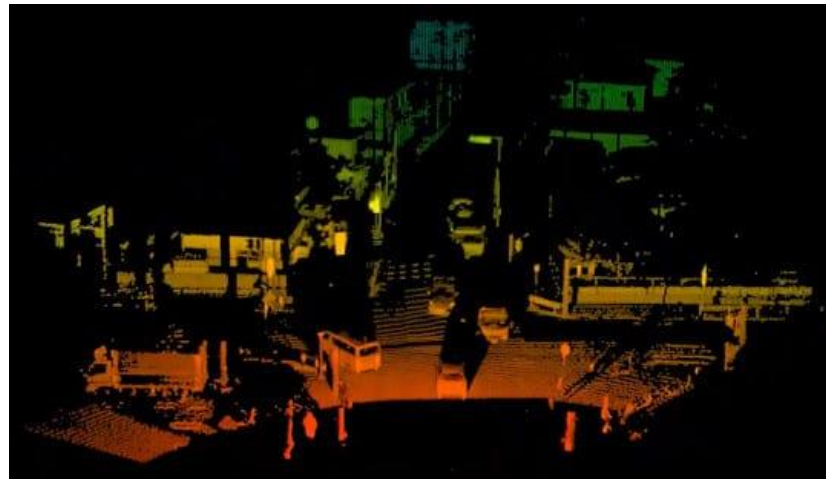


Image Credit: MIRISE (DENSO / Toyota)

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

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>

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.**

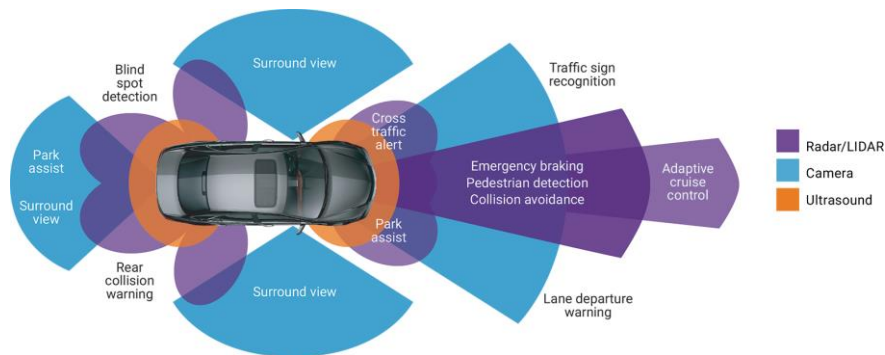
Source: NoCamels Aug 3, 2022

Manufacturing for a Mass Market

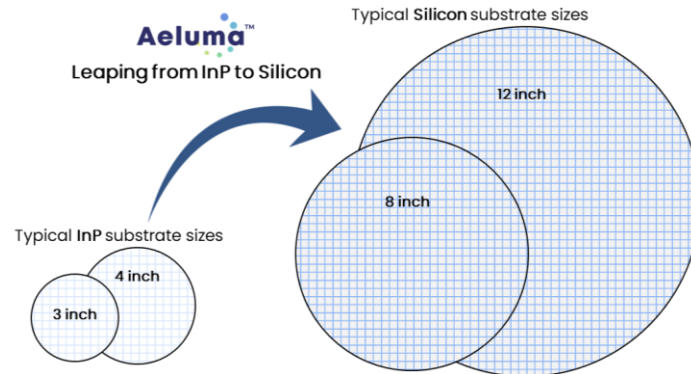


Aeluma's Large-Diameter Silicon Manufacturing Economies of Scale

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 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

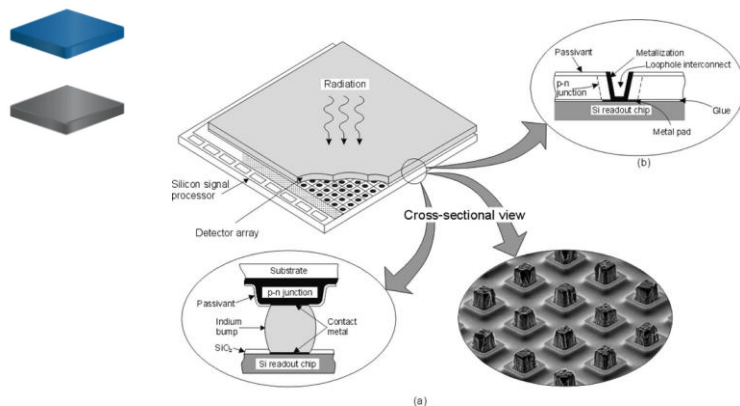
Aeluma's manufacturing approach can enable the scaling and cost reduction required for mass market applications.

Wafer-Scale Integration

Silicon Manufacturing Environment Enables Advanced Integration and Packaging

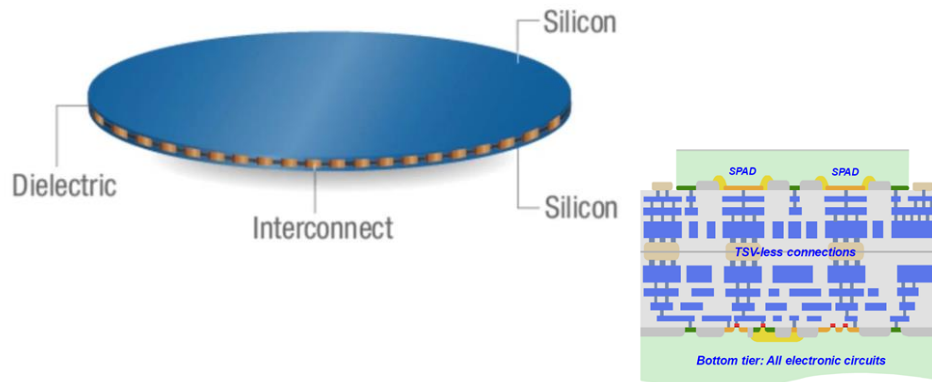


Conventional chip-to-chip hybridization



- Expensive packaging with low throughput
- Limited performance indium bumps
- Pixel sizes limited to $\sim 5 \mu\text{m}$ ($>10 \mu\text{m}$ typical)

Wafer-to-wafer 3D Integration



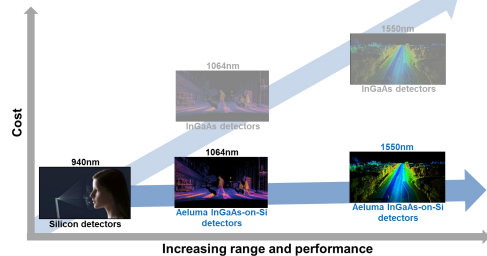
- ✓ **Low cost and high throughput**
- ✓ **Higher performance with low capacitance copper interconnect**
- ✓ **Small pixels ($<1 \mu\text{m}$ possible)**
- ✓ **3D stacking of multiple CMOS layers**

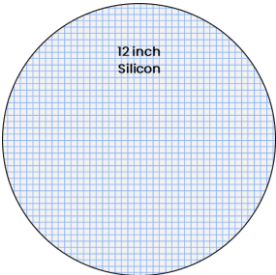
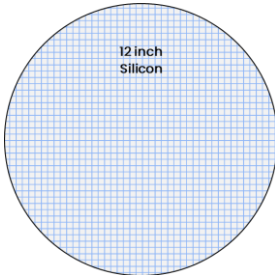
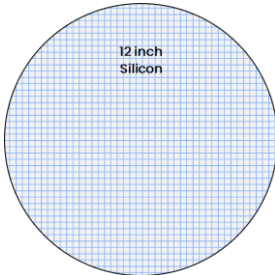
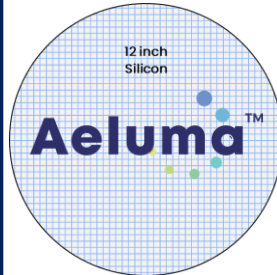
Aeluma Outperforms the Competition



Technology Comparison

Cost-Performance Tradeoff



	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	Very good	Okay	Okay	Very good
Multiplication (ex. APD, SPAD):	Yes	Yes	Maybe	No	Yes
Wafer-scale integration:	Yes	No	Yes	Yes	Yes

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

Aeluma's Headquarters

Facility with manufacturing cleanroom in ideal location for development

- 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



Timeline, Milestones and Traction



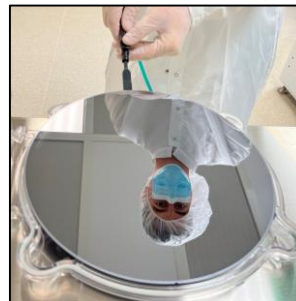
Aeluma's Go-to-Market Strategy: Partner with strategic system integrators, Tier 1 automotive suppliers, and semiconductor foundries to implement Aeluma's technology in LiDAR sensor products



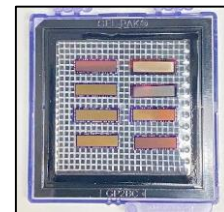
UCSB



transphorm



Continental



Concept and early-stage demonstration

Seed Funding

Prepare facility

APO

Install and qualify equipment

First 12-inch wafer

Prototype fabrication

Deliver engineering samples to customer (Tier 1 automotive supplier)

2019

2020

Q2-2021

Q3-2021

Q4-2021

Q1-2022

Q3-2022

Aeluma has beat all of its milestones and more...

Aeluma Milestone Achievements



Planned milestones

July 1, 2021 – December 31, 2022 (18 months)

1. Prepare facility
2. Install and qualify equipment
3. First run on 12-inch Silicon wafer
4. Wafers in R&D fab for development
5. First customer/contract wafers

How have we done?

Milestone Achievements Status

1. → Completed at Month 2
2. → Completed at Month 4
3. → Completed at Month 8
4. → Completed at Month 8
5. → Completed at Month 16

Notable achievements not planned for first 18 months

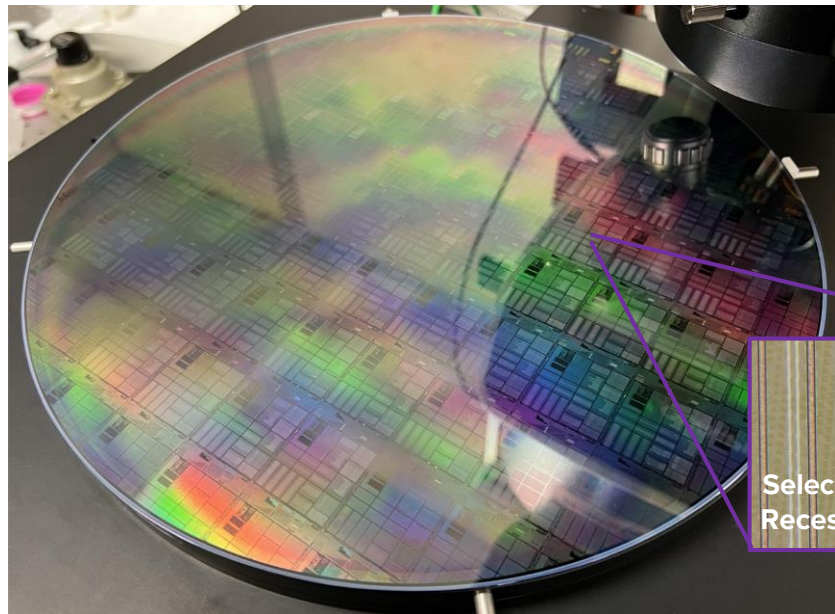
6. Prototype fabrication process developed
7. Delivered engineering samples to Tier 1 Automotive Supplier
8. Contract with RFSUNY – AIM Photonics
9. Patents: ~19 applications (including foreign filings)
10. Invited to join the Lidar Coalition
11. Developed preliminary foundry process
12. CEO interviewed on NBC to discuss Aeluma and the CHIPS Act
13. Invited to and participated in 3 investor conferences
14. Aeluma joins major Hub to respond to CHIPS Act program

Selective Growth for Laser Integration

Deposition of GaAs compounds in recesses for Silicon Photonics

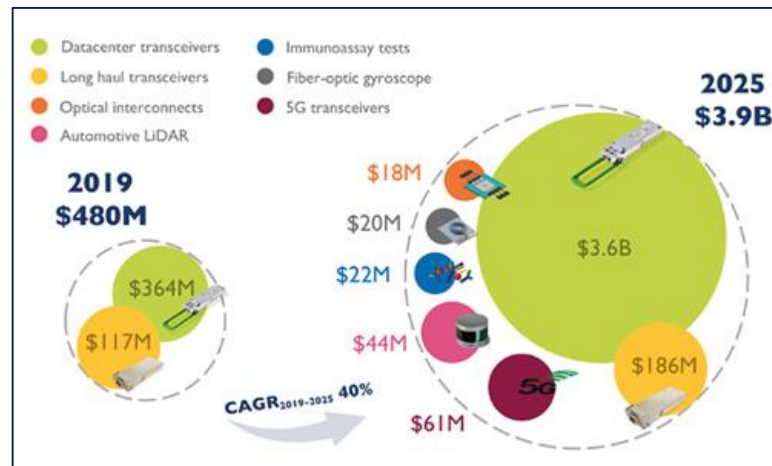


**12-inch AIM Photonics Silicon Photonics Wafer
with Selective Growth by Aeluma –
This can enable process integration!**



Selective Growth in
Recesses on Silicon

**Silicon Photonics Market Data – Applications
include Automotive LiDAR, Datacenters, 5G, etc.**



Aeluma Intellectual Property Strategy

Strategy 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 (~19 applications including country filings)
 - Aim to cover nearly all aspects of technology including systems, applications, architectures, circuits, materials, packaging and assembly, process, device manufacturing, testing, structures
- Trademarks (“AelumaTM” and “Sensing reimagedTM”)
- Agreements including Non-Disclosure Agreements

Our Leadership Team

Vision, Entrepreneurship and Expertise



Jonathan Klamkin, PhD

Founder, CEO &
Director

BINOPTICS



Shuji Nakamura, PhD

Seed Investor



UCSB

SLDLASER

SORAA



Thomas Laux

VP of Business
Development



Jeffrey Shealy, PhD, MBA

Advisor & Seed Investor

AKOUSTIS



Steven DenBaars, PhD

Advisor, Seed Investor &
Director



SORAA

SLDLASER

AKOUSTIS



Palvi Mehta

Director



Richard Ogawa, JD

Advisor & Seed Investor



John Paglia, PhD

Director

PEPPERDINE | GRAZIADIO
BUSINESS SCHOOL

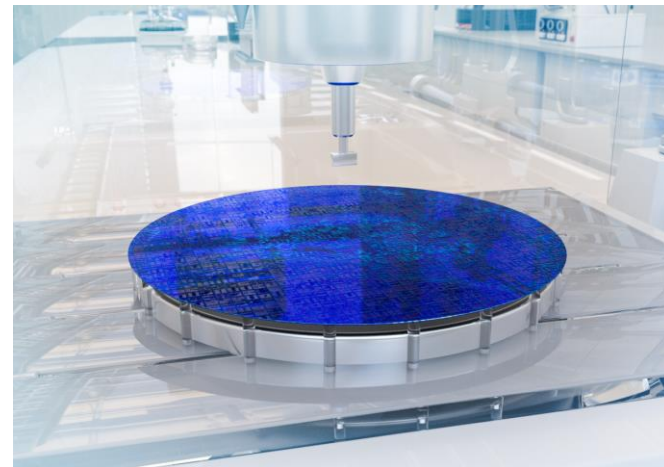


Aeluma: What's planned for the next ~12 months



Building on our Momentum

- Early revenue from ongoing customer contracts
- Pending government contract with industrial partners
- CHIPS Act opportunities
- Further establish production-scale foundry process
- Further business development opportunities
 - Continue to focus on automotive LiDAR
 - Broaden scope to include industrial LiDAR, robotics, defense & aerospace, communications, mobile, AR/VR
- Next generation devices including APDs
- More inventions and patent protection



Ready Aeluma for Mass Market Scale



Sensing Reimagined™

Company Contact:

Jonathan Klamkin, CEO

Aeluma, Inc.

805-351-2707

jonathan.klamkin@aeluma.com