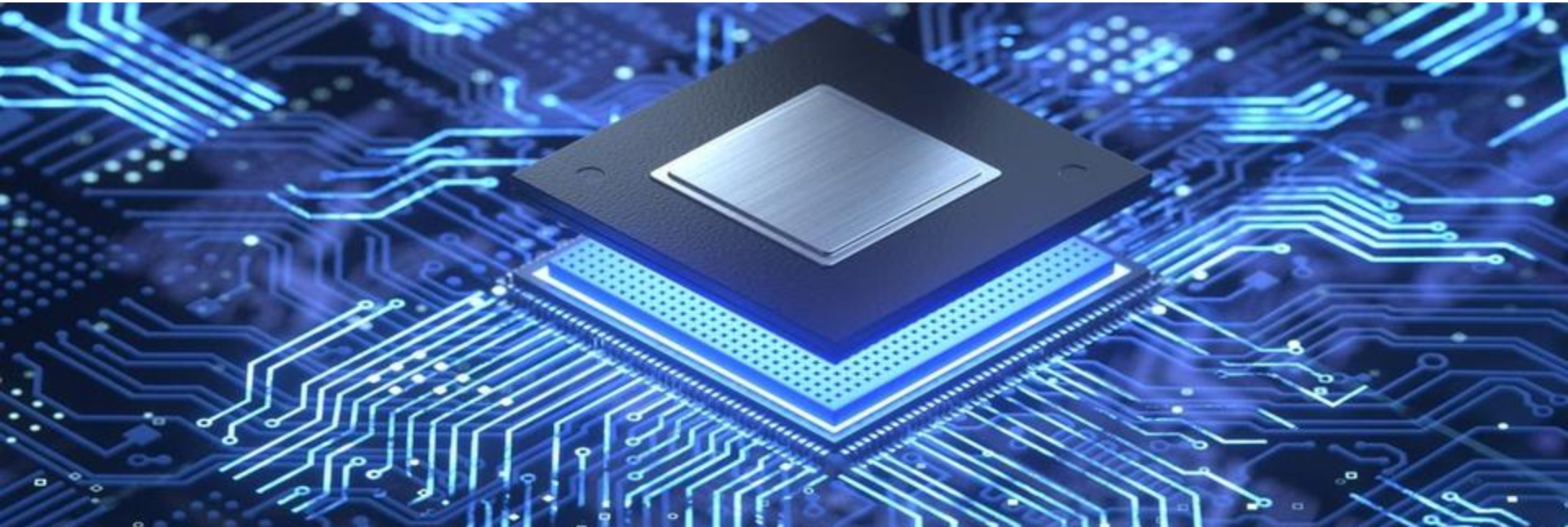
Silicon Catalyst:
Accelerating Semiconductor Innovation

Raúl Camposano, Managing Partner

it's about what's next.®



Thesis - Consensus among policymakers, technologists, and scholars

- The race for AI supremacy will determine who leads **economically, technologically, and militarily**, conferring strategic advantages. The outcome will also shape the future balance of power, governance models and the ideological direction of international norms and standards.
- AI is **hardware limited** — progress in AI capabilities depends heavily on improvements in **silicon**, memory, interconnects, and data center infrastructure.

(It May Also Be Existential)

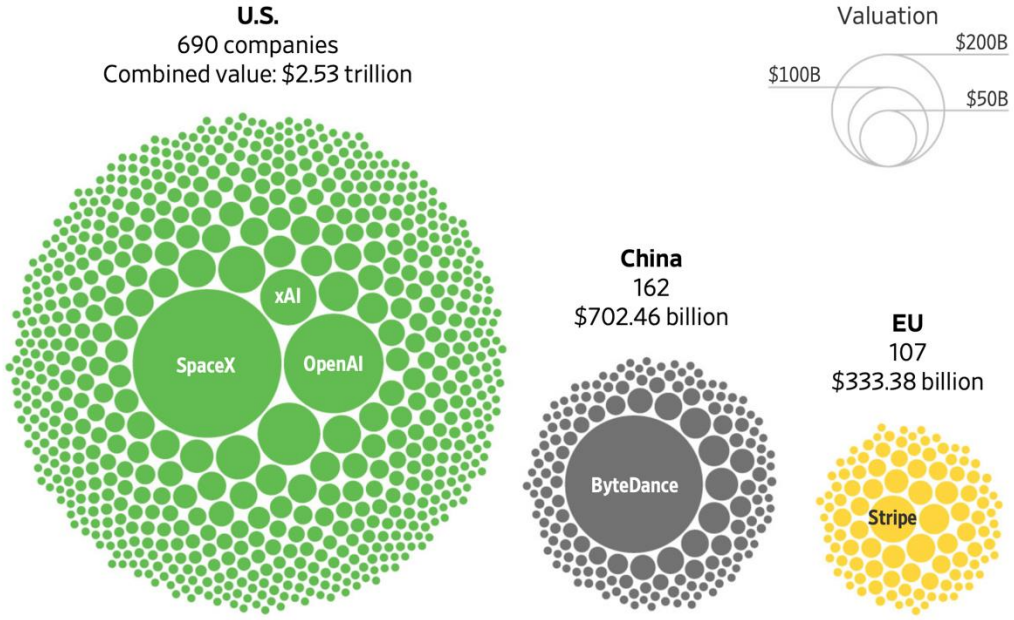
- The race to develop advanced AI is not just about technological progress or economic gain, but about the **future survival and autonomy of humanity itself**. The existential risk arises from the potential for AI to surpass human intelligence, gain strategic advantage, and act in ways that could be uncontrollable or misaligned with human values.

AI HW and SW Spending

- **Semiconductor Market Impact**: Investments in AI chips and processors nearly doubled in 2024, reaching **$112 billion**, significantly contributing to the global semiconductor market, which exceeded $626 billion
- **AI-specific software** global spending in 2024 was projected to reach approximately **$110 billion.**

Various Sources, chatgpt, Forrester, IDC

Private Companies, Start-Ups



Private Tech companies valued >$1B
January 7, 2025
Source: CB Insights
Andrew Barnett/WSJ

More Specifically, AI-Specific VC investments (2024)

- US United States $97B **74%**
  - Total VC investment $209 billion
  - Key recipients: OpenAI $6.6B, xAI $6B, Anthropic $4B, Databricks $10B, Waymo $5B
  - Nvidia R&D: $8.7B
- EU Europe Total $8B-$13.7B **6%-10%**
  - Total VC investment $51 billion
  - United Kingdom: Leading in AI startup hubs
  - France: Secured over €1.3 billion across 14 deals
  - Germany: Raised €910.3 million over 23 deals
  - Notable deals include Mistral AI's $640 million Series B round
- CN China $7.6 billion **6%**
  - Total VC investment: $33.2 billion (a 32% year-over-year decline)
  - DeepSeek: AI model rivaling Western counterparts at significantly lower costs
  - MiniMax: Raised $600 million in a round led by Alibaba, achieving a valuation of $2.5B

Various Sources, chatgpt, KPMG, Crunchbase

Yet, Little Appetite for Semi Startups…

- Sustained decline of venture capital for semiconductors
- Most investments go into SW
- Escalating cost/time of HW design, prototyping access
- Achieving product-market fit is challenging
- Customers reluctant to award design wins to startups

Content

- How did we get here?
- The rising costs of innovation, a decline in venture capital, and challenges in achieving product-market fit
- Silicon Catalyst
- Summary, Opportunities, Strategies

Brief History of Semiconductors

1950's –Bell Labs invents the transistor, dissemination through licensing core technology

1960's – Invention of ICs, Venture Capital and Startups in Silicon Valley

1970's – Commercialization of DRAM and Microprocessors Intel, becomes killer-app

1980's – Japanese DRAM threat leads to formation of SIA/SRC/SEMATECH to restore US competitiveness

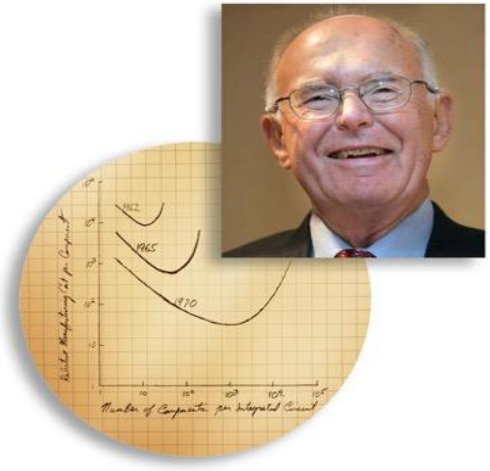
1990's – Foundry business model lead by TSMC in Taiwan

2000's – Apple iPhone becomes new killer-app. Decline in VC investment. End of Dennard scaling

2010's – Emergence of the Chinese threat, pricing power

2020's – AI becomes the new killer-app. Government interventions, Chinese access restrictions

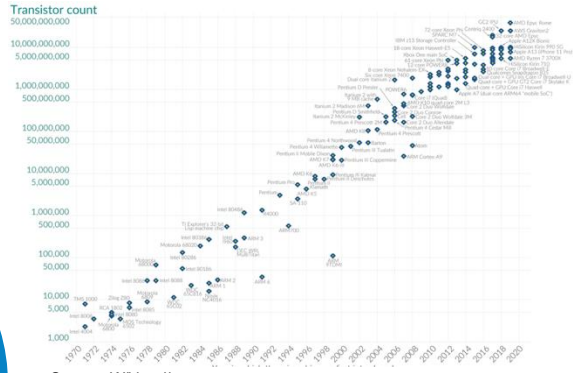
A Virtuous Cycle



More R&D (innovation)

Lower cost/function

Transistors on a Chip



Source: Wikipedia

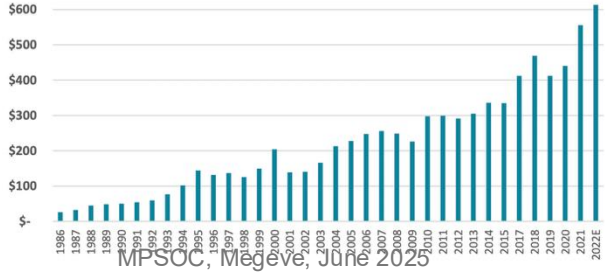
Moore's Law

Expanding applications (more silicon)

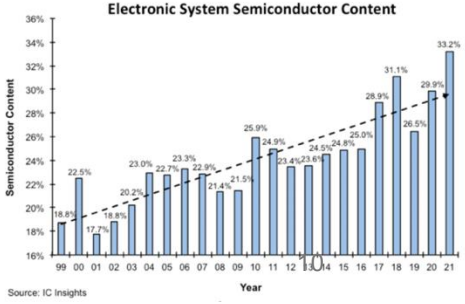
Courtesy Dan Armbrust

Increasing semiconductor revenue

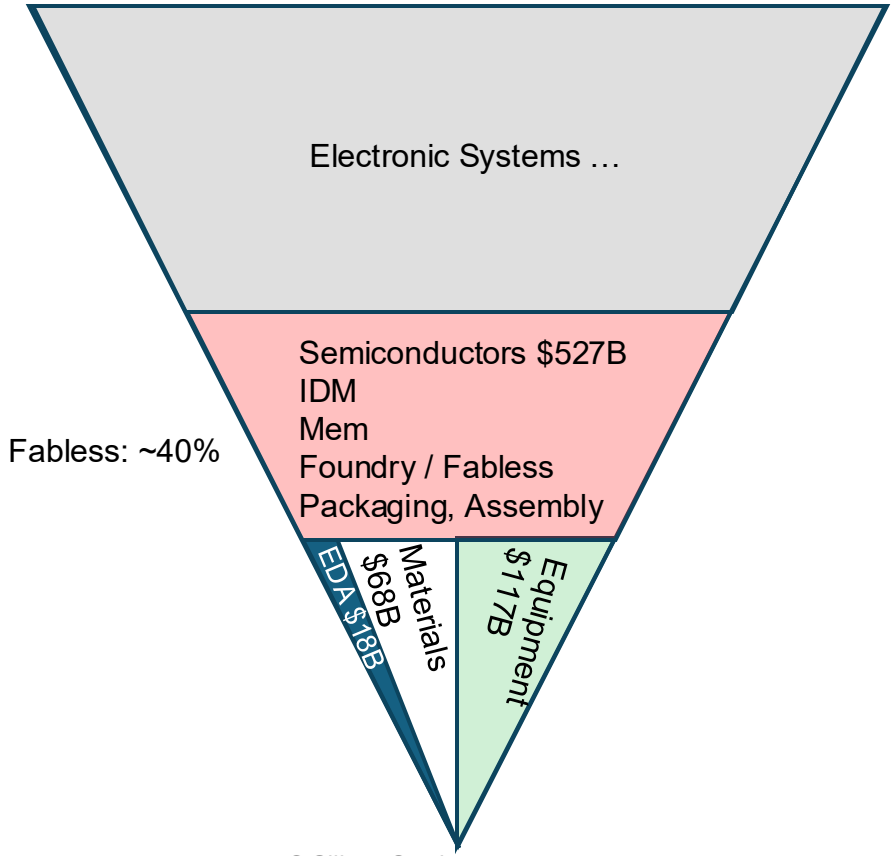
Semiconductor Revenue



Source: WSTS

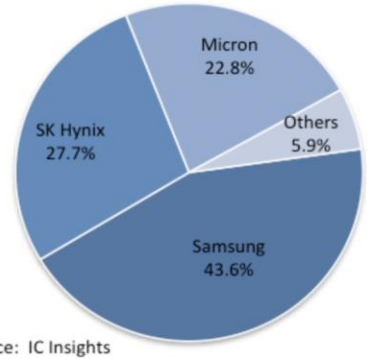


Supply Chain Fragmentation



Consolidation within Segments

DRAM Market Share



Source: IC Insights

GPU Market Share

Year	NVIDIA	AMD	Intel
2022	81.9%	16.8%	1.33%
2023	81.5%	17.17%	1.33%
2024	88%	11.75%	0.25%

https://pcviewed.com/nvidia-vs-amd-discrete-gpu-market-share/

Mobile Applications Market Share

As of 2024, **Arm** Holdings recorded **a close to 100%** market share within the mobile applications market.

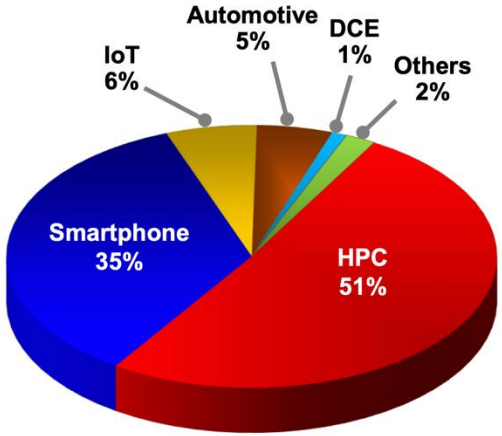
Source: Statista

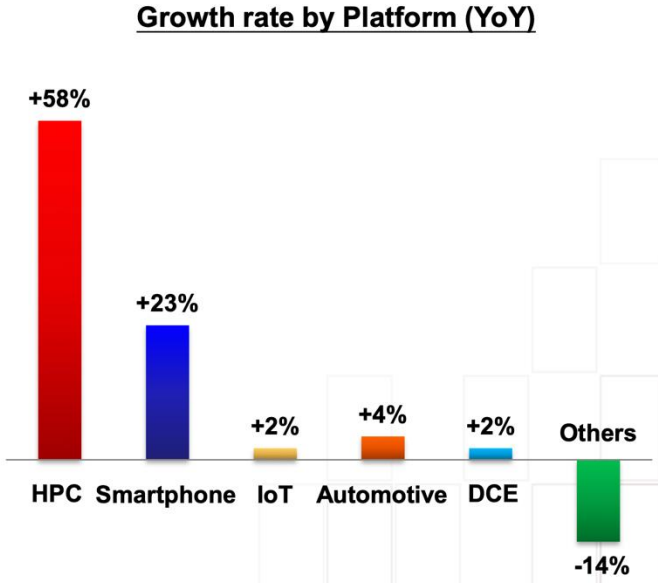
CPU Market Share

Year	Intel (%)	AMD (%)
2022	71.00	29.00
2023	70.50	29.50
2024	76.00	24.00
2025	75.3	24.7

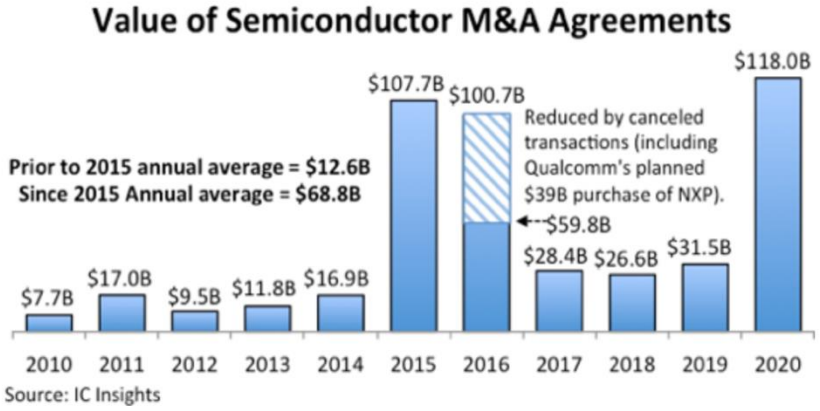
Source: PCViewed

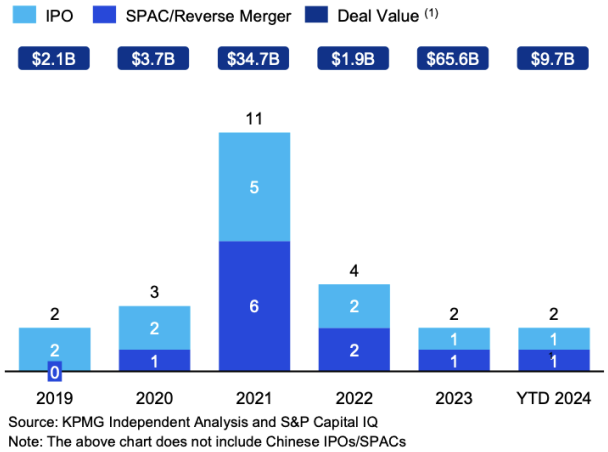
2024 Revenue by Platform





Consolidation





Source: KPMG Independent Analysis and S&P Capital IQ
Note: The above chart does not include Chinese IPOs/SPACs

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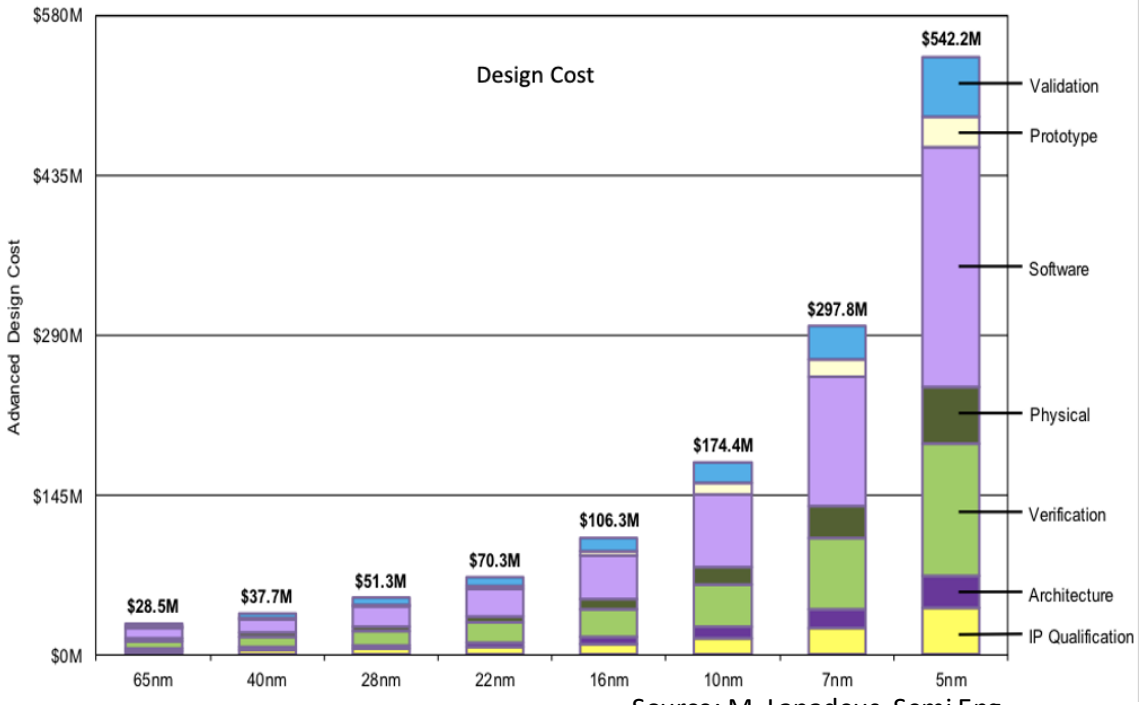
Rising Design Cost



Source: M. Lapadeus, Semi Eng.

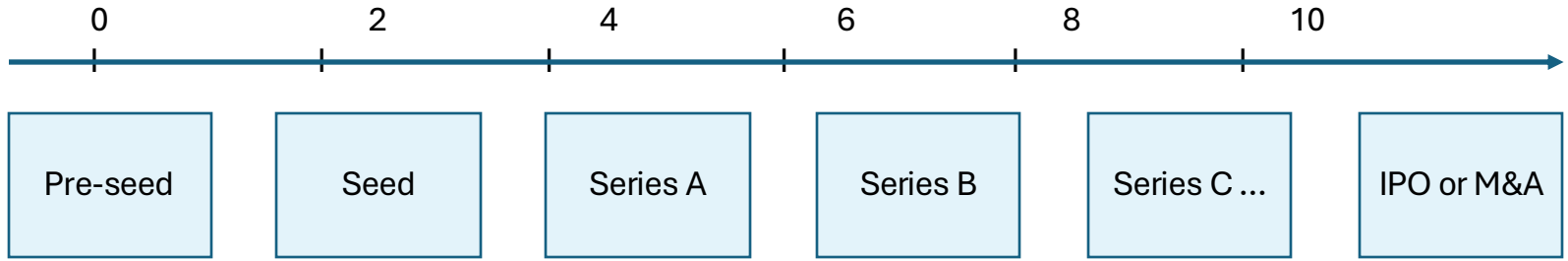
Node	Mask set cost [2]
250nm	$43K
90nm	$165K
28nm	$1.2M
7nm	$10.5M

Source: IC Knowledge

The VC Model

- 1-2% administration fee for OpEx, 20% carry (profits)
- Goal is return 3-5x or 20-30% annual IRR over 10 years
- Invest in 20-30 companies, 0.1-1% of deal flow
- 1-3 companies return 10-100x of investment
- Each funding round is lead by a new VC that sets terms
- Pro-rata rights are key
- VCs track record of funds allows them to raise follow-up funds

Semiconductor Startup Timeline



Funding Source	Self / F&F Angels SBIR, etc. NSF, DOD, DOE, DARPA	Angels VC and CVC SBIR, etc. NSF, DOD, DOE, DARPA	VC and CVC SBIR, etc. NSF, DOD, DOE, DARPA	VC and CVC	VC and CVC Growth VC	IPO Corp M&A
Fund raise ($M)						
Min	0.5	1	5	20	30	100
Medium	1-2	2-5	10-20	30-70	50-100	200-300
Max	2	15	100	150	150	500

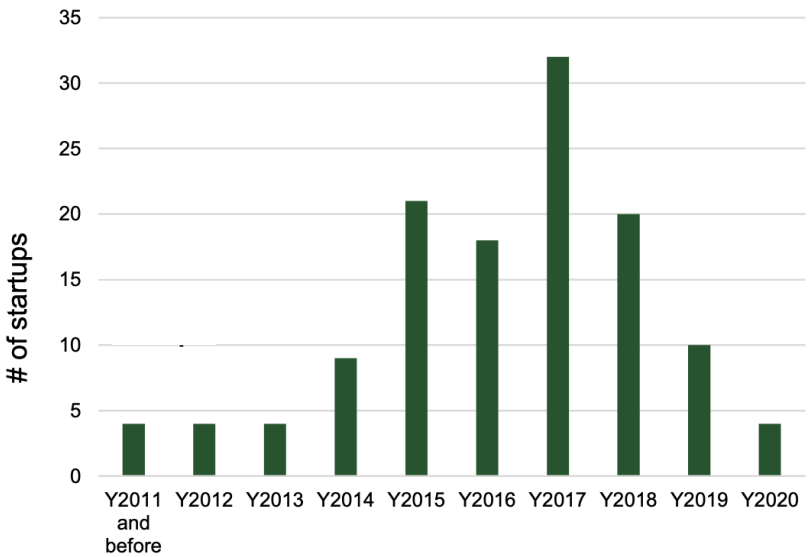
Courtesy Dan Armbrust

VC model dictates where investments are made

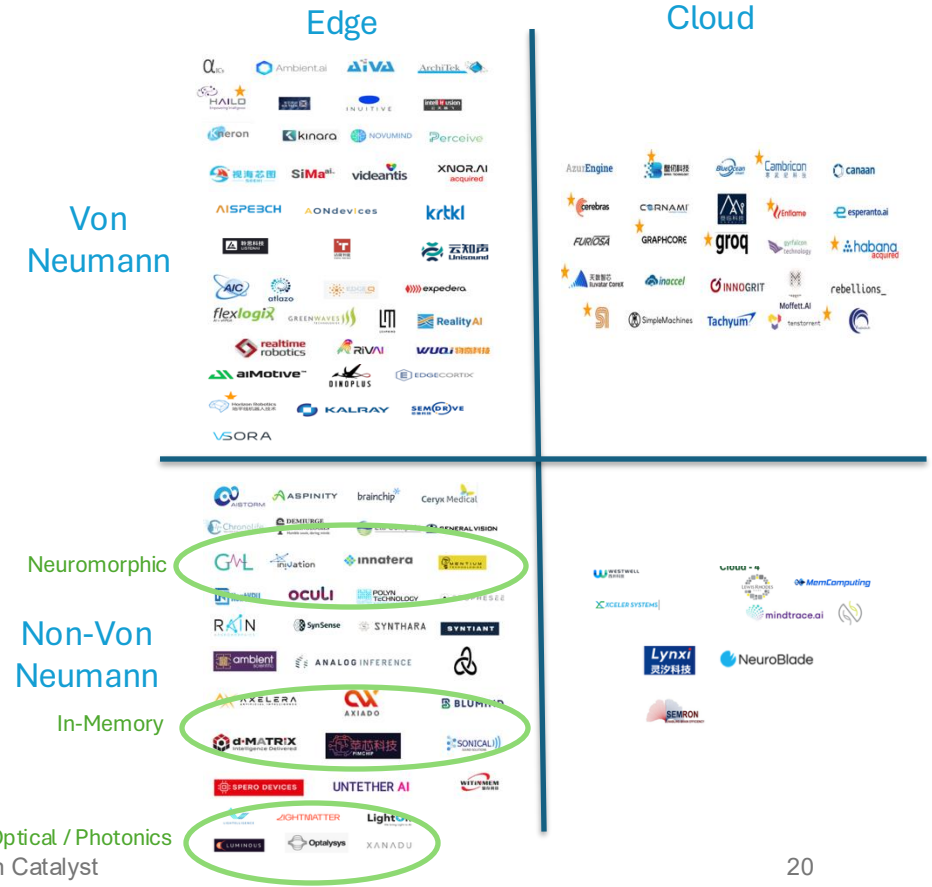
- Semiconductors are less attractive compared to other opportunities
  - High capital required
  - High failure rates
  - Long time to revenue ramp
  - Long time to liquidity
  - Low returns
- MVP is often the product; market fit is hard to predict
- Small expert community (e.g., compared to SW)

First Wave, Poor Product Market Fit

AI/ML startups formation



Source: Woodside Capital Partners

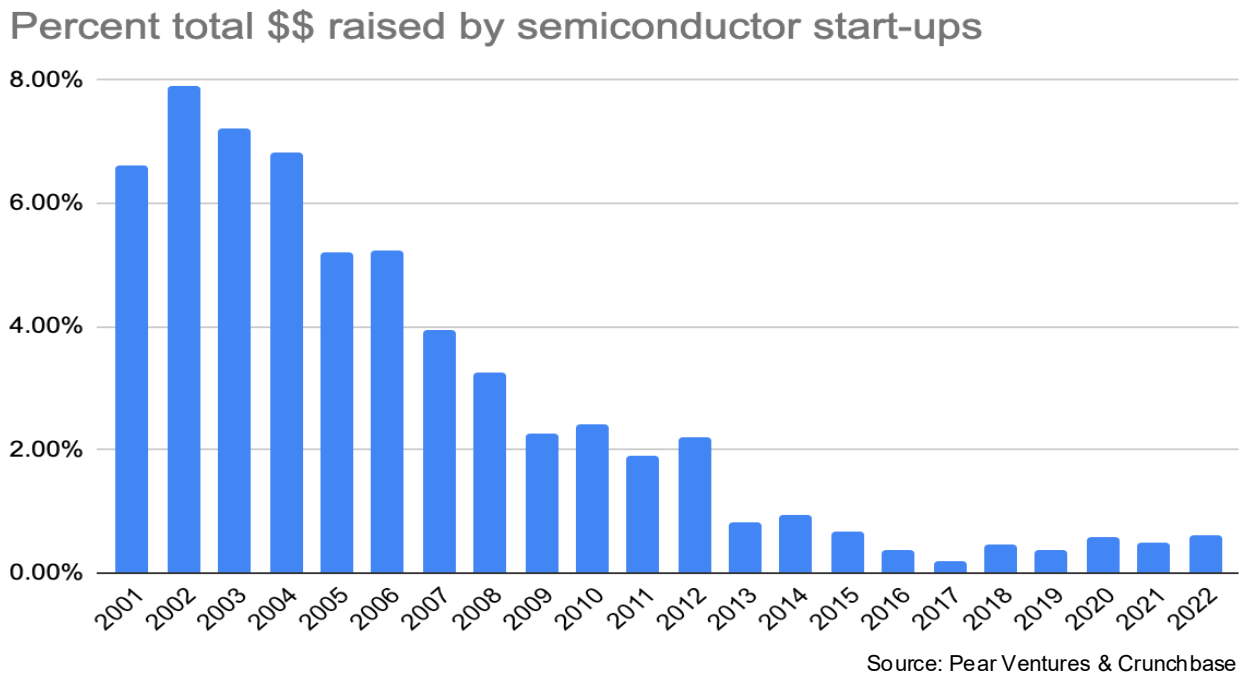


System Companies becoming Silicon Houses

	Apple	Google	Amazon	Microsoft	Meta	Baidu	Cisco	Huawei	Samsung	IBM
System		↓	↓		↓					
Chip Design limited	↓			↓		↓	↓	↓	↑	↑
Chip Design extensive										
Chip Mfg										

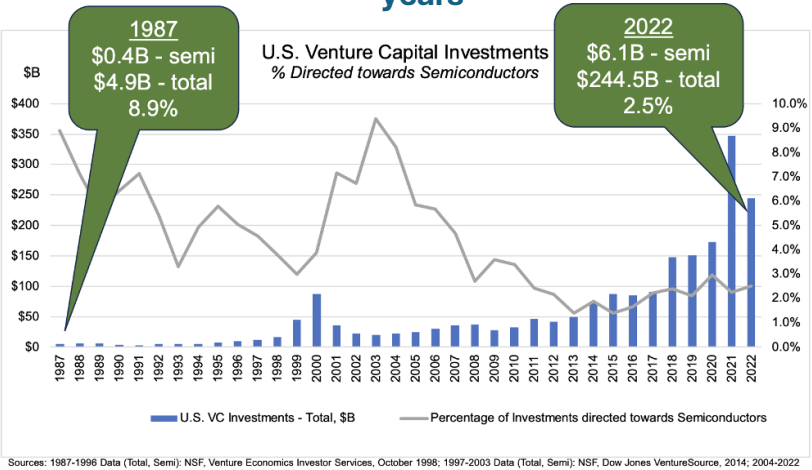
Source: VLSI Research (modified), courtesy Dan Armbrust

Decline in VC investments in Semiconductors (exact numbers are impossible to obtain)



Semis not Benefiting from VC $ Ramp

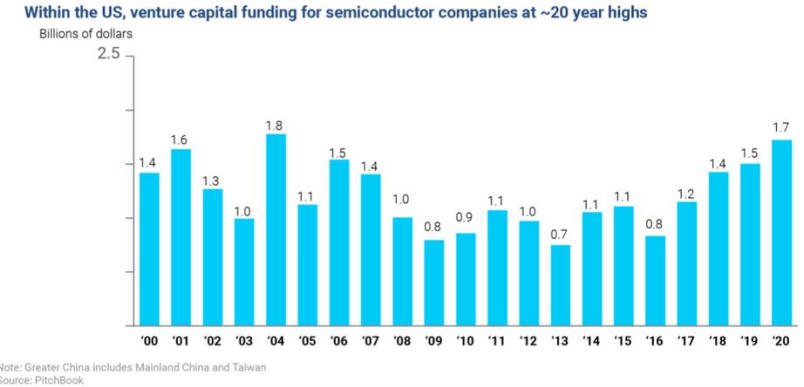
US VC investments over 25 years



Sources: 1987-1996 Data (Total, Semi): NSF, Venture Economics Investor Services, October 1998; 1997-2003 Data (Total, Semi): NSF, Dow Jones VentureSource, 2014; 2004-2022 Data (Total): National Venture Capital Associations (NVCA); Pitchbook, 2023; 2004-2022 Data (Semi): Pitchbook, Deloitte, December 2021

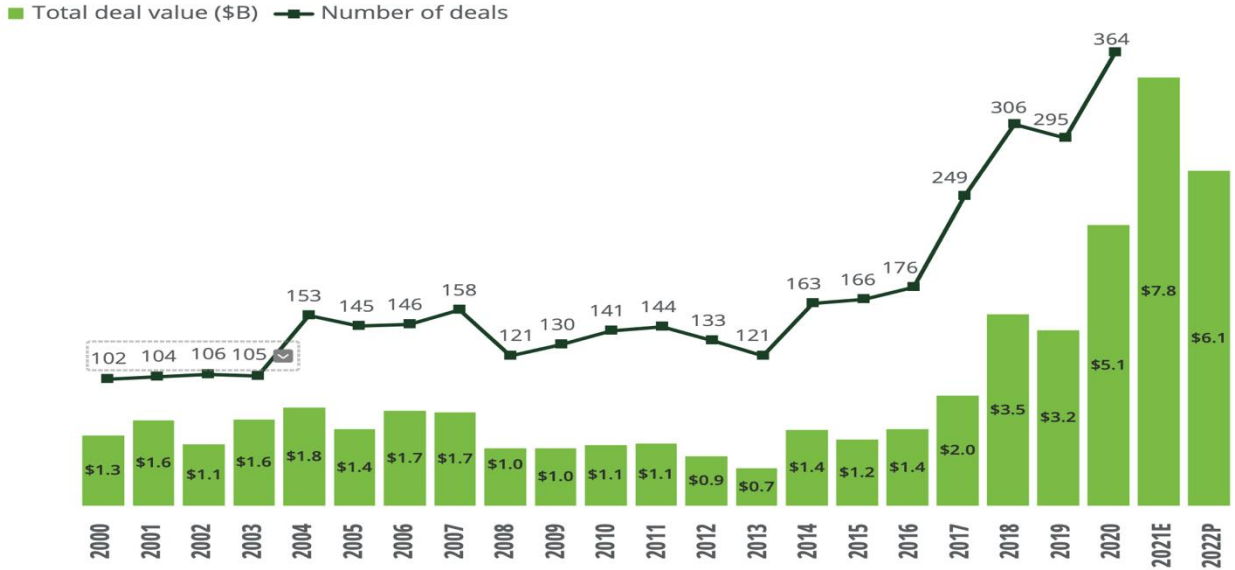
CHIPS IAC Organization/PPP Working Group November 8, 2023 Public Meeting

US VC investments in semiconductors



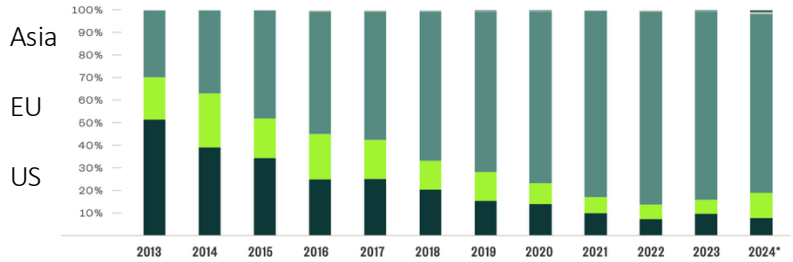
Note: Greater China includes Mainland China and Taiwan
Source: PitchBook

Decline in VC investments in Semiconductors



Source: Deloitte

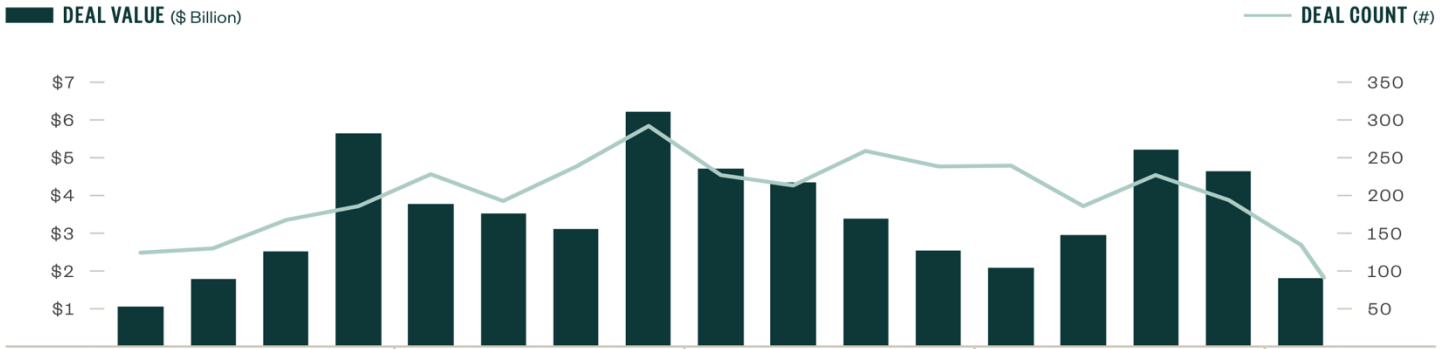
Mostly China now



Source: MossAdams

Decline in VC investments in Semiconductors

FIGURE 1: Semiconductor VC Deal Activity by Quarter



	2020				2021				2022				2023				2024*
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
VALUE	$1.0	$1.8	$2.5	$5.6	$3.7	$3.5	$3.1	$6.2	$4.7	$4.3	$3.4	$2.5	$2.1	$2.9	$5.2	$4.6	$1.8
COUNT	123	129	166	184	227	191	237	291	226	212	258	237	238	185	226	192	133

*As of 03/31/2024

Source: MossAdams

Steady, mostly China in recent years

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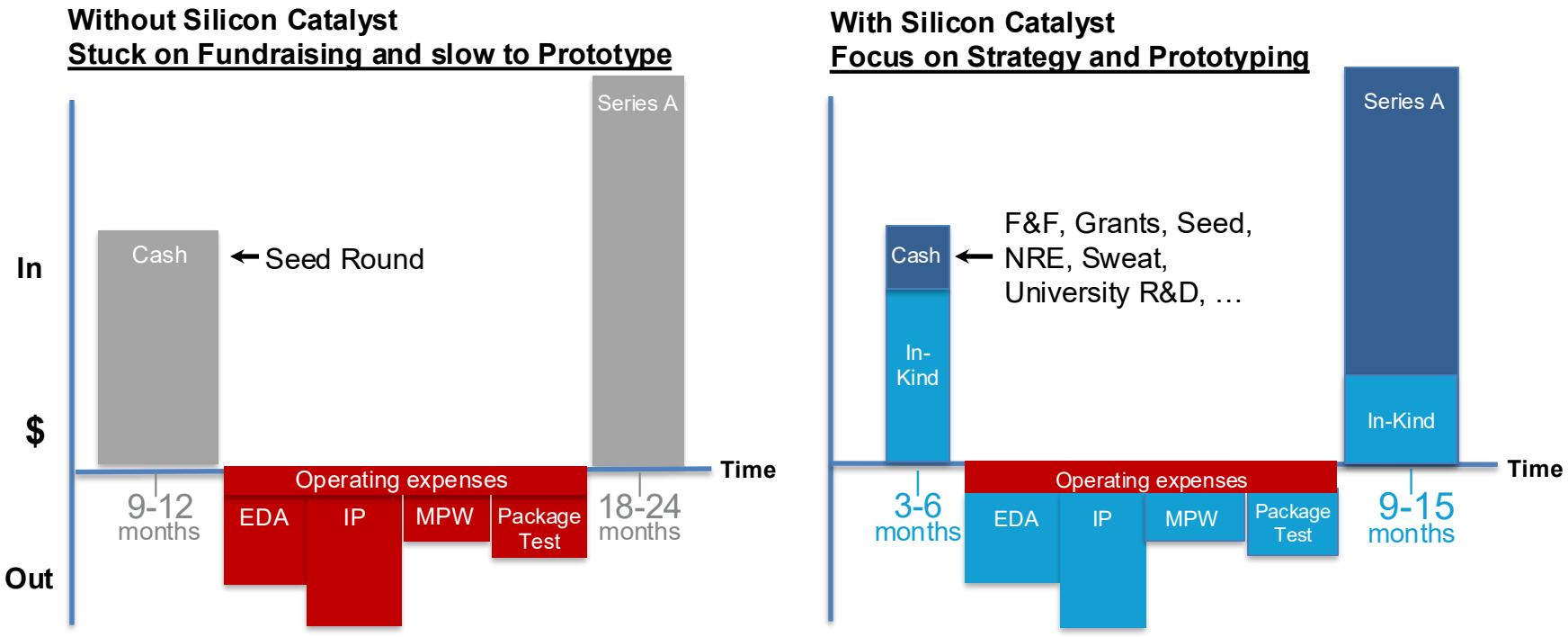
it’s about what’s next.®

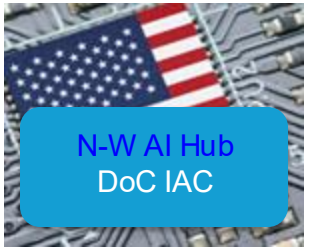
- Silicon Catalyst is the only incubator + accelerator focused on the Global Semiconductor Industry
- Founded 2015 in Silicon Valley (Rick Lazansky, Dan Armbrust, Mike Noonen)
  - Si Catalyst Israel 2019
  - Si Catalyst Angels 2019
  - Si Catalyst UK 2021
  - Si Catalyst EU 2024
  - Si Catalyst Ventures 2024
- Expanded from purely Chips to Chiplets, Materials, IP, Silicon fabrication-based Photonics, MEMS, Sensors, Life Science and Quantum

Reduces the Seed Investment *and* the Time to Prototype



Silicon Catalyst receives common equity in exchange for incubation

Ecosystem Centered on Startups



International
Israel, UK & EU
Management Services

35+ Universities

Industry Partners

Accelerators

Good for Startups, Partners, Investors, Advisors … the industry

Silicon Catalyst's Strategic Partners

Strategic and early access to Semiconductor Innovation

Powerful Network = Great Events (~ 40 WW events/year)

Portfolio Update May 15, 2025
Computer History Museum, Mountain View

UK Quarterly 2024


Portfolio Update June 5, 2024 TI, Santa Clara

Driving Innovation by Accelerating Startups

>1,200 reviewed ~10% admitted

Sourcing **Screening** **Incubation/Acceleration** **(24+ Months, custom program)** **Exit**

New and serial entrepreneurs

University researchers

Industry spin-outs

Si SILICON CATALYST

Advisors

In-kind partners ($2M+ goods and services)

Investors (SCA & SCV)

Silicon Catalyst

Strategic partners

Management services (events, strategy, marketing, product VP, team, funding)

Training (experts and curriculum)

Powerpoint ⍰ Prototype ⍰ Production

Portfolio Companies in Incubation

Memories

- High-density volatile embedded memories on standard CMOS
- Intelligent Memory Chiplets
- Innovative DRAM technology for data-driven computing

AI

- Architectural optimization of RISC-5 instruction sets for performance improvement
- Build brains not just networks
- The "tiny" embedded technology company
- **GigantoR** Giants of Edge AI acceleration
- Accelerating & protecting compute-intensive applications
- Convergence of Sensing and Communications

Photonics

- AI Compute at the speed of light
- Overhauling Decades of LED Display Technology
- Embedded infrared lighting solutions
- Zero-power sensors with uninterrupted operation

Communication

- Innovative spectrum slicing for Wi-Fi
- Backscatter technology
- ultra-low power die-to-die interconnect

Imaging

- Sense and image objects at high resolution using GHz ultrasound
- Democratizing Terahertz spectrum through CMOS phased array technology

Materials

- Cubic GaN
- **QPT**: A radical topology to unleash the performance of GaN
- Turbocharges CMOS to Higher Performance of the NEXT NODE
- UV-curable metal oxide inks

- PUF Based PQC
- Homomorphic encryption

Portfolio Companies become Alumni

EXITS: Acquired by XYZT (2022)[1], Acquired by Nexperia (2020)[2], Merged into Ectron (2020)[3], Merged into Pasqal (2024)[4]

Example Outcomes

SigmaSense
Raised $55.3M

$1B Valuation
Ayar Labs

OWL
Raised $15M

ERIDAN
Raised $60M

quadric
Raised $46M

SPARK MICROSYSTEMS
Raised $55.3M

EXOKERYX
Raised $13.8M

Xceler Systems
Merged into Extron in 2020

EcoCircuits
Acquired in 2020

Seamless Microsystems
Digitizing Your World Seamlessly
Acquired in 2022

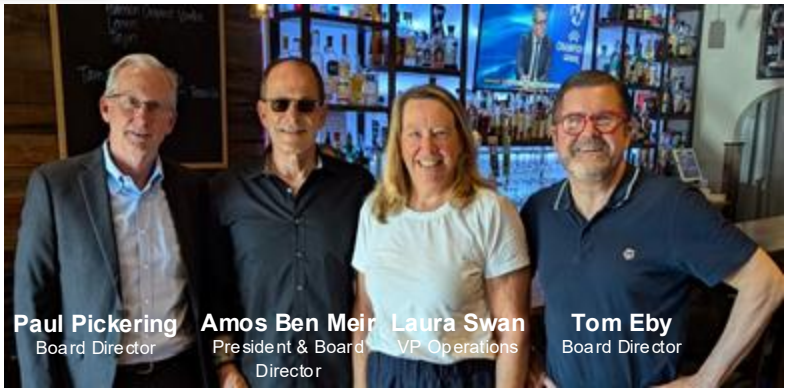
PCs valuation > $2.5B
Raised
>$800M in VC
>$200M in IKP
>$200M in Grants

Synthara.ai
Raised $11M

Silicon Catalyst WW

Silicon Catalyst Angels

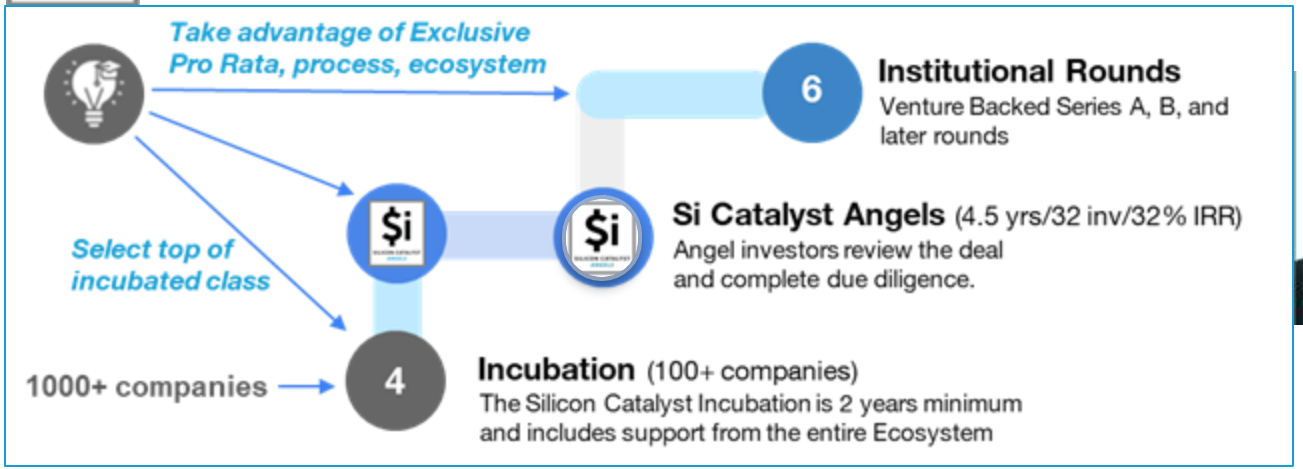
Syndication Partners



- Launched in July 2019 to provide funding in Seed and Series A rounds
- >60 members, are accredited investors from the Silicon Catalyst ecosystem
- Investing primarily in companies in the Silicon Catalyst portfolio companies
  - Owl AI, Eridan, Espre, Dover, Mentium, Ayar Labs, Imprint Energy, Oculi, mmTron, Lelantos, Phinomics, Lemurian Labs, EnCharge AI, Xcelerium, Zepsor, PolyN, RAAAM, ABR, Probius, Exokeryx, Neurophos, Phosio…
- 40 investments >$10M with syndication!

MHNW Consortium

Silicon Catalyst Venture Fund



Venture Team

- **>15 Investments in the 1st year of Operations**
- **Fund $13.7M, 10/9/24**

Source: Crunchbase

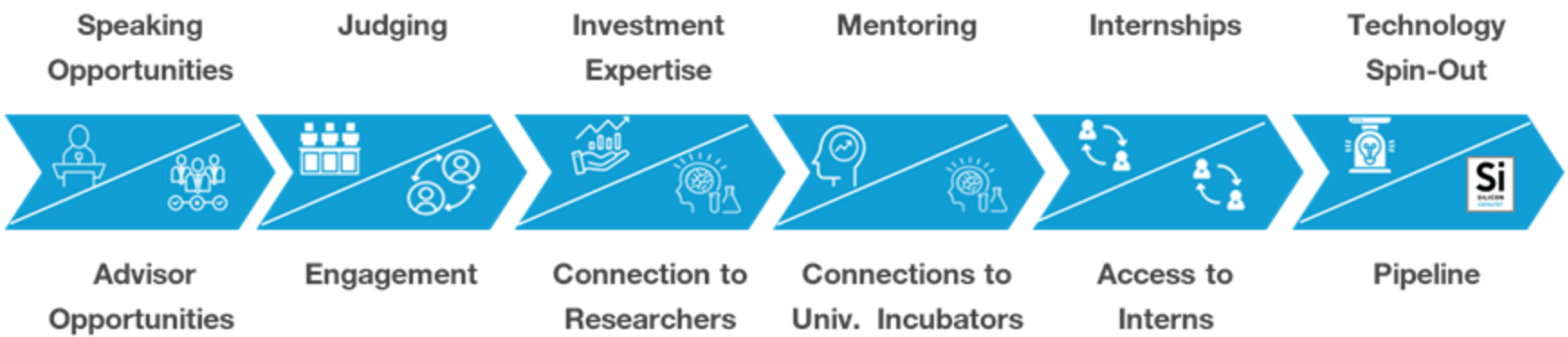
Silicon Catalyst University Program

~1/3 of Portfolio Companies come from Universities

Connects the world's leading universities with the Silicon Catalyst ecosystem.

The Ambassador program provides a bridge from the Silicon Catalyst advisors to their alma maters to engage with professors and their students considering building a company.

What do Universities get out of the deal?



What does Silicon Catalyst get out of the deal?

Silicon Catalyst Management Team

>100 startups, >$1B in VC, >$80B as execs in public M&A

Pete Rodriguez
CEO, Director

- Dir. Si Catalyst UK & EU LTD
- Dir. Si Catalyst Ventures
- VP & GM NXP, CEO Exar
- CMO Virage, CEO Xpedion, Mgr. LSIL

Nick Kepler
COO, Director

- VP Products Suvolta
- VP DE/PM Global Foundries
- VP Process Tech AMD

Management Services

Strategic Initiatives

Tarun Verma
Managing Partner

- Sr Dir Altera

Richard Curtin
Managing Partner

- Founder & Exec Nucleos
- Sr Dir and GM NXP
- Angels by the Sea
- Exec at 11 Startups

Laura Swan
Managing Partner
VP OPS Si Catalyst Angels
GP Si Catalyst Ventures

- **Investor Sand Hill Angels**
- Co Founder The Batchery
- Engr. PM at sev. NW startups

Paul Pickering
Managing Partner
Dir. Si Catalyst Angels

- CRO Micralyne Inc
- EVP Sales & Marketing Exar
- EVP Sales & Mkting Xpedion
- Exec at 9 startups

Raul Camposano
Managing Partner

- CTO GM, SVP Synopsys
- CEO Sage DA (AMAT)
- CEO Nimbic (Mentor)
- CTO Silvaco (IPO)
- Prof. Paderborn, Stanford

Lance Bell
Managing Partner

- **CEO LGB LLC**
- CEO and Co-Founder Nanobionovum, LLC

Atiye Bayman
Managing Partner

- CTO MiaSolé
- Dir Technology Novellus
- Yield Mgr Synergy
- Sr. Process Engr. AMD

Jessica Binzoni
Associate Partner

- **Founder EDir Hope+Future**
- Attorney & Fellow NIJC
- Magna Cum Laude Notre Dame Law School

Dennis Meister
Managing Partner

- SVP Siemens Health
- Product Dir. GE Healthcare
- VP & GM BU Acuson
- Startup CEO

Tom Sandoval
Managing Partner

- VP Renesas/SVP Dialog
- VP Xilinx
- CEO Calypto
- VP & GM LSI Logic

Dave Dwelley
Managing Partner

- CTO Maxim Integrated
- CTO Office Linear Tech.

James Lougheed
Managing Partner

- VP & GM Maxlinear
- SVP Exar
- Mgmt.: Cirrus, Future, EDMI

Israel

UK

Barcelona

Non-employee Board (active & investors)

Danny Biran
Managing Partner

- VP Israel Innovation Authority
- SVP Mkting & Strategy Altera
- Director GSA
- CEO SilverbackSys
- Exec LSIL, NSC

Moshe Zalcberg
Managing Partner

- **CEO Veriest Solutions**
- GM & VP BD Presto Eng.
- GM Israel Cadence
- VP EU Services Cadence

Sean Redmond
Managing Partner
Dir. Si Catalyst UK LTD

- Vice Chmn ElecTech - UK
- VP Arc
- VP EMEA Cadence
- VP & GM EU Verisity

Russell Haggar
Managing Partner

- **Exec Chmn. Vyper Core**
- Founder Molten Ventures
- Leading UK VCs
- Over 30 startups

Mike Staplehurst
Managing Partner

- Sr. Dir ARM
- Associate DBA
- CEO Solar Cloth
- Dir ARM

Ross Addinal
Managing Partner

- CTO Vertizan
- CAE Synopsys
- Tech Dir EU Ciranova
- Account Mgr Cadence

Francesc Bach
Managing Partner

- **CEO Barcelona Ventures**
- Investor Clex
- CFO EM Grup
- Finan. Mgr. Morera Group

Rick Lazansky
Chairman, co-Founder

- CEO Silicon Catalyst (former)
- Director Sand Hill Angels
- VP R&D XpedionAgilent
- Chmn & co-Founder Denali
- Exec at 15 startups

Dan Armbrust
co-Founder, Director

- **Chmn Salience, Exokeryx**
- CEO Silicon Catalyst (former)
- CEO Sematech
- VP Semi Ops IBM Micro

Esam Elashmawi
Director

- **CM&SO Lattice Semi**
- SVP and GM MicroSemi
- VP Actel Corp.
- Founder & CEO Si Expert

Dave French
Director

- **CEO Sigma Sense**
- **Chmn ANE**
- EVP NXP, V. Chmn ASMC
- CEO Cirrus Logic
- ADI, Fairchild, TI

Shih Wei Sun
Observer

- **Founder Si Catalyst VC**
- V Chmn, CEO, COO UMC
- Chmn AMF
- Chmn Smarter Micro
- Motorola, McKinsey

Summary, Opportunities, Strategies

- AI gold rush
- Significant opportunities such as Chiplet Technology, MEMS, Sensors, Photonics, Quantum Computing, and Life Sciences
- Silicon Catalyst has evaluated more than 1,200 early-stage semiconductor companies and has admitted over 120 companies into its 24-month incubation program
- PCs are worth >$2.5B
- Have raised
  - >$800M in VC
  - >$400M in IKP and Grants
- Strategies must include Incubation, VC and government programs such as ECA, ChipStart UK, US Chips Act, China “Big Fund”

Thank You!

it's about what's next.®