



CHIPSTART UK 2023 EDITION

# SILICON STARTUP SOLUTIONS

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A SILICONCATALYST.UK NEWSLETTER  
FOR THE UK SEMICONDUCTOR STARTUP COMMUNITY

A VALUABLE RESOURCE FOR THE SEMICONDUCTOR STARTUP COMMUNITY



# CHIP START | UK

the semiconductor incubator  
managed by SiliconCatalyst.UK



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UK Government



[www.siliconcatalyst.uk](http://www.siliconcatalyst.uk)

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We announced SiliconCatalyst.UK over two years ago with a launch event at Bletchley Park, The UK's heritage of innovation has truly been without parallel. In a time of grand peril, it was indeed the men and women at Bletchley Park, under the direction of Alan Turing who is widely considered to be the father of theoretical computer science and artificial intelligence, who saved the world. The technologists, innovators and visionaries who will plant their seeds of change in the fervent soils of ChipStart UK proffer the prospect of improving our lives. Following in a centuries long tradition tracing as far back as Isaac Newton and aided by Silicon Catalyst with its deep roots in Silicon Valley, the UK startups will be afforded every opportunity to change the world as we know it. And, as the slogan says, it all happens here.

The UK Semiconductor Strategy was announced on 19th May 2023. This identified the clear market failure for early stage UK semiconductor startups being able to achieve their first seed investment and find a path to commercialise their innovation into a scaling global semiconductor company. The first policy intervention to be released from the UK Semiconductor Strategy in June was the open tender to deliver a UK early stage semiconductor startup incubator to address this market failure. SiliconCatalyst.UK competed for this tender and was successfully selected to manage this new 9 month programme now called ChipStart UK. The application window for the first cohort opened in the first week of August for selection into the programme starting 16th of October. Successful applicants get access to the global Silicon Catalyst ecosystem of executive advisors, In Kind Partners including access to EDA tools, design IP and foundry plus support to help them achieve their first seed stage investment.

Following two rigorous live pitch sessions to panels of semiconductor startup experts from Europe and USA, 27 applicants to the ChipStart UK programme were reduced down to the first successful cohort of 12 UK semiconductor startups.

 <b>Blueshift Memory</b> Memory access innovation	 <b>Finchetto</b> Network switch photonics	 <b>HIDRA Vision</b> Wafer defect detection
 <b>HyperCIM</b> Compute in Memory	 <b>Mignon</b> New generation AI processor	 <b>MintNeuro</b> Neuro medical implants
 <b>Quinas</b> Revolutionary new memory	 <b>RED Semi</b> New processor architecture	 <b>SECQAI</b> Quantum security
 <b>Singular Photonics</b> Photon Imaging	 <b>Vaire</b> New computing paradigm	 <b>Wave Photonics</b> Silicon Photonics design IP

## SILICONCATALYST.UK TEAM



**Sean Redmond**

Sean Redmond has nearly 40 years of experience in the semiconductor and software industries. Starting his career as a chip designer, he led two market leading design teams. Firstly in digital stereo sound for television and then the first embedded mobile phone chip with VLSI technology. Sean was VP Europe for Verisity Design Inc, taking them from a standing start to over 160 customer sites throughout

Europe in 5 years. He instigated and led the strategic partnership with Arm, fueling its meteoric rise and successful IPO. Following their acquisition by Cadence, Sean became VP & GM of Cadence EMEA, doubling its business in 3 years. As VP WW Sales and Marketing for ARC, he helped turn its cash flow positive, leading to the eventual sale to Synopsys. In 2010 he founded and was CEO of Vertizan Limited, the developer of the Vitaq AI-driven Test Automation tool suite. Sean has recently worked closely with the UK government on industrial digital strategy, co-chairing the ElecTech council and became a core member of the Secretary of State's industrial digital leadership team. In 2021, Sean single handedly launched SiliconCatalyst.UK, bringing several years of successful Silicon Valley semiconductor startup incubation and acceleration knowledge to the UK semiconductor startup community. Sean has a BSc(hons), MSc EE from Kings College, London and MBA from Henley Management College.



**Russell Haggart**

Mr. Russell Haggart is a Co-Founder and serves as Executive Chair at VyperCore. He also co-founded Xsilon and served as its Chief Executive Officer. He is also an Angel Investor. He was previously a Partner at Esprit Capital Partners and Prelude Ventures. Russell has been active in the high-tech commercial industry for well over 20 years, graduating from deep technical roles into commercial and operational leadership

activities and including a productive six-year spell as a venture capital principal. Former companies include Element 14, Marconi, Madge Networks, 3Way Networks, Sagentia, XMOS, SiConnect, Prelude Ventures and DFJ Esprit. Russell is responsible for business development, marketing and product management activities



**Henry Nurser**

Henry has 40 years of international senior leadership experience in commercial, R&D (HW & SW) and high-volume manufacturing roles within the semiconductor industry. In addition to his role at Silicon Catalyst UK, he serves as an advisor to technology start-ups. Henry is passionate about building highly innovative, productive and motivated teams within both corporate and start-up environments, and has always been

driven by a desire to constantly look for ways in which things can be done better – whether this be around design flows, program management methodologies or business models.

Starting his career designing memories at Mitsubishi in Japan, Henry spent >25 years leading multi-national R&D projects and business organisations within STMicroelectronics. As founding CEO of Blu Wireless Technology, Henry built the company into an award-winning supplier of millimetre wave semiconductors and system solutions for multi-Gigabit 5G communication.

Henry has an MA in Electrical and Electronics Engineering from Cambridge University and 4 patents.



**Ross Addinall**

Ross has 30 years of international experience in a range of multi-national and startup IC and EDA companies with experience ranging from high-speed bipolar process and component design (ESD protection) through integrated circuits (Bluetooth, WiFi, DECT) to software systems (Connected Vehicles) and cloud based software products. Ross has held roles in pure research and development (CTO of a software

tool startup), services (Cadence VCAD) and technical sales. In all of these roles Ross has been drawn to either working with or supporting startup companies and is continually excited by getting the next great idea off the ground with a team of like minded individuals, by working smart as well as hard.

For the almost the last decade Ross has been a technical evaluator of funding proposals for commercialisation funds and disruptive technology funds.

Ross has a PhD in semiconductor physics (III-V compounds) from Imperial College, London and 3 patents.

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Silicon Catalyst is Bringing Its Unique Startup Platform to the UK

By Mike Gianfagna | SemiWiki | June 8, 2021

Silicon Catalyst is the world's only accelerator focused on semiconductor solutions. The organization has an extensive support infrastructure that includes preferred access to IP, design tools, business infrastructure and fab/assembly. They also provide a broad network of industry advisors and access to investment capital. In short, everything a silicon-based startup needs to get off the ground as quickly and efficiently as possible. We've covered many aspects of this special organization on SemiWiki. You can catch up on the buzz here. Read on for the details of how Silicon Catalyst is bringing its unique startup platform to the UK.

For those of us who live and work in Silicon Valley, it's easy to believe all silicon startups start here. In fact, there is ground-breaking work going on around the world. A recent press announcement detailing the newly admitted companies to the Silicon Catalyst accelerator drove home this point.



**SEAN REDMOND**

**CEO VERTIZAN LIMITED**  
**VICE CHMN ELECTECH - UK**  
**VP ARC**  
**VP EMEA CADENCE**  
**VP & GM EU VERISITY**

is making a big impact on the whole ecosystem – my opinion. To wrap up these questions, Silicon Catalyst explained that there are three new In-Kind Partners joining from the UK. These are the folks who provide all the support mentioned previously. They are: Agile Analog, SemiWise and SureCore.

Relevant questions include why the UK? And why now? Silicon Catalyst held a press briefing before the announcement that answered these, and many more questions. As for why the UK, some points were offered, below. I have added my own comments in parenthesis:

- Tremendous semiconductor talent recognized globally (remember Arm started in Cambridge)
- Top universities recognized globally (OK, we've all heard of Cambridge and Oxford)
- A history of innovation in semiconductor solutions (the UK leads the world in compound semiconductor development)
- An increasing number of UK startups have found Silicon

Catalyst and applied to the accelerator (Trameto/Wales, Salience Labs/Oxford are currently in the program)

As for why now, I think the answer is clear. Moore's Law is slowing – migration to the next process node is still important but a lot more is needed to keep things moving at the typical exponential pace. Hyper-convergent design solutions are the way forward. The intersection of multiple technologies in a dense and highly advanced package. Fueling this kind of innovation means new technology and new architectures. This is where startups make significant contributions and the support provided by Silicon Catalyst

Heading SiliconCatalyst.UK is Sean Redmond, an experienced semiconductor executive with international experience and a strong connection to the United Kingdom.

Sean has the background and experience to build a strong Silicon Catalyst presence in the UK. I had the opportunity to chat with Sean a bit. Sean has experience working with the UK government and so understands what's needed to ignite a higher level of innovation in the region.

Visibility, support and promotion of the UK's substantial innovation assets will be important in his view. Silicon Catalyst brings the right resources and focus to help. He described a new funding program from the UK government to fuel innovation – this will fit well with the startup acceleration provided by Silicon Catalyst. There is a memorable comment from Sean: *"The bedrock of technology development is semiconductor"*. I couldn't agree more.

The press release announcing the UK expansion provides

more background on the new operation. Noteworthy are the organizations that weigh in with supportive comments; the list includes Arm, STMicroelectronics, Synopsys and Real Ventures. Silicon Catalyst has substantial support across the semiconductor ecosystem.

The SiliconCatalyst.UK organization will be hosting a webinar for start-ups, university staff, investors, and potential in-kind partners on Wednesday, June 23, 2021. The webinar will feature presentations by Vaysh Kewada, CEO of Salience Labs in Cambridge and Huw Davies, CEO

of Trameto in Wales, both UK companies in the Silicon Catalyst accelerator, as well as other Silicon Catalyst partners and guest speakers. I encourage you to attend this webinar to learn more about how Silicon Catalyst is bringing its unique startup platform to the UK. Registration details will be available shortly, watch their website.

[semiwiki.com](http://semiwiki.com)

**SiliconCatalyst.UK Launch NEWS COVERAGE**



 <a href="#">Electronics Weekly</a>	 <a href="#">Reuters</a>	 <a href="#">Platform Executive</a>
 <a href="#">UK Government Department of International Trade</a>	 <a href="#">EE Journal</a>	 <a href="#">Channel News Asia</a>
 <a href="#">EE Times</a>	 <a href="#">EE News</a>	 <a href="#">mvproMedia</a>
 <a href="#">London News Online</a>	 <a href="#">U.S. News</a>	 <a href="#">Global Banking And Finance</a>
 <a href="#">New Electronics Magazine</a>	 <a href="#">Dataflog</a>	 <a href="#">MSN Money</a>
 <a href="#">Peter Clarke, Silicon 100</a>	 <a href="#">Kitco</a>	 <a href="#">London Stock Exchange News</a>
 <a href="#">Daily Telegraph (UK National Newspaper)</a>	 <a href="#">UK Times News</a>	

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## Silicon Catalyst Launches UK-based Accelerator

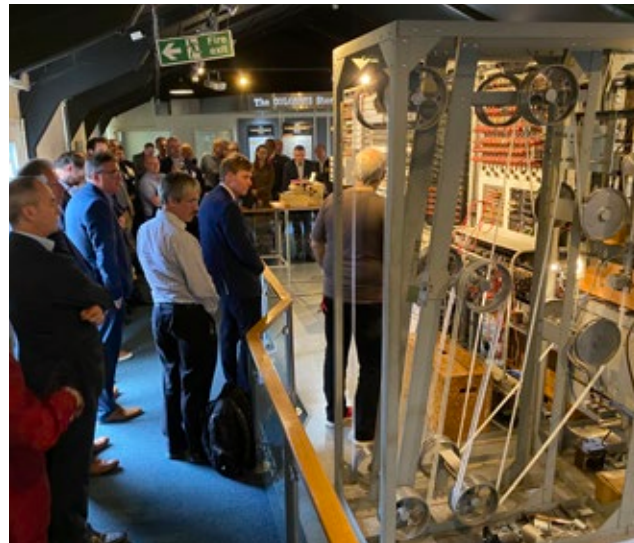
June 1, 2021 | Santa Clara, California and Stewkley, England

Silicon Catalyst is the world's only accelerator focused on semiconductor solutions, announced today SiliconCatalyst.UK, bringing Silicon Catalyst's platform locally to the UK and European start-up community. Heading SiliconCatalyst.UK is Sean Redmond, an experienced semiconductor executive with international experience and a strong connection to the United Kingdom.

Silicon Catalyst's mission is to help semiconductor hardware start-ups succeed. The ecosystem that Silicon Catalyst has created lowers the capital expenses associated with the design and fabrication of silicon-based integrated circuits (ICs), sensors, and microelectromechanical systems (MEMS) devices by providing advanced design tools and services from a comprehensive network of In-Kind Partners (IKPs). The Portfolio Companies in the Accelerator utilize IKP tools and services including design tools, simulation software, design services, foundry PDK access and MPW runs, test program development, tester access, and banking and legal services. The world-class Silicon Catalyst network of advisors and investors further facilitates their journey from idea through prototype toward volume production. See [siliconcatalyst.uk](http://siliconcatalyst.uk) for further background about the Accelerator.

"The UK has incredible innovation

through its world-class universities, already significant startup community, and support from the government," said Sean Redmond. "We look forward to working closely



Silicon Catalyst UK event participants at the Colossus Gallery, National Museum of Computing, [www.tnmoc.org/colossus](http://www.tnmoc.org/colossus)

with the U.K. start-up ecosystem, bringing a small part of Silicon Valley to further accelerate entrepreneurial teams to their full potential. We will be hosting a webinar on Wednesday, June 23, 2021 and invite members of the semiconductor value chain to attend and learn more about our comprehensive accelerator program." Registration details will be available shortly.

Nick Kepler, Chief Operating Officer of Silicon Catalyst, said "Silicon Catalyst exists to help start-ups, and we're excited for the opportunity to accelerate the technology innovation

happening in the United Kingdom. Over the last six years, Silicon Catalyst has made available to its Portfolio Companies over \$100 million dollars of in-kind services and helped them to raise more than \$250 million dollars in funding. In addition, many of our Portfolio Companies credit their success to the extensive network of nearly 200 advisors which saved them literally years by avoiding mistakes that most start-ups make."

"I am delighted to help launch Silicon Catalyst in the U.K. Having recently worked closely with the U.K. government, industry, and universities to guide their industrial digital strategy, this launch is a great opportunity to put that work into action for U.K. semiconductor start-ups," said Sean Redmond.

"Start-ups can capitalize on major growth opportunities in areas such as IoT and machine learning with fast, low cost and low risk access to best-in-class SoC design technology," said Phil Burr, senior director of strategic programmes, **Arm**. "Combining Silicon Catalyst's support with Arm Flexible Access for Startups, which provides free access to Arm IP and tools for prototyping silicon, will help startups get to working prototypes as quickly as possible, accelerating innovation in the UK."

"Silicon Catalyst has opened the doors to Silicon Valley for us," exclaimed Huw Davies, CEO of UK startup

**Trameto**. "In addition to affordable access to high-value In-Kind Partners like TSMC, Synopsys, and Advantest. Trameto has been strongly supported by experienced semiconductor industry veterans such as Mark Ross, ex-CTO of Cypress Semiconductor, as technology contributor and advisor, and John East, ex-CEO of Actel, as advisor."

"ST works with a large number of innovative tech start-ups across the world to help them develop and industrialize their products and get to market faster, targeting automotive, industrial, personal electronics and communication infrastructure applications," said Kirk Ouellette, Vice President Strategic Marketing and Strategy Development, **STMicroelectronics**. "Our engagement as a Silicon Catalyst Strategic and In-Kind Partner helps us find and engage with relevant start-ups, and surrounds them with the supportive Silicon Catalyst ecosystem that is critical to their success. We look forward with excitement to engage with many more start-ups and the various tech ecosystems in the U.K. with this additional Silicon Catalyst team."

"We are pleased to be working with SiliconCatalyst.UK to ignite the next generation of innovation," said Steve McDonald, **Synopsys** VP of Sales for Europe. "The strengthening economic pull from new market verticals for custom silicon is creating tremendous opportunity for chip design start-ups. With a distinguished track record enabling emerging businesses, Synopsys provides Silicon Catalyst portfolio companies with state-of-the-art tools and IP that reduce risk and accelerate time-to-market."

"It has been a pleasure for Real Ventures to partner with Silicon Catalyst over the past several years," said Mark McDowell, Partner at



Senior chip industry executives met at Bletchley Park to debate how to crack the code for U.K. semiconductor startup innovation and scaleup, appropriately in front of one of the code-breaking machines at the National Museum of Computing.

**Real Ventures**. "Silicon Catalyst is incubating a fascinating collection of semiconductor hardware start-ups. As investors in SPARK Microsystems we have experienced how the Silicon Catalyst ecosystem surrounds each start-up with support that de-risks our investment."

**Saliency Labs** joined Silicon Catalyst earlier this year and has already gained extensive value," said Vaysh Kewada, CEO of U.K. start-up Saliency Labs. "Silicon Catalyst provides start-ups with far more than in-kind services. It facilitates deep connections into the semiconductor industry through its advisors, who have spent time getting to know the company well, and then introduce and facilitate business-critical relationships. These relationships are already proving invaluable to Saliency Labs, and we look forward to continuing to work with Silicon Catalyst."

**Agile Analog**, based in Cambridge U.K., is Silicon Catalyst's newest In-Kind Partner. John Hartley, CCO said, "We look forward to helping the Silicon Catalyst Portfolio Companies

by quickly customizing their analog IP needs using our programmatic, systematic and repeatable methodology."

"As Silicon Catalyst has grown, we have been impressed that many of their start-ups are developing interesting technologies to address important problems in the world," commented Kirill Kuzmichev, Principal at **NanoDimension**. "In addition, the support of the Silicon Catalyst ecosystem, from partners providing tools and services to advisors providing expertise, increases the chance that each of these start-ups will succeed. Silicon Catalyst is one of the best places to look for good investments in semiconductor hardware."

More information is available at [siliconcatalyst.com](http://siliconcatalyst.com), [siliconcatalyst.uk](http://siliconcatalyst.uk), [siliconcatalystangels.com](http://siliconcatalystangels.com)

# Si SILICON CATALYST STARTUP SOLUTIONS

## Silicon Catalyst startup accelerator launches in UK

by Peter Clarke | eeNews Europe <https://www.eenewseurope.com/news/silicon-catalyst-incubator-comes-uk>

June 1, 2021 - Silicon Catalyst, the California-based accelerator focused on semiconductor startups, has announced the formation of a UK office.

Veteran EDA executive Sean Redmond is heading up [SiliconCatalystUK](#).

Silicon Catalyst was founded in Silicon Valley in 2014 as a mentoring and networking company, partly in response to a lack of venture capital funding. It provides startups with advice and lower-cost access to essential suppliers who in

return get to engage with pre-evaluated startups. More than 900 start-up companies have engaged with Silicon Catalyst since April 2015, with a total of 97 startup and early-stage companies being selected for admission to the accelerator.

The acceleration model has helped startups with the design and fabrication ICs, sensors and MEMS by providing advanced design tools and services from a network of "in-kind partners" and services that extend out to foundry PDK access, MPW runs and legal and banking services.

# Si Strategic Ecosystem Partners



# Si In-Kind Ecosystem Partners



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## Chip Innovators Join Forces with Government to Steer Future of UK Semiconductor Sector

3 August, 2023 | From: Department for Science, Innovation and Technology and Paul Scully MP

Experts working at semiconductor titans such as Arm, IQE and PragmatIC will meet with Technology Minister Paul Scully today (Thursday 3th August) at Imperial College London, as part of the first meeting of the Semiconductor Advisory Panel.

With industry and government working hand in hand to deliver the National Semiconductor Strategy, it offers a twenty-year vision for the sector around three key goals: growing the domestic semiconductor sector, mitigating the risk of supply chain disruptions and protecting national security.

Semiconductors are an essential component of almost every electronic device we use, and as a result are vitally important for the modern world we live in. From phones and computers to ventilators and power stations, nearly every piece of technology in the world depends on them.

The panel will be made up of ten experts from across the semiconductor sector, with representatives from business and technology, alongside experts in venture capital, skills and research.

This includes Richard Grisenthwaite, Chief Architect at Arm, the British-headquartered semiconductor firm that has designed billions of the world's chips, and Americo Lemos, CEO of IQE, a leading British advanced semiconductor manufacturer. The panel will also include Dr Eben Upton, CEO of the Raspberry Pi Foundation, a UK charity ensuring wider access to technology through the development of ultra-low cost computers.

Co-chaired by Technology Minister Paul Scully and renowned industry veteran and former Chief Executive of Dialog Semiconductor Dr Jalal Bagherli, the panel will provide the Government with advice and feedback on how it can support companies involved in the delivery of semiconductor products and ensure critical British industries have safe and steady access to the chips they need to drive innovation and grow the economy.

Future meetings will focus on how to nurture skills, improving access to finance, and developing

stronger international collaboration, setting out how industry can work directly with Government to achieve these goals.

Technology Minister Paul Scully said:

“Properly engaging and listening to the experts at the

heart of researching, designing and producing semiconductors is essential if we're serious about growing our domestic sector, protecting our national security, and unleashing rapid innovation across the British economy.

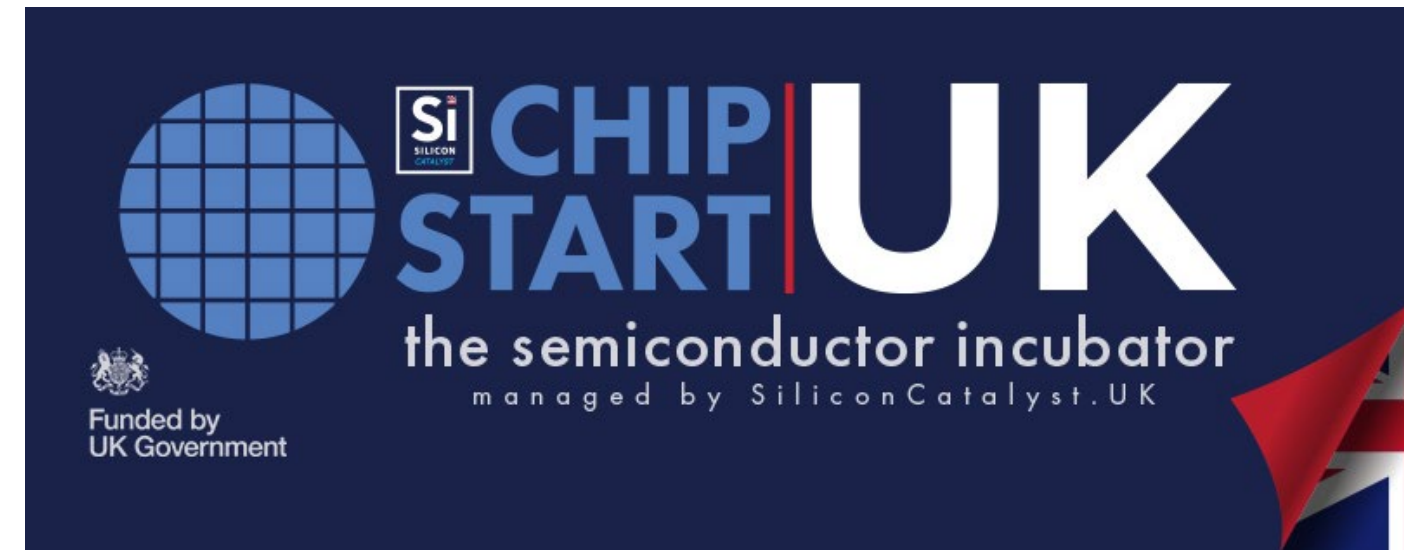
“The Semiconductor Advisory Panel serves as the perfect way for industry and Government to work together closely on this critical industry so that we can deliver on our Semiconductor Strategy.”

In addition to the two co-chairs, the Semiconductor Advisory Panel includes:

Amelia Armour - Partner, Amadeus Capital Partners

Janet Collyer - Senior Independent Director at

“The UK is home to a thriving technology ecosystem



EnSilica, Independent NED at the UK Aerospace Technology, Chair of the Board at Quantum Dice and at Machine Discovery

Prof. John Goodenough - Chair in Microelectronic Systems, University of Sheffield

Richard Grisenthwaite - Executive VP & Chief Architect, Arm

Rae Hyndman - Managing Director, Clas-SiC Wafer Fab

Americo Lemos - CEO, IQE

Dr. Andy Sellars - Strategic Development Director, Compound Semiconductor Applications Catapult

Dr. Eben Upton - CEO, Raspberry Pi

Scott White - Executive Director, Pragmatic

Co-chair Dr Jalal Bagherli said:

“I am thrilled to be a member and co-chair of the upcoming UK Semiconductor panel, which presents a remarkable opportunity to bridge the gap between industrial executives, academia and national government. Each member brings a unique perspective and expertise, making it an ideal platform to collaborate with national government in shaping an effective policy for our industrial sector.”

The panel will meet every two months from now, agreeing key actions for both industry and

government to take to further the sector. While the panel is a small, focused group of leading industry figures, it will engage broadly across the sector and government will continue to speak to a wide range of players across the UK semiconductor industry.

Richard Grisenthwaite, EVP and Chief Architect, Arm, said:

“The UK is home to a thriving technology ecosystem and Arm is proud to have its headquarters in Cambridge, as we continue our work to enhance every walk of life with Arm technology.

“I look forward to serving on the Semiconductor Advisory Panel to ensure the UK has a strong place in the extraordinarily globalised semiconductor industry. We will focus on developing the UK's already considerable strengths, while working with like-minded nations to ensure resilient supply chains.”

The Government has also today announced details of the UK's first semiconductor design incubator, which will give early-stage semiconductor companies in the UK technical and business support they need to bring new products to the market.

The pilot scheme will be run by SiliconCatalyst.UK, an experienced start-up accelerator, and will nurture semiconductor start-ups from across the UK through an extensive nine-month incubator programme.

## SILICON CATALYST ADVISOR PROFILE DR. JALAL BAGHERLI

SiliconCatalyst.UK Advisor Dr. Jalal Bagherli shares some enlightening insights on his storied career.

**We recently sat down with SiliconCatalyst.UK advisor Dr. Jalal Bagherli to discuss his journey in the semiconductor industry.**

**From an early age Dr. Bagherli has been fascinated with how things work, in particular with electronics and miniaturization. His curiosity as a boy had him wondering how a TV works and how a digital clock calculates time and how cameras function.**

This curiosity and search for knowledge led him on a pioneering path to a PhD in chip design in the United Kingdom at a time when IC design firms became a force in the early 1980s, with fabless companies emerging. A true believer that the only constant in life is change, Jalal views every day as an exciting challenge and opportunity to see things differently and perhaps make a difference through the discovery of a better way. Delighted to have chosen a career in semiconductors, he is quick to offer, “I have never gotten bored in this industry.”

The CEO of both the successful semiconductor startup Alphamosaic and the hugely successful global industry leader Dialog Semiconductors, he began his career with two Silicon Catalyst Strategic Partners, namely, Texas Instruments and Sony. Bagherli speaks very highly of his 9 years at TI or ‘Training Institute’ as he and many others have called it. He described his time there as having laid the foundation and appreciation of strong corporate governance and culture. It is with gratitude that he discusses what he learned about project management, customer engagement, and both industry ethics and ethos. His work in both

the UK and France exposed him to an international operating environment. He found the opportunity to engage with people from Europe, Asia and the US to be quite stimulating and unique to the semiconductor industry at the time.

He described his time at Sony to be less top down than TI and more entrepreneurial from a product creation point of view. At Sony he learned the discipline to handle hard-to-manage consumer electronics which have their own unique challenges, rhythm, and culture. A key takeaway was understanding the importance of budget in a consumer spending environment, namely what impact does a new innovation or approach have within the confines of an existing budget vis-a-vis what it is replacing. Whereas TI offered key B2B insights, his time at Sony enlightened him to the decision-making ramifications in a B2C environment. And, of course, he learned the importance of Christmas which put a capital C in Consumer electronics. Sony was management by consensus, management by teams, without having the power of ‘hire and fire’. The understanding of soft power was essential. The collaborative culture was conducive to deploying indirect influences to persuade, inspire, and encourage outcomes. Dr. Bagherli described it as motivational management.

The lessons learned earlier in his career served him well as the first and last CEO of the successful startup Alphamosaic. Though not a founder, he sold the company to Broadcom after only three and a half years. The lessons learned from



**DR. JALAL BAGHERLI**  
SILICONCATALYST.UK  
ADVISOR

## SILICON CATALYST ADVISOR PROFILE DR. JALAL BAGHERLI

A conversation with a SiliconCatalyst.UK Advisor

Alphamosaic included understanding the value of money. The constraints of money in a startup force one to prioritize what is most important at a given moment in time. One dollar in a startup is more valuable than 10 dollars in a big company because you have to be frugal and focus on what really matters. In addition, the Esprit de Corps within a team of startup entrepreneurs fosters an energy, enthusiasm, and dedication founded not only on the technology but on the sense of ownership and being a part of something special. When someone feels they can make a difference in a company, they are more empowered to do so.

My journey as a startup CEO afforded me observations and leadership skills that I brought to my next endeavor at Dialog which was a turnaround story. Dialog was a publicly listed company that was in trouble and had lost its way. My mission there was to find a way to right the ship. Borrowing from my startup experience, I tried to inject energy, inject ownership, and inject enthusiasm back into the company. My goal was to put a focus on what mattered. I looked to set ambitious yet achievable goals for my teams and the company. I made clear what my expectations were then got out of the way and left them to execute. Each team was left to define their own goals which gave them ownership of their outcomes. It was almost a scrum-like management style before scrum was even a thing. My objective was to only intervene when necessary. I didn’t want to take the fun out of their jobs. I believe people should chart their own course by taking responsibility and ownership of a function, project or product. There were no assistant manager titles to make sure managers were more hands on with the function and make better decisions.

At Dialog, I insisted on regular company-wide communication, usually monthly or bi-monthly, worldwide. I would be on every one of those calls and accessible to everyone for any question, without a filter. I believe in full transparency. By being accessible and therefore accountable to anyone in the company, I was walking the walk

I wanted the employees to walk. It turned out to be a good motivator. I think that’s the best way to carry people with you, especially if the company is in trouble. I had no tolerance for either Mañana (I’ll do it later) or politics. I tried reducing layers in order to improve critical change communications to employees.

Something else I can share which may be helpful to those reading this is that early on at Dialog, I tended to overthink things. I went in with the idea that I’d be out in three to five years with everything fixed. Meanwhile, I was there for sixteen years. So clearly, I should have done a lot of things faster. I should have brought better people on faster. I didn’t want to upset the ecosystem, my thought initially was to move gradually, when in fact I should have moved faster. Having said that, there truly are no easy answers.

I’m impressed with the Silicon Catalyst model and believe it was sorely needed in the UK. I am equally impressed with the companies that you are incubating. In fact, I have invested in Saliency Labs and have joined their board. Some advice I can share with startup CEO’s is to believe in your innovation but be humble. You must be willing to listen and seek knowledge and wisdom from those who can help you. You will make yourself a lot more attractive to investors and advisors if you follow this advice.



Dialog brings decades of experience to the rapid development of ICs while providing flexible and dynamic support, world-class innovation and the assurance of dealing with an established business partner.  
[www.dialog-semiconductor.com](http://www.dialog-semiconductor.com)

## SILICON CATALYST ADVISOR INTERVIEW



### Jem Davies, Former VP of Technology at Arm

November 2, 2022 - [Watch the full interview here.](#)

Silicon Catalyst UK Managing Partner Sean Redmond had an opportunity to interview Jem Davies, a Silicon Catalyst Advisor. Jem is an experienced entrepreneurial senior leader, with a successful track record identifying technical trends, spotting commercial disruptions, setting strategy, and building/developing leadership teams to achieve real commercial business growth, acquiring startups to accelerate that growth, when appropriate. He has more than two decades' experience in the semiconductor and IP businesses working closely with the largest technology companies in Asia, US and Europe.

Originally an OS kernel hacker, Jem strayed across into hardware architecture and held various roles at Arm over a long career, including Fellow, VP of technology, setting technology strategy and roadmaps, finally as general manager of two startup businesses he founded/created inside Arm: media processing (producing the world's #1 shipping GPU) and AI/Machine Learning.

Based in Cambridge, UK, Jem holds four patents in the fields of CPU/GPU architecture, memory systems and compression and a degree from the University of Cambridge.

What follows is a brief sampling Sean's conversation with Dave. You can view or listen to the full interview from the Silicon Catalyst website, <https://siliconcatalyst.com/advisor-ecosystem>

#### SR: WHAT GOT YOU STARTED WITH THE SEMICONDUCTOR INDUSTRY, YOUR SCHOOLING AND FIRST JOB?

JD: I never intended actually from the start to get involved in semiconductors. I went to University to read maths. I changed and became a theoretical chemist, which was absolutely useless as a vocational qualification, and I thought I better get a job. And so I ended up in software, moving progressively further and further towards hardware until basically I was a hardware architect. I started working with semiconductors, running a small software consultancy and we were working with Arm. I then joined Arm and stepped into semiconductors full-

time. My job initially was to Port Linux to the first cache coherent multi-processor that Arm was producing and I thought that was a software job.

How little did I understand that actually it was all about fixing the hardware and making sure that the hardware understood that it was there to run software and not the other way around. In my career, I've gotten involved in a number of acquisitions and even more investigations of companies not to be acquired while I was working at Arm. We were looking at buying small startups. And that's actually kind of what I am. I'm a startup guy. I built two businesses inside Arm.

#### SR: WHAT ADVICE WOULD YOU HAVE FOR EARLY-STAGE SEMICONDUCTOR START-UPS?

JD: The advice I would give my younger self would be about communications, about persuading people. Particularly when you're young you think you've got all the answers and you're right and everyone else is wrong. And if they don't understand that you're right, then they're stupid. And actually no, it's standard communications theory, the responsibility is on the transmitter to ensure the message gets across - it's not the responsibility of the receiver and if they don't understand you or they do something stupid because they don't understand you - it's your fault!

And even if you want to be a technical leader, as opposed to a manager, you have to work on those skills. You have to work on understanding people, making sure those people understand you and the message you're trying to get across. Having a really clever invention isn't the same as having a really good business proposition.

One of the things I really enjoy working with Silicon Catalyst is taking these very, very technical startups and say that's really clever, but that's not that's not a business proposition. So what is the problem?

From the customer's perspective, what of their problems will be solved by your clever invention. I don't care whether you call it marketing or you call it technical communication, but you've got to be able to do that. The

very best startups combine that technical cleverness or invention with the ability to clearly communicate your value to the market.

I think that messaging is incredibly important and I'm convinced that communicating what it is you do is incredibly important. I understand that a lot of very technical people are allergic to the word marketing or brand or tagline, but actually the naming of things does matter.

#### SR: WHAT APPLICATION AREAS AND TECHNOLOGIES DO YOU SEE THAT WILL DRIVE THE NEXT BUSINESS GROWTH STAGE FOR THE SEMICONDUCTOR INDUSTRY?

JD: I wouldn't like to say I've got the exact prediction correct as to what the next big thing is, but I've got a framework within which I can see what sort of things are coming. With all due respect for my incredibly clever CPU architect colleagues, they're running out of road. You can only make your general-purpose CPUs so fast, so efficient, so low power, so high performance, you know, you can improve the memory interface. But you know, there's the end of the road is out there.

Today's computing workloads are not generic, they're not all the same thing. And so there are certain workloads, which we see have become worthwhile in building special purpose processes For graphics, obviously, you can't do 3D graphics on a CPU, it would go one frame per fortnight. You just can't do it.

What's interesting now is we're seeing other new workloads that are becoming so prominent, so prevalent that it is now worth getting special purpose processors, especially for machine learning. It's going to be huge and some people predict that you know, 50% of all compute cycles in a few years' time will be spent executing machine learning workloads. And so designing processors dedicated to those special purpose workloads will be key.

What's the next thing? There are some people I've talked to who think that data analytics and graph analytics of results from huge scale data collection activities is an important growth opportunity. The type of computation requires traversing these data structures that graph like data structures is sufficiently different than a general purpose CPU, which doesn't do it terribly well.

Watch Jem Davies speak about Arm Flexible Access (AFA) here on [SiliconCatalyst.com](https://SiliconCatalyst.com).

### JEM DAVIES

Jem is currently a non-executive director and advisor to several startup companies in the UK and US, looking for opportunities to use his expertise to achieve wider impact and success.

An experienced entrepreneurial senior leader, with successful track record identifying technical trends, spotting commercial disruptions, setting strategy, and building/developing leadership teams to achieve real commercial business growth, acquiring startups to accelerate that growth, when appropriate. More than two decades' experience in the semiconductor and IP businesses working closely with the largest technology companies in Asia, US and Europe.

Originally an OS kernel hacker, Jem strayed across into hardware architecture and held various roles at Arm over a long career, including Fellow, VP of technology, setting technology strategy and roadmaps, finally as general manager of two startup businesses he founded/created inside Arm: media processing (producing the world's #1 shipping GPU) and AI/Machine Learning.

Based in Cambridge, UK, Jem holds four patents in the fields of CPU/GPU architecture, memory systems and compression and a degree from the University of Cambridge. He enjoys gliding, diving and fireworks.





## SILICON CATALYST ADVISOR PROFILE PROFESSOR JOHN GOODENOUGH

Sean Redmond, Silicon Catalyst UK Partner, had an opportunity to speak with Professor Goodenough to discuss his current position at University of Sheffield, and his stellar career in the semiconductor industry

Professor John Goodenough is Chair in Microelectronics at Sheffield University. He was previously VP Research Collaboration at Arm and had been with the company for 20 years. He has held a number of executive technology management roles in engineering, design automation M&A and IT Services. Reporting to the CTO at Arm, John's focus was on the external research ecosystem working to both support their activities and accelerate the technology roadmaps at Arm. John has long been a champion of Design Enablement to drive best in class integration and interoperability of Arm's technology and has previously served as Board Director of various Design Automation standards groups. He was principle investigator for AISS, a major collaborative DARPA program which addresses several aspects of rapid turnaround design and deployment methodologies for the secure SoC Device. Dr Goodenough Holds a BSc from Durham University and a PhD in VLSI Architecture from the University of Sheffield.



**JOHN GOODENOUGH, PH.D.**  
DEPARTMENT CHAIR IN  
MICROELECTRONIC SYSTEMS,  
ELECTRONIC AND  
ELECTRICAL ENGINEERING,  
SHEFFIELD UNIVERSITY  
<https://www.sheffield.ac.uk/>

I started my engineering journey by solving puzzles. As a child, I dismantled radios and discovered their secrets. In university, my fascination grew as I explored the intricate system stack. I began programming microcontrollers, igniting my passion for the interplay between code and hardware. This drive eventually led me

to pursue a PhD in VLSI. The rest is as they say 'history'.

**YOU SPENT MOST OF YOUR CAREER WORKING FOR OUR SILICON CATALYST STRATEGIC PARTNER, ARM. WHAT WOULD YOU SAY WERE THE TOP REASONS FOR THEIR GLOBAL SUCCESS?**

Customer needs are the primary focus for Arm, an IP provider that thrives on the success of its customers. Arm's prowess as a business lies in its ability to understand and meet customer needs effectively. Another key strength is their collaborative approach, working harmoniously within the entire ecosystem to achieve mutual benefits. The company's relentless emphasis on its people and culture remains fundamental, even amidst organizational growth. Interestingly, Arm's technologies, though significant, take a backseat to the critical factors that truly shape its success.

**YOU'RE ONE OF THE RARE SEMICONDUCTOR LEADERS THAT STARTED AS A UNIVERSITY LECTURER AND YOU TOOK ON THE CHALLENGE OF STARTING YOUR**

“Running a business is like solving a puzzle where technical obstacles are just the beginning.”

## SILICON CATALYST ADVISOR PROFILE PROFESSOR JOHN GOODENOUGH

Sean Redmond speaks with Professor John Goodenough

**OWN BUSINESS, INFINITE DESIGNS. WHAT ADVICE WOULD YOU GIVE TO UNIVERSITY RESEARCHERS AND LECTURERS WHO ARE THINKING ABOUT STARTING THEIR OWN COMPANY?**

Embrace the challenge! Running a business is like solving a puzzle where technical obstacles are just the beginning. You'll also navigate the intricate tasks of building your ecosystem, presenting products, and managing finances. Fearlessness comes from a curious and open mindset, welcoming every new challenge. Embrace the unpredictable journey, for it rarely unfolds as expected. Stay open to experiences, learn from them, and keep moving forward with unwavering determination.

**WHAT IS IT THAT DREW YOU TO JOIN AS A SILICON CATALYST ADVISOR?**

The essence lies in the power of the Silicon Catalyst ecosystem and network. Transitioning from the States to the UK, it becomes a gateway to tap into that very ecosystem. Within it, you

find a cohort of advisors embodying the entire spectrum of the semiconductor world. Accessing these networks is like discovering a remarkable shortcut. Picture yourself entering a room where someone can answer any question about the past 50 years of the semiconductor industry, encompassing all technologies, business ideas, models, and even learning from past mistakes. Personally, this is immensely valuable as I still harbor curiosity. Lately, I've been diving deep into silicon carbide and gallium nitride, engaging in conversations with experts in the UK's compound semiconductors realm. Regardless of your starting point, you gain access to individuals with lived experiences, comprehending all facets of the Silicon Catalyst ecosystem. This collective strength not only encompasses technologies but also encompasses insights on running startups, sales strategies, ecosystem-building, market share acquisition, and fostering collaborations. It's a network characterized by an open culture, where advisors are candid, allowing for fruitful challenges. Engaging with mentors who provide genuine insights into reality is truly rewarding.

**AFTER WORKING WITH ARM, THE WORLD'S LARGEST AND MOST INFLUENTIAL SILICON DESIGN IP COMPANY, WHAT DO YOU SEE AS THE MOST EXCITING THINGS COMING TO THE INDUSTRY?**

While the demise of Moore's Law is not imminent, there's an intriguing prospect of how to adapt when Dennard scaling eventually fades away and feature sizes become uncertain in the next 5-10-15 years. It's not just about the speed in the traditional Intel sense; instead, we'll modify instructions to meet the performance demands of new applications, subsequently altering the process technology. The path we're heading towards involves integrating silicon with compound devices, each possessing unique characteristics like high-power switching or optical sensing capabilities. This era of heterogeneity presents a fresh canvas for exploration. Architecturally, we can ponder techniques to optimize device size, leveraging the diverse range of materials available to us today.



John Goodenough

“Embrace the unpredictable journey, for it rarely unfolds as expected.”

## PRODUCT-MARKET FIT STEVE BLANK

Steve Blank Adjunct Professor, Stanford University

Whether you're building new silicon, new design tools, or services here are the nine flawed assumptions founders make.

### 1. ASSUMING YOU KNOW WHAT THE CUSTOMER WANTS

First and deadliest of all is a founder's unwavering belief that they understand what customers need, who the customers will be, and how to sell it to them. Any dispassionate observer would recognize that on Day One, a start-up has no customers, and unless the founder is a true domain expert, he or she can only guess about the customer, problem, and business model. On Day One, a start-up is a faith-based initiative built on guesses.

To succeed, founders need to turn these guesses into facts as soon as possible by getting out of the building, asking customers if the hypotheses are correct, and quickly changing those that are wrong.

### 2. THE "I KNOW WHAT FEATURES TO BUILD" FLAW

The second flawed assumption is implicitly driven by the first. Founders, presuming they know their customers, assume they know all the features customers need.

These founders specify, design, and build a fully featured product using classic product development methods without ever leaving their building. Yet without direct and continuous customer contact, it's unknown whether the features will hold any appeal to customers.

### 3. FOCUSING ON THE LAUNCH DATE

Traditionally, engineering, sales, and marketing have all focused on the immovable launch date. Marketing tries to pick an "event" (trade show, conference, blog, etc.) where they can "launch" the product. Executives look at that date and the calendar, working backward to ignite fireworks on the day the product is launched. Neither management nor investors tolerate "wrong turns" that result in delays.

The product launch and first customer ship dates are merely the dates when a product development team thinks the product's first release is "finished." It doesn't mean the company understands its customers or how to market or sell to them, yet in almost every start-up, ready or not, departmental clocks are set irrevocably to

"first customer ship." Even worse, a start-up's investors are managing their financial expectations by this date as well.

### 4. EMPHASIZING EXECUTION INSTEAD OF TESTING, LEARNING, AND ITERATION

Established companies execute business models where customers, problems, and necessary product features are all known; start-ups, on the other hand, need to operate in a "search" mode as they test and prove every one of their initial hypotheses.

They learn from the results of each test, refine the hypothesis, and test again—all in search of a repeatable, scalable, and profitable business model. In practice, start-ups begin with a set of initial guesses, most of which will end up being wrong. Therefore, focusing on execution and delivering a product or service based on those initial, untested hypotheses is a going-out-of-business strategy.

### 5. WRITING A BUSINESS PLAN THAT DOESN'T ALLOW FOR TRIAL AND ERROR

Traditional business plans and product development models have one great advantage: They provide boards and founders an unambiguous path with clearly defined milestones the board presumes will be achieved. Financial progress is tracked using metrics like income statement, balance sheet, and cash flow. The problem is, none of these metrics are very useful because they don't track progress against your start-up's only goal: to find a repeatable and scalable business model.

### 6. CONFUSING TRADITIONAL JOB TITLES WITH A STARTUP'S NEEDS

Most startups simply borrow job titles from established companies. But remember, these are jobs in an organization that's executing a known business model. The term "Sales" at an existing company refers to a team that repeatedly sells a known product to a well-understood group of customers with standard presentations, prices, terms, and conditions. Start-ups by definition have few, if any, of these. In fact, they're out searching for them!

The demands of customer discovery require people who are comfortable with change, chaos, and learning from failure and are at ease working in risky, unstable situations without a roadmap.

### 7. EXECUTING ON A SALES AND MARKETING PLAN

Hiring VPs and execs with the right titles but the wrong skills leads to further trouble as high-powered sales and marketing people arrive on the payroll to execute the "plan." Executives and board members accustomed to measurable signs of progress will focus on these execution activities because this is what they know how to do (and what they believe they were hired to do). Of course, in established companies with known customers and markets, this focus makes sense.

And even in some start-ups in "existing markets," where customers and markets are known, it might work. But in a majority of startups, measuring progress against a product launch or revenue plan is simply false progress, since it transpires in a vacuum absent real customer feedback and rife with assumptions that might be wrong.

### 8. PREMATURELY SCALING YOUR COMPANY BASED ON A PRESUMPTION OF SUCCESS

The business plan, its revenue forecast, and the product introduction model assume that every step a start-up takes proceeds flawlessly and smoothly to the next.

The model leaves little room for error, learning, iteration, or customer feedback.

Even the most experienced executives are pressured to hire and staff per the plan regardless of progress. This leads to the next startup disaster: premature scaling.

### 9. MANAGEMENT BY CRISIS, WHICH LEADS TO A DEATH SPIRAL

The consequences of most start-up mistakes begin to show by the time of first customer ship, when sales aren't happening according to "the plan." Shortly thereafter, the sales VP is probably terminated as part of the "solution."

A new sales VP is hired and quickly concludes that the company just didn't understand its customers or how to sell them. Since the new sales VP was hired to "fix" sales, the marketing department must now respond to a sales manager who believes that whatever was created earlier in the company was wrong. (After all, it got the old VP fired, right?)

Here's the real problem: No business plan survives first contact with customers. The assumptions in a business plan are simply a series of untested hypotheses. When real results come in, the smart startups pivot or change their business model based on the results. It's not a crisis, it's part of the road to success.

Steve Blank is an Adjunct Professor at Stanford University



STEVE BLANK

ADJUNCT PROFESSOR, STANFORD UNIVERSITY

and a Senior Innovation Fellow at Columbia Business School. He founded or was an early employee of eight startups in supercomputers, enterprise software, high performance graphics, military intelligence and two microprocessor companies; Zilog and MIPS.

Blank is credited with creating the current generation of modern innovation and entrepreneurship methods. His book *The Four Steps to the Epiphany* and his Customer Development methodology was the foundation of the Lean Startup movement. His *Lean LaunchPad* curriculum developed at Stanford was adopted by the National Science Foundation as I-Corps - designed to support the commercialization of "deep technologies," - those revolving around fundamental discoveries in science and engineering.

I-Corps teaches principal investigators how to reduce the time and risk associated with translating promising ideas and technologies from the laboratory to the marketplace. I-Corps uses Blank's curriculum for experiential learning of customer and industry discovery, coupled with first-hand investigation of industrial processes, to quickly assess the translational potential of inventions. The goal is to bridge the skill and knowledge gap associated with the transformation of basic research into "deep technology ventures." NSF I-Corps is now taught in 98 colleges and universities.

Blank tailored the I-Corps curriculum for life sciences for the National Institute of Health where it's now taught in the National Cancer Institute and developed and taught a version for Imperial College in synthetic biology. He also co-created a version for the National Security Agency now taught throughout the Intelligence Community.

He has received numerous awards, authored three books, and has written for several publications including the *Wall Street Journal*, *Harvard Business Review*, *Forbes*, *Inc.*, *IEEE Spectrum*, *NikkeiBP*, *War On the Rocks* and the *People's Daily*.

Blank has given six commencement speeches. National Public Radio (NPR) selected the Philadelphia University speech as one of the 300 best commencement speeches in the last 300 years.

## INDUSTRY NEWS

**MOSHE GAVRIELOV: PREVIOUSLY CEO AT XILINX, VERISITY AND EVP AT CADENCE, CURRENTLY A MEMBER OF THE TSMC BOARD OF DIRECTORS**

### Sean Redmond's interview with Moshe Gavrielov

**SEAN REDMOND**

I'm delighted to introduce Moshe Gavrielov, the ex-CEO of Xilinx, current board director of TSMC, and a very good friend to the UK semiconductor industry. Tell us about your connection with the UK Moshe and why you like spending time here?

**MOSHE GAVRIELOV**

I was born in Israel, but I actually grew up in London and I spent several formative years here when I was a child in London. I just always loved going back and walking around London. Then following that, I actually had an opportunity to run LSI logic's international business based out of the UK. The European headquarters was moved to Bracknell. So I spent two years managing the European business and then it expanded to all of the international business out of Bracknell. So I spent another two years of my life in the UK. So between the seven early years as a kid and two years, much, much later as an adult, I've always liked coming to the UK. I have a lot of friends in the UK. I have tremendous admiration for the engineering capabilities in the UK, which truthfully, I think have been underutilized and under exploited, over the years. So for me, there's just a very warm spot in my heart for everything from the UK.

**SEAN:** Moshe, you've been the CEO of a fabulously successful startup, Verisity, that was IPO of the year on Nasdaq in 2001. What advice would you give to new semiconductor startup CEOs that you wish you knew



**SEAN REDMOND**  
FOUNDER & CEO,  
VERTIZAN  
MANAGING PARTNER,  
SILICONCATALYST.UK

when you started taking on that role as the CEO of Verisity?

**MOSHE:** Well that was indeed a unique opportunity. It was first and foremost a great set of people. And I would say, you need to make sure in particular in a startup, that you have people you want to work with, right? Because startups tend to be so intense and they tend to have small teams where people perform several functions. There's no sort of infrastructure. I would say, first and foremost, make sure that you like the people you're working with, because you will spend a lot of time with them.

And then, you know, there's always a question. How do you drive the company? Do you drive it towards an exit, which is an acquisition, or do you try to build an independent company? And, I believe, that

the proper approach is if you do things with the intention of it being a well-run significant company that can grow and remain independent, then you have more options.

And then if, and when, as most startups end up, they do get acquired. We were fortunate at Verisity. We went public in 2001, which is not an easy time to go public. And then we were public for four years before we were acquired by a much larger player. But I would say, try to think about the medium and the long-term and use that as the driver of what you're trying to do. And don't just do it based on short-term thinking, because I think that if you compromise and just try to get things done for the short term, you really are restricting your options going forward. And it's worth keeping that in mind when you're running even a small company to keep the medium and long-term in mind in terms of your goals and expectations.

**SEAN:** Excellent. Thank you, Moshe. Very few startup CEOs go on to run one of the largest semiconductor companies in the world. And you successfully made that transition. What's your view on taking risks when you're starting new projects? Clearly startups are by their very nature, new, innovative, quite often doing things that have never been done before. And so in making decisions about taking

“Keep your eye on the differentiation, make sure that you exploit it and you're very aggressive at driving it.”

technology risk or market risk to develop products for yet to be defined markets, what's your take on that very difficult decision in terms of risk-taking.

**MOSHE:** You know, as you point out very correctly, startups are risky and that's okay. They're also a lot of fun. There's a lot more freedom when you're running a startup because you don't have tremendously difficult, big company issues. You can make decisions very quickly and you can pivot quite quickly. I would say that with the issue of risk, I think the most important thing to do is to have a clear understanding of what your core differentiation is. And as long as you have a clear understanding of what you have, which is different, either in terms of the technology and the markets and relentlessly drive to exploit that, then you're more likely to be successful. And I would say that anything which really is not differentiated, or maybe is just focused on reaching a lower price point, but without a clear technology or market differentiation, it's very risky.

And the reason is that those price points are not defined by you. They are defined by what the competition is prepared to sort of accept, right? So you can sort of say, okay, you know, mine will cost half as much. Well, it could cost half as much as what your competitor is selling it for today, but if they want to protect their market, which they typically will, and you're a small player, then just sort of reducing the price, beyond what you believe they can do is not something you can control. And so keep your eye on the differentiation, make sure that you exploit it and you're very aggressive at driving it as profoundly as you can, because then I believe you'll be more successful in delivering success, going forward.

**SEAN:** Excellent advice Moshe for new CEOs out there. What's the hardest thing they're going to have to face as a CEO?

**MOSHE:** Well, this is a cliché, but it's actually true. The CEO role is a very lonely one and in the startup world it's even lonelier. Because there's so many things that you need to do as a CEO and there's not the broad support structure. My advice is to make sure that you have, and I don't know if mentor is the right word, but you have someone, who's not part of your team, but who you can be open with and who will listen to you and hopefully has the experience. Who will be able to share their thoughts based on what you're presenting to them. It's something I actually am trying to do now, since I'm retired, and I'm not in any active operational roles. I like to do board roles and primarily make myself available to the CEOs and actually to some of the staff. Sharing my thoughts with them without trying to run the companies for them, which I have no interest in doing, I think is one of the biggest benefits that I provide. And I personally had that option where there was someone who was outside our industry. I could always call and he was always happy to hear what my challenges were and to share his opinions. That neutral person who's really there as a sounding board and is a constructive sounding board is invaluable. And I would say that for CEO startups, if you can find someone like that, normally they don't have to be friends, but normally there's sort of a respect that you have to that person and that person has towards you, is very helpful and was very helpful to me.

[www.tsmc.com](http://www.tsmc.com)



**MOSHE GAVRIELOV**  
TSMC  
INDEPENDENT DIRECTOR  
MEMBER,  
AUDIT COMMITTEE  
MEMBER,  
COMPENSATION  
COMMITTEE

Mr. Gavrielov served as President and CEO of Xilinx, Inc. from January 2008 to January 2018 and as a director of Xilinx, Inc. from February 2008 to January 2018. Prior to that, he served at Cadence Design Systems, Inc. as Executive Vice President and General Manager of the Verification Division from April 2005 to November 2007, and CEO of Verisity, Ltd. from March 1998 to April 2005. He also served at a variety of executive management positions in LSI Logic Corp. for nearly 10 years, and engineering and engineering management positions in National Semiconductor Corporation and Digital Equipment Corporation. Currently, Mr. Gavrielov is the Executive Chairman of Wind River Systems, Inc. in U.S. (a nonpublic company) and a director of Foretellix in Israel (a nonpublic company). Mr. Gavrielov holds a bachelor degree in electrical engineering and a master degree in computer science from Technion—Israel Institute of Technology.

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## Forming, Storming, Norming and Performing

A Silicon Catalyst event hosted by Arm in Cambridge

With the enthusiasm for semiconductor startups firmly re-established in the UK, we conceived a “Forming, Storming, Norming and Performing” theme for a series of events to tease out those founders that have gone before to share their learnings with new startup teams. The event was kindly hosted by Arm (a Silicon Catalyst strategic partner and In Kind Partner) at the address of legends, 110 Fulbourn Road, Cambridge. We had one of SiliconCatalyst.UK advisors, the great Malcolm Penn, take us through the concept that no company is an island when testing their value proposition.

We then kicked off with Phillip Burr describing the hugely generous Arm Flexible Access program that releases the potential of semiconductor startup designers to get market leading design IP. Two legends of our UK semiconductor startups Phil O’Donovan co-founder CSR Plc and Jerry Loraine talked about “how bad things happen to good people” with stories about patent trolls and go to market challenges. This led naturally into “the importance of the team” with a single person invention idea from Bruno Johnson. Where Cascoda invented a radio architecture to increase range by 3x for Thread Group #iotdevices and is now shipping Arm based products

into #smartcities #smartbuildings all around the world. This section concluded with a compelling presentation from the illustrious Jim Nicholas walking us through the inventive team idea from Uniphy Ltd

The last session before the break had the wonderful Vaysh Kewada from Saliency Labs (a Silicon Catalyst portfolio company) share her deep insights into “creating relentlessly repeatable processes from day 1” of your startup journey. Followed by a hugely insightful deep dive by Pete Hughes the foremost semiconductor product operations executive in the UK on how to ship high volume semiconductor products with the level of quality that your market leading customers will demand. Back from the break where the Arm catering team laid on a spread that would not look out of place at the Ritz, we leapt into “what problem are you solving?” Patrick Camilleri shared his learnings on how to build semiconductor design IP combined SaaS product offerings and then Gary Spittle founder of Sonical Inc (A Silicon Catalyst portfolio company) projected the huge opportunity in their end to end system play to command the compute in the ear application space. We concluded the presentations with the eternal “how much money



## BUILDING ON SUCCESS

Following the launch of SiliconCatalyst.UK in summer '21 we have focused on increasing awareness and understanding of the semiconductor community here to the benefits of our startup accelerator.

To connect the UK semiconductor startup community, we continued to build on the success



of our physical launch event at the historic Bletchley Park, home of Alan Turing's code breakers. We hosted a leadership dinner at the 5-star Whatley Manor Cotswold resort. Our startup CEO's, including Vaysh Kewada of Saliency Labs and Huw Davies of Trameto, were engaged with great insights from industry luminaries such as Jalal Bagherli, ex-CEO Dialog Semiconductor, Ray Bingham, Executive Chairman of Imagination Technologies and Owen Metters of Foresight Williams one of the leading Semiconductor early-stage VC's.

We gathered again at the Annual General Meeting of our UK



partner Techworks NMI, where we hosted a table for our Portfolio Companies, Advisors, Strategic Partners and In Kind Partners. Sean Redmond contributed to a lively panel discussion, providing insights on how Silicon Catalyst helps semiconductor startup to de-risk access to foundry, design automation, IP and investment.

will you need?” The marvellous Tony Milbourn who leads u-blox corporate venturing shared in detail how they look for the secret sauce of semiconductor startup success. Then Owen Metters Foresight Group Williams, the leading semiconductor VC investor in the UK took us through three compelling case studies. The final panel session led us into a lively debate into what we need to do to make UK Semiconductor great again and make sure we create an open and inclusive industry where everybody can thrive.

The day was topped off with a VIP wine tasting at Hotel Du Vin in Cambridge to thank all those that contributed to the hugely successful event. The guests were treated to our very own Lance Bell telling the fascinating story of a horse called “Never Say Die” which has been used for the branding of the very first UK bourbon. Amongst the wines in the “bake-off” between American and Italian red wines was Castello Redmond, the organic red made by our UK managing partner Sean.



Silicon Catalyst continued to build mutual respect and trust with the UK government team working on Semiconductor policy interventions. We accompanied the UK government team over to the Tyndall National Institute in Ireland to help demonstrate the art of the possible with respect to national semiconductor research institutes. We met with the Rt hon Chris Philp, the minister of technology twice and hosted meetings with both Jodi Shelton, CEO of GSA and Mark Edelstone from Morgan Stanley to help provide a global perspective to their semiconductor deep dive. will you need?” The marvellous Tony Milbourn who leads u-blox corporate venturing shared in detail how they look for the secret sauce of semiconductor startup success. Then Owen Metters Foresight Group Williams, the leading semiconductor VC investor in the UK took us through three

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## Forming, Storming, Norming and Performing

A Silicon Catalyst event hosted at Heriot-Watt University in Edinburgh

Silicon Catalyst and Heriot-Watt University GRID delivered the second in the series of the forming storming norming and then performing of UK semiconductor startup companies in Edinburgh yesterday to a sold-out event!

These events have been conceived to help new semiconductor founders learn from the legends of our UK semiconductor industry.

Steve McLaughlin kicked us off with a wonderful insight into the strengths of Heriot-Watt University semiconductor research, entrepreneurship and startup commercialisation

The legend Jed Hurwitz Fellow from Analog Devices took us through how bad things “nearly” happen to good people with a deep insight into how he achieved three successful semiconductor start-up exits. Just fantastic.

Then it was all about the team from a very thought provoking Keith Muir Founder and CEO of the brilliant Cytomos backed up by the gregarious Richard Ord from hot new startup Quantum Power Transformation Ltd explaining how their tiny packed revolution in power drive semiconductors is born from years of ingenuity and unique experiences gained by its founder Rob Gwynne

After a well received break of refreshments, with opportunity to see our exhibitors Synopsys Inc., Imagination Technologies, 360WORK, IC Resources, TechWorks, NMI, and IoTSF, we were given a great



introduction to the hugely generous Arm University and Flexible Access program by the very knowledgeable Andrew Pickard and Nivetha Sundararajan

We then dived into “What problem are you solving” with the legend Donald McClymont who with the spectacular indie Semiconductor has achieved the holy grail of semiconductor startups by floating on Nasdaq. Wow! This talk makes the hairs on the back of your neck stand up on end. Don't miss the video.

Our Silicon Catalyst advisor and In Kind Partner Asen Asenov stormed through how he performed with perfection to create the world leading GSS ltd as a part-time CEO whilst still working as professor University of Glasgow He was followed by the fascinating technology from Brian Gerardot CEO of Atomic Architects on the Heriot-Watt University campus that has the potential to transform feature rich semiconductor manufacturing

We concluded the presentations with the legend Pete Hutton Chairman of our In Kind Partner Agile Analog and Cambridge GaN Devices Ltd providing the gold-dust of advice for raising semiconductor startup funding from Angel or VC investors backed up by an early stage and very exciting Heriot-Watt University semiconductor startup @Infinct and the passionate Samuel Rotenberg delivering the first hybrid flat panel antenna for broadband satellite technology

A huge thank you to all those that attended, contributed and most importantly not forgetting the hard work from Leanne Gunn and the fantastic team at Heriot-Watt University GRID. Great to see David Richardson the instigator of our fruitful collaboration with Heriot-Watt University to help create more exciting semiconductor startups in Scotland.

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## APPLICATIONS NOW BEING ACCEPTED

- **In-Kind Partners** (TSMC, Synopsys, ARM, ST, MathWorks and over 50 more) – provide each startup several millions of dollars’ worth of goods and services including EDA tools, IP, PDKs, prototypes, design and test services, packaging and business solutions.
- **Strategic Partners** (including TI, Soitec, Bosch, Cirrus Logic, Arm, ST, Sony, EMD Electronics and NXP) – participate in the selection process and actively look for opportunities to partner with our startups.
- **Investors** – a large group of over 300 VCs, Angels, Angel groups, Corporate VCs, and Family Offices fund each journey. Silicon Catalyst Angels, created from our ecosystem, also funds our companies.
- **Advisors** – a valuable network of over 200 industry experts that we match to the specific needs of each startup.
- **Universities, Industry Organizations, Accelerators, and Government Agencies** – We nurture dozens of key relationships for the benefit of our portfolio companies. Our companies have received over \$100M in grants.

**THE GOAL: TO MAKE THE UK AN EPICENTER OF SEMICONDUCTOR START-UP INNOVATION**



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## Fabless Companies Can Expect to Regain Leverage as Capacity Grows

At Silicon Catalyst semiconductor startup event at Williams Advanced Engineering, ex-Dialog CEO says good times ahead for fabless companies.

Nitin Dahad | Editor-in-Chief | Correspondent | EE Times, EE Times Europe

The next few years could be a good period for fabless semiconductor companies, especially with the expected growth in fab capacity meaning fabs will need to fill their production lines. That's the view of seasoned electronics industry executive Jalal Bagherli, speaking at this week's Silicon Catalyst semiconductor startup event at Williams Advanced Engineering in the U.K.

Bagherli, previously CEO of Dialog Semiconductor and now investor and board member at various companies, outlined the trends impacting the semiconductor industry, which center around four key areas: geopolitics, Covid-19, climate change, and the semiconductor down cycle. He said the various chips acts around the world are likely to result in over-capacity in the near future. As a result of this and the coming down cycle, he commented, "This means the fabless business model regains leverage. They [the fabs] will be desperate for your business, and silicon cost will go down."

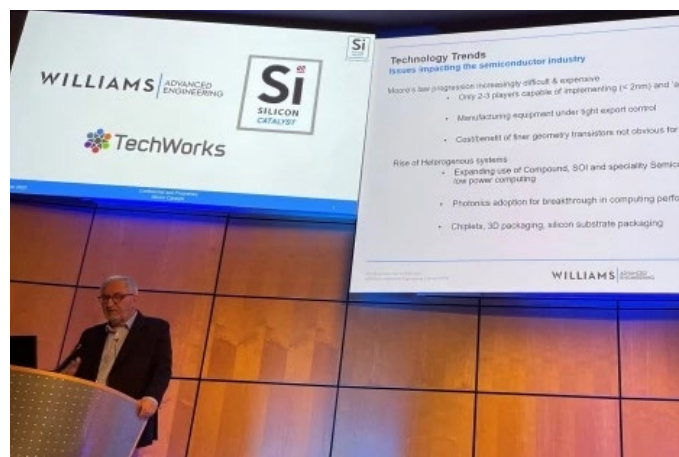
Since selling Dialog Semiconductor, Bagherli has been a prolific 'commentator' on key events and trends in the semiconductor industry. In addition to the geopolitical aspect of how the industry is being impacted, in his talk he offered his perspectives about changing technology trends and business models.

### JALAL TECH TRENDS

Jalal Bagherli highlights some of the key technology trends impacting the semiconductor industry. (Image: Nitin Dahad)

Since the focus of the event was on startups, he also offered his advice to startups:

- If you are fundraising, close as soon as possible and raise as much as you can – at least for a runway of 18 months before next funding round



Jalal Bagherli highlights some of the key technology trends impacting the semiconductor industry. (Images: Nitin Dahad)

- Stay away from 'bleeding edge' digital products – differentiate away from this to have a higher chance of success with less funding
- Focus on customer design-wins that will help create a demand pipeline for the next upturn which could be at least nine months away
- Look at opportunities created by strategic insourcing by system houses – as companies bring chip design in house, they may not have all the expertise needed which creates custom opportunities for niche and mixed signal products to complement their own processors.

Bagherli is currently co-chair at Williams Advanced Engineering (WAE), an adviser to Silicon Catalyst in the U.K., chair of ATE test hardware firm PTSL (who just this week acquired Dallas, Texas-based ThinkMEMS and also last month closed a \$30 million investment from Tikehau Capital), and an investor in Saliency Labs. The WAE grounds, with its Formula 1 racing history, provided the backdrop to this latest in Silicon Catalyst's

series of "Forming, storming, norming & performing of semiconductor startups" events (the last one was held at Arm headquarters in Cambridge, U.K.).

### IT TAKES TEAMWORK TO GET A NEW CHIP TO MARKET

The Silicon Catalyst event included some fascinating insight into Williams Advanced Engineering's work on electrification and battery management, followed by presentations from startups Oxford RF Solutions, Saliency Labs, and QPT.

### OXFORD RF SOLUTIONS

Kashiff Siddiq, founder & CEO of Oxford RF Solutions, talked about his startup's next generation ADAS sensors, which could potentially reduce the number of sensors in the car.

### SALIENCY LABS

Vaysh Kewada, co-founder & CEO of Saliency Labs, gives an update on the company's photonic solution for AI inference.

We also heard the journey of PTSL, from kitchen worktop with no debt or equity and just £4k of founders' capital, to finally raising external \$30 million of funding this year for next phase growth.

### PTSL

Jordan Mackellar, founder & CEO of Probe Test Solutions (PTSL), talked about his startup journey, including the use of a vacuum cleaner providing suction for the wafer on the kitchen top for its first test rig.

In addition, the fund manager for WAE's technology investment group, Foresight, also highlighted its work with deep tech startups, with which it gets involved at seed funding stage.

### JOE JONES - WILLIAMS ADVANCED ENGINEERING

Joe Jones, product manager for battery technologies at Williams Advanced Engineering, delivered a fascinating



Kashiff Siddiq, founder & CEO of Oxford RF Solutions

insight to the work on battery management, battery intelligence and battery digital twins that is helping the path to electrification in many industries.

The event also presented the importance of the ecosystem and teamwork in getting a chip to market. Raspberry Pi's chief operating officer, James Adams, talked about the work involved in developing its own microcontroller (MCU), the RP2040. He said, "Making chips is hard," as he described how it took teamwork together with Arm and imec and three years to get from design to end product.

### RASPBERRY PI MAKING CHIPS IS HARD

James Adams of Raspberry Pi talked about their journey to getting their own MCU to market, from design to production volume.

He said, "We had a great bootstrap with Arm flexible access and imec. It's been a team effort." Presenting for Arm's involvement in the development, Gabriella Giuffrida, Arm's senior business manager for the flexible access program, said that doing the technology is "incredibly expensive" for a startup, so minimizing risk and providing access to the huge Arm ecosystem was important.

### ARM'S FLEXIBLE ACCESS OVERVIEW

Arm's flexible access program starts free, and fees are introduced gradually as a startup goes through its funding stages.

Imec's ASIC design manager, Paul Ovington, talked about its role in helping Raspberry Pi get its MCU to market through its Imec.IC-Link unit. He said, "We help fabless semiconductor companies get their product to market." For Raspberry Pi, they helped with the project management, packaging, test and qualification, tape-out support, and rapid production ramp.



Vaysh Kewada, co-founder & CEO of Saliency Labs



Jordan Mackellar, founder & CEO of Probe Test Solutions (PTSL) (Images: Nitin Dahad)



Joe Jones, Williams Advanced Engineering

**JAMES ADAMS HIGHLIGHTED THE KEY LEARNINGS FROM THEIR EXPERIENCE IN GETTING THE RP2040 OUT. HE SUMMARIZED IT AS FOLLOWS:**

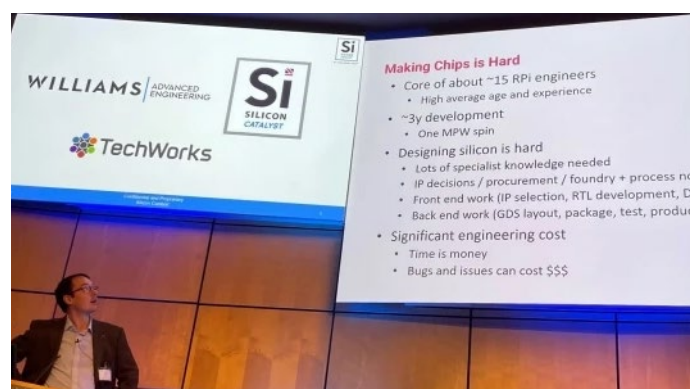
- Hiring in the right experience is important – both internal and external
- Leverage external experience, especially in navigating chip design complexities
- Leverage proven external IP, making sure not to reinvent the wheel but focus on your own unique selling point
- Build the virtual team that you need

**SERVING THE SILICON RENAISSANCE**

Established first in 2015 in the U.S. by Rick Lazansky, Mike Noonan, Dan Armbrust, and Tarun Verma, Silicon Catalyst

says it is the world's only accelerator focused exclusively on accelerating semiconductor startups – including photonics, IP, MEMS, sensors, materials, and life science. Its model is providing support to startups through a network of in-kind and strategic partners to help dramatically reduce the cost and complexity of development. Silicon Catalyst supplies startups with a path to design tools, silicon devices, networking, access to funding, banking and marketing acumen to successfully launch and grow their companies' novel technology solutions.

As Richard Curtin, managing partner at Silicon Catalyst in the U.S., reminded me on a call this week, "There is a silicon renaissance", and he added that we should remind ourselves that semiconductors are the oxygen that allows software to breathe: a good reason for an accelerator focused on silicon. The U.K. Silicon Catalyst chapter was launched last year with Sean Redmond as its managing partner.



James Adams Raspberry Pi



Arm's Flexible Access Program (Image: Nitin Dahad Data source: Arm presentation at Silicon Catalyst)

**NITIN DAHAD**

Nitin Dahad is a Editor-in-Chief of embedded.com, and a correspondent for EE Times, and EE Times Europe. Since starting his career in the electronics industry in 1985, he's had many different roles: from engineer to journalist, and from entrepreneur to startup mentor and government advisor. He was part of the startup team that launched 32-bit microprocessor company ARC International in the US in the late 1990s and took it public, and co-founder of The Chilli, which influenced much of the tech startup scene in the early 2000s. He's also worked with many of the big names - including National Semiconductor, GEC Plessey Semiconductors, Dialog Semiconductor and Marconi Instruments.

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**Forming, Storming, Norming and Performing**  
A Silicon Catalyst event hosted by Williams Advanced Engineering

Silicon Catalyst, Williams Advanced Engineering and Techworks delivered the third in the series of our forming, storming, norming and then performing of UK semiconductor startup companies at the legendary Williams Formula 1 conference centre.

These events have been conceived to help new semiconductor founders learn from those experienced founders who have gone before. To share their learnings, both from the good things that happened and the bad. Deep tech semiconductor startups set themselves apart from other companies by the high level of technology risk they take on. These events help to amplify the benefits of the Silicon Catalyst ecosystem to reduce risk at each step of a semiconductor startups path to global success.

The opening address of the event was delivered by the CEO of Williams Advanced Engineering, Craig Wilson. He provided a fascinating insight into their world of high-performance automotive engineering and why semiconductors are at the bed rock of each improvement they make to accelerate the electrification of vehicles at ever reducing amounts of energy.

One of our most prominent UK Silicon Catalyst advisors, Dr Jalal Bagherli, presented his latest thinking on how to navigate our changing semiconductor world. As the hyperscalers increasingly underpin their technology stacks on semiconductor innovation and feed their need to own all the value they deliver to their customers, the drivers for semiconductor demand have radically changed. Jalal has witnessed

this first hand as CEO of Dialog Semiconductors, where he expertly handled the opportunities and the threats that these new forces create.

Leaders from Williams Advanced Engineering team then took to the stage to share their road to electrification with deep dive insights into battery intelligence and the application of new innovations in power semiconductors. The need to drink from the fire hydrant of new semiconductor innovation shone through from Rob Millar, Tim Engstrom and Shaun Dawson all embracing the early adopter enthusiasm that used to be non-existent in the automotive industry.

Then it was all about the team from our Silicon Catalyst strategic partner Arm. Neil Parris, director for Partner success at Arm, along with one of UK's most successful new deep tech companies, Raspberry Pi and our In-Kind Partner Imec shared how the Arm Flexible Access program was instrumental in helping Raspberry Pi bring their latest world beating small compute platform to market through Imec's IC.link route to foundry.

After a well-received tea break and a tantalising glimpse of the history of the Williams Formula 1 racing cars we were back for what problem are you solving? It was the opportunity for two high class UK based semiconductor startups took to the stage. Firstly, Dr Kashiff Siddiq, the founder and CEO of Oxford RF explained how their 360-degree automotive radar is reducing the cost of detection in autonomous driving. Then our very own Portfolio Company CEO, Vaysh Kewada of Saliency Labs

projected the accelerated benefits of AI compute at the speed of light with their new hybrid approach to deliver on the insatiable demand from high performance engineering for more and more compute.

We concluded with an insight into how much money will semiconductor startups need? These talks covered three very diverse approaches to funding their paths to success. Jordan Mackellar, founder and CEO of Probe Test Solutions in the UK, shared his remarkable story of bootstrapping his business for more than a decade to a successful global scaling business. At which point he attracted nearly \$40M of Private Equity backing to accelerate this global scaling to help take market leadership. The chair of our newest Silicon Catalyst UK Portfolio Company, QPT presented his learning from raising \$1M of EIS Angel funding using an advanced subscription agreement shortly after being accepted into our accelerator. No funding story would be complete without our Venture Capital partners and Chris Wiles of the Foresight group did not disappoint. They have been one of the most active VC investors in UK semiconductor companies and clearly have the vision to help our sector flourish.

A huge thank you to all those that attended, contributed and most importantly Dr Jalal Bagherli, without whom this event would never have happened. Going shoulder to shoulder with Williams Advanced Engineering and our UK partner Techworks to put on this wonderful event to share with the leaders of the UK semiconductor industry has been an absolute pleasure.



A big thank you to our Silicon Catalyst In-Kind Partner, Imagination Technologies, for hosting and partnering with us on Thursday March 30th for a unique UK based event

**“Semiconductors Question Time”**



We gathered approaching 100 UK Semiconductor executives in the splendid atrium of Imagination House, Kings Langley on the outskirts of London in the UK, to discuss and debate the importance of government semiconductor strategies around the world.

Sean Redmond, our UK Managing Partner for Silicon Catalyst, set the scene by asking the audience to imagine where the UK semiconductor design industry would be if the UK Government had not implemented its last semiconductor strategy in 1979. There would quite possibly have been no Inmos, which was supported by the UK government at that time. Inmos gave birth to one of the world's first parallel processor architectures, the Transputer and a rich pool of processor design expertise. Inmos was subsequently acquired by SGS Thompson, which became ST. Hence with no Inmos, there would not have been a STMicroelectronics Bristol site. Some of our most successful fabless semiconductor startups were created by teams that cut their teeth in STMicroelectronics. Element 14, Icera and subsequently Graphcore for example may never have been created. XMOS was also founded



by an ex-Inmos genius, David May. Sir Hossein Yassaie was ex Inmos, so again there probably would have been no Imagination Technologies. Acorn's transition to a chip design team, was fuelled by skills from Inmos, so without Inmos there may never have been an Arm.

We started the evening with a very warm welcome from Ray Bingham, Executive Chair of Imagination. He provided great insight into the accelerated progress they are making, which the strong investment backing his team has delivered. This was followed by Jim Wallace, strategic business development director from Imagination Technologies, projecting the value of their open access semiconductor startup program.

The effervescent semiconductor industry analyst Malcolm Penn blew our ears off with a rollercoaster ride through his semiconductor industry four horse men of the apocalypse forecast analysis. It certainly doesn't look like any one of the horses will save the day in '23.

Silicon Catalyst UK Ltd has been commissioned by the UK government Department for Science, Innovation & Technology (DSIT) to undertake a study into infrastructure to grow the UK semiconductor industry and a new strategic



coordination function for the sector. Sean Redmond, our UK Managing Partner, shared with the audience the vibrance of the UK IC design company landscape by presenting a cluster map of 193 unique companies shown across the UK, many with multiple sites.

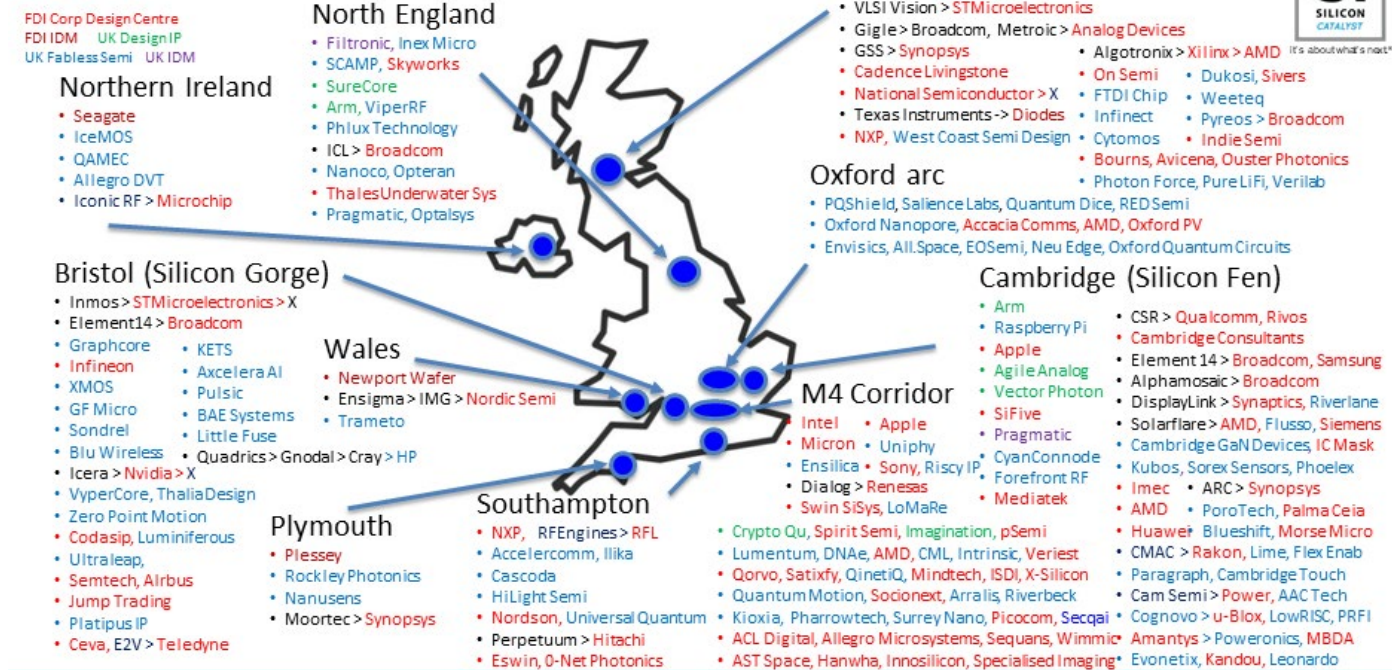
The event then launched into the first panel discussion of the afternoon, chaired by Sean Redmond, by challenging the panel with debating the biggest elephant in the room, government semiconductor policy interventions. Starting with a deep dive on the EU CHIPS Act from Malcolm followed by comparisons to the US CHIPS act from the

extremely knowledgeable Dr John Goodenough. Then the wonderful Giorgia Longobardi, founder and CEO of Cambridge GaN Devices, projected out the opportunities for GaN semiconductor market growing at a staggering 57% CAGR to north of \$2Bn by '27. Firmly planting the flag for the need for an open compound semiconductor fab in the UK. Our most successful UK semiconductor CEO, Jalal Bagherli, then stressed the importance of international collaboration with all government semiconductor policy interventions to make sure they all complement one another.





## IC design clusters in the UK



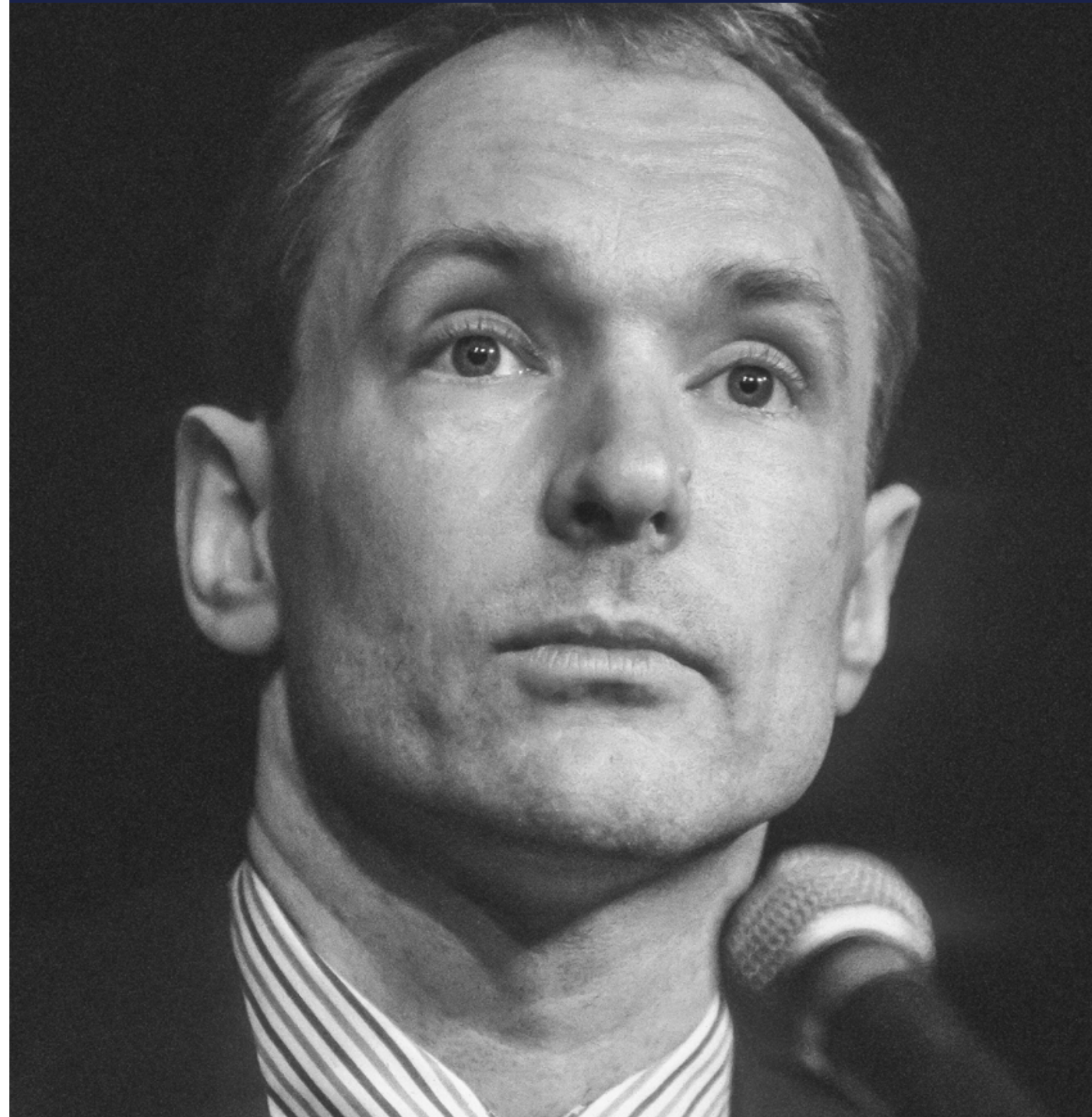
The second panel session of the afternoon was chaired by our gregarious Silicon Catalyst Managing Partner from Israel, Moshe Zalcbeg. Russell Haggart, one of our UK based Silicon Catalyst advisors, talked about the near extinction event of Silicon Valley Bank. The brilliant Vaysh Kewada, CEO of our UK portfolio company Saliency Labs, enthused about the help she received from Silicon Catalyst to help raise her very successful seed round. Followed by James Cannings, the CEO of one of newest UK portfolio Companies QPT, gave his insights into the very attractive tax benefits on offer in the UK from the

Seed Enterprise Investment Scheme. Before opening the floor for questions, Ian Lane from one of the UK leading semiconductor VC's, Cambridge Innovation Capital, gave a very clear explanation of how startups can use convertible loan notes.

The event was capped off with very productive networking over a splendid buffet dinner and enthusiastic sampling of Castello Redmond '22 made organically in the UK from Montepulciano grapes imported from Abruzzia in Italy by our Managing Partner, Sean.



## Sir Timothy Berners-Lee



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## U.K. Should Emulate Israel for Semiconductor Startups to Succeed

Senior executives from the U.K. semiconductor industry met at Bletchley Park to discuss how to nurture and grow the country's semiconductor startups.

Reprinted from EETimes Europe / October 14, 2021 Nitin Dahad

This week, some of the most successful senior executives from the U.K. semiconductor industry gathered at the birthplace of modern computing, the Bletchley Park National Museum of Computing, to discuss how to crack the code to chip startup innovation in the country.

It was rather like a re-run of Captain Ridley's shooting party [see my note at the end of this story], quipped Sean Redmond, managing partner of the accelerator Silicon Catalyst, co-host of the gathering this week with the National Microelectronics Institute (NMI). The two organizations announced a collaboration just a couple of weeks ago to work on creating the right environment for more U.K. semiconductor startups to be more successful globally.

The gathering this week was aimed at bringing together in a room those who can potentially help make that happen, discuss what are the challenges and the possible solutions. There were successful chip and EDA industry veterans like Jalal Bagherli, Simon Davidmann, and Stan Boland, as well as other influencers in the ecosystem such as John Goodacre and Neil Dickens, plus of course various startup founders, as well as government representation on semiconductor industry policy.

The debates on challenges are for semiconductor startups in the country

threw up some common themes, as we heard from two startups, Saliency Labs and Cascoda, as well as the panel discussion that followed.

It won't be anything new for those familiar with the U.K. scene over the last 20-25 years as it's the same old story: lack of long-term capital for scaling up, access to talent, and the right kind of support from government programs. On the latter point, one panelist said many U.K. startups have to apply for DARPA funding in the U.S. or look for European Union grants, as there's no real program for them in the U.K.

The CEO and co-founder of Saliency Labs, Vaysh Kewada, talked about her experience as a new startup established in 2020, and how as part of the Silicon Catalyst program the company already raised its first funding in March 2021, and is about to close its second round of funding to build the company's prototype chip. She highlighted the top three needs of a semiconductor startup as supply chain, customer integration, and hiring at speed. On the supply chain, she said being part of Silicon Catalyst helps, especially since their SoC is multi-platform. Customer integration is also essential as, she said, "We need to be able to show traction and demonstrate integration with a customer's requirement, hence the need to work closely with customers."

Saliency Labs is developing a

high-speed photonics chip for AI acceleration. The company has shown that photonic processors can process information much more rapidly and in parallel, something electronic chips are incapable of doing. Their work on this was published in the Nature journal earlier this year. Kewada said, "The market needs a new compute platform as a result of the end of Moore's Law and with AI compute requirements doubling every three months. With the rise of silicon photonics, we have been able to come together as a team to create hybrid photonic in-memory compute. Photonics can enable us to get up to 50x improvement in inferences per second per watt compared to electronics."

Meanwhile, Bruno Johnson, CEO of Cascoda, explained how his company played the long game having established the company in 2007 and without having the support of a dedicated chip industry support network as provided by Silicon Catalyst now. He talked about how Cascoda worked over many years to realize their vision of enabling standards-based IoT to address the huge lack of interoperability in the industry. It invented a new type of radio demodulator which offers a significant increase in range by improving receiver sensitivity, without sacrificing power consumption and with no need for a power amplifier. Johnson's approach to growth is to work on



**NITIN DAHAD**

Nitin Dahad is a Editor-in-Chief of embedded.com, and a correspondent for EE Times, and EE Times Europe. Since starting his career in the electronics industry in 1985, he's had many different roles: from engineer to journalist, and from entrepreneur to startup mentor and government advisor. He was part of the startup team that launched 32-bit microprocessor company ARC International in the US in the late 1990s and took it public, and co-founder of The Chilli, which influenced much of the tech startup scene in the early 2000s. He's also worked with many of the big names - including National Semiconductor, GEC Plessey Semiconductors, Dialog Semiconductor and Marconi Instruments.

developing a scalable technology that integrates into existing infrastructure, and work with or be part of standards bodies (he's involved with the Thread Group as well as the Open Connectivity Foundation).

### THE PANEL: WHERE ARE WE NOW, WHERE DO WE WANT TO GO?

Having heard from the two startups, the panel dissected where is the U.K. semiconductor industry right now as regards nurturing startups, and where could the industry learn from.

Tim Ramsdale, CEO of Agile Analog, a four-year old startup who recently closed a \$19 million funding round, highlighted that the semiconductor industry is a long-term play, in the range of 20-30 years. "But in the U.K., the appetite for investing in semiconductors wasn't really there, say five years ago. We also need larger ecosystem players here," he commented, the latter point referring to the ability to get a wider skills and talent pool to enable hiring locally.

John Reilly, the sales director for silicon partners in EMEA, India and Russia for Arm, illustrated how Israel has managed to succeed with nurturing its chip startup ecosystem and how this could be a model for the U.K. "Our business in Israel is almost exclusively with startups. So what lessons can we learn? Well, if you look at the Israeli military, it churns out a pool of experienced resources [who then go on and do their own tech startups when they leave]." In addition, he said success breeds success. "This is when successful entrepreneurs go and help other startups and also become role models themselves."

Reilly certainly has a key point. Two of Israel's military units, unit 81 and unit 8200, have alumni who have launched many successful technology startups. Since they are elite units looking at things like security and intelligence, and whose remit is to use technology to develop solutions that keep Israel safe, they have excellent skills and experience of using technology to solve real world problems.

When they come out of the units, they already have teams that have worked together successfully so often come together to form their own startups – an example of a recent one is NeuroBlade, who just raised \$83 million for its compute-in-memory chip. Hailo is another example. According to one report earlier this year, soldiers and officers who served in Unit 81 between 2003 and 2010 have since then founded many startups – in fact around 100 veterans from the unit at the time founded 50 companies and have raised over \$4 billion, with valuations over \$10 billion.

Coming back to the panel, Alec Vogt, director northern Europe for Synopsys, talked about the importance of an accelerator like Silicon Catalyst for startups. "In the U.K., there is no lack of creative ideas. However, what happens next is not so great. Because there isn't an appetite for longer term investment in semiconductors in the U.K., the ecosystem supporting semiconductor investments is weak, and there are no real government funding programs." He then said that there was a danger of the country closing in on itself. "We need to be open, create a pool of talent, bring

expertise and funding here so that the great ideas can have more chance of becoming a success."

The Silicon Catalyst and NMI collaboration is meant to address some of the issues around access to various aspects of support, including tools and in-kind benefits from key partners of the network, plus access to funding sources.

Redmond said, "The UK has world class research universities and a track record for semiconductor innovation. It also has fifteen semiconductor fabs specializing in advanced processes for photonics, power and mixed-signal RF applications. This manufacturing base has been extended with a strong MEMS, PICs and ASIC ecosystem. Combining these local assets with international partners and entrepreneurial drive creates a springboard for semiconductor startup success." Hence, his vision was to help create a better support network for semiconductor startups to help them grow.

Meanwhile, the legal entity behind NMI, called TechWorks, was keen to work with Silicon Catalyst to 'de-risk' the path to growth for chip startups in the country. The CEO of TechWorks, Alan Banks, said, "By cultivating collaboration and ensuring government recognition of the semiconductor sector in areas such as automotive, IoT, communications, AI and edge computing, we have ambitions to facilitate the next generation of semiconductor companies building on the legacy of companies such as Arm, Wolfson, Icera and, more recently, Graphcore."

Note: "Captain Ridley's shooting party" was the cover name used by secret service agents from MI6 and intelligence experts who headed out to Bletchley Park in 1938 to activate the secret base that became the home of the code breaking center, where Alan Turing and many others broke a number of German codes, including that of the Enigma machine.

**STRATEGIC PARTNER** **arm**  
**Silicon Startups Contest by Arm and Silicon Catalyst**

How Arm is helping the world's silicon startups succeed

More IP, a new contest and some startup success stories from Arm Flexible Access.

Four years ago, we launched [Arm Flexible Access](#) as a new way for our partners to access Arm's industry-leading chip designs quicker, easier and, well, more flexibly.

A significant audience we are engaging is the global silicon startup community through [Arm Flexible Access for Startups](#). This provides access to a broad portfolio of Arm's extensively verified IP, tools and training on the easiest and simplest ever business terms from Arm, with clear, predictable pricing upfront and a zero cost license fee for startups to develop their silicon prototypes.



This commitment to early-stage silicon startups is important to Arm. The continued growth of the semiconductor industry will be heavily influenced by the entrepreneurial drive and innovation of early-stage startups who are providing the next wave of innovative products and technology solutions that, like Arm's, will change the world.

**The startup "game changer"**

Our approach to support startups is working. Since its introduction, Arm Flexible Access for Startups has managed to help around 100 startups and the results have been impressive.

Sohail Syed, CEO and President of [DreamBig Semiconductor Inc.](#), refers to Arm Flexible Access for Startups as "a game-changer" for the company. It allowed the silicon startup to prototype its Deimos Chiplet Hub for

next-generation datacenter solutions quickly and cost effectively, while helping to mitigate any wider technical and business challenges.

[Cambridge Touch Technologies](#), a startup developing an AI engine that runs signal processing for touch technology, is another success story. The 'design first, pay later' model of Arm Flexible Access for Startups was vital when the company signed up in 2020, as it was still in the very early stages of the funding process. The CEO and Co-founder Corbin Church says: "Within two years of signing up, we already have a second product in the pipeline and are planning to tape out our first commercial chip later this year."

**We understand startups**

From our 30 years of experience, we understand that designing silicon is

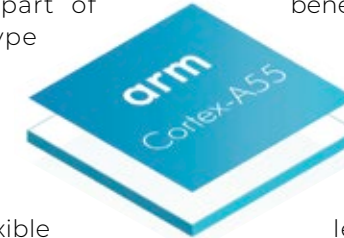
complex, expensive, and risky. Since the program launched in 2019, we've had many different discussions with early-stage startups, understanding what they need and want to design silicon effectively and efficiently. What we heard is that there are three key considerations that are front of mind for them:

- Experimenting with ease and having the ability to pivot their design as much as they need before production;
- Moving quickly and confidently with minimal disruptions; and
- Effectively controlling their cash flow to give their investors confidence.

**Access to more Arm IP**

These considerations are what guide Arm's offering through Flexible Access for Startups. We are now adding [Arm Cortex-A55 CPU](#), one of Arm's most

popular IP designs for consumer tech markets, to the broad portfolio of Arm IP and tools that we offer through Arm Flexible Access for Startups. This means silicon startups can access Cortex-A55 free of charge as part of their initial prototype development process.



[Hailo](#), a startup that has gone from strength-to-strength since joining Arm Flexible Access, commented on the importance of Arm's proven IP technology as the company started its first silicon prototype. Hailo's co-founder and chief technologist Avi Baum says: "Our technology needs to work first time and the technology contributed by the ecosystem has to be just as trustworthy."

The proven range of IP and tools allows startups to move with confidence and manage any risks during the silicon prototype process, with this being important to Eray Erdogan, Co-Founder of [HEX Microchip](#). He says: "Arm's proven IP, tools and support have helped us manage risk and start on a solid foundation, which has been a bastion of confidence leading us to success."

**Comprehensive ecosystem and technical support**

And it's not just Arm's IP and tools that we offer. Through the program, Arm's own technical network and our vast ecosystem become a free extension for small startup teams. With access to thousands of technology companies spanning hardware and software and millions of developers all building on Arm, there is a wealth of knowledge and insights to support the development of silicon prototypes.

We also offer a comprehensive package of support and training from Arm's skilled engineers. This helps startups quickly address any technical or commercial challenges faced

during the design process, speeding their time-to-market and saving costs in the long-run.

The Arm ecosystem is a key benefit valued by our startup customers. Yannick Thepaut, CEO, [EASii IC](#), says; "We can rely on the Arm ecosystem to secure projects and give the necessary level of confidence to reduce development costs and accelerate the time-to-market."

Meanwhile, Manu Nair, Founder and CEO of [Synthara AI](#), notes the quick and responsive feedback from Arm's Account team to the company's requests and how it benefited the development of its prototype. He says: "The clear and actionable support enabled us to close our design quickly and efficiently."



**Sparking fresh innovation with a new startup contest**

We are making continuous efforts to provide the benefits of the program to more silicon startups globally. [Silicon Catalyst](#) is running a "[Silicon Startups Contest](#)" in partnership with Arm for early-stage startups who are designing their next system-on-chip (SoC) with Arm processor IP.

This is a great opportunity for startups to access Arm's leading IP and save costs during the design development process, with the most innovative system-on-chip (SoC) design winning \$150,000 of Arm Technology credit towards an Arm Flexible Access tape-out. This could cover IP fees for a small embedded system, or significantly contribute to the cost of higher performance applications. The contest

winner, alongside two runners-up, will also receive a free Arm design check-in, a ticket to Arm's invite-only ecosystem event, and an investor pitch review and preparation support by Silicon Catalyst, with an opportunity to present to the Silicon Catalyst Angels group and its investment syndication network.

**Business guidance to help startups thrive**

Silicon Catalyst is one of the expert organizations that Arm Flexible Access startups can lean on for wider business support. Arm's partnership with Silicon Catalyst brings wide-ranging guidance to startups on how to reduce costs and complexity during the design development process. Another organization offering expert guidance is Sand Hill Angels, a group of 160 Silicon Valley angel investors and advisors offering business knowledge on how to scale startups effectively.

Like Arm, Silicon Catalyst and [Sand Hill Angels](#) are passionate about helping startups succeed and scale. They are part of a global Arm network of startup-specific support, including accelerators, funders, advisors, research institutes and government agencies.

Create life-changing products on Arm Through Arm Flexible Access for Startups, we are giving silicon startups the tools and support to create the very best products as efficiently and effectively as possible. Whether that's through zero cost access to our industry-proven technology, access to millions of global innovators in Arm's vast ecosystem or access to world-class technical support, we are committed to enabling the startup community to move fast, experiment with ease and design with confidence.

If you're an early-stage silicon start-up, then take a look at what [Arm Flexible Access for Startups](#) can offer you on your first step towards changing the world with your products that are built on Arm.



## STRATEGIC PARTNER



### Silicon Startups Contest by Arm and Silicon Catalyst

#### Silicon Catalyst announces

#### “Silicon Startups Contest” in partnership with Arm

*Worldwide call for applicants to qualify and win significant commercial and technical support from Arm*

**Silicon Valley, California and Cambridge, UK – May 10, 2023** – Silicon Catalyst, the world’s only accelerator focused exclusively on accelerating semiconductor solutions, is pleased to announce a “Silicon Startups Contest” in partnership with Arm. The contest, launching today, is organized and administered by Silicon Catalyst and is directed towards early-stage entrepreneurial teams developing a system-on-chip (SoC) design using Arm® processor IP (intellectual property), proven in more than 250 billion chips shipped worldwide.

The contest offers an opportunity for silicon startups to win valuable commercial, technical and marketing support from Arm and Silicon Catalyst. The winner will receive Arm credit worth \$150,000, which could cover IP fees for a complete embedded system, or significantly contribute to the cost of a higher performance application. In addition, both the winner and two runners-up will receive:

- Access to the full [Arm Flexible Access for Startups](#) program, which includes:
  - No cost, easy access to an extensive SoC design portfolio including a wide range of Cortex processors, Mali graphics, Corstone reference systems, CoreLink and CoreSight system IP.
  - Free tools, training, and support to enhance your team
  - \$0 license fee to produce prototypes
- Cost-free Arm Design Check-in Review with Arm’s experienced support team
- Entry to an invitation-only Arm ecosystem event with a chance to be featured and connect with Arm’s broad portfolio of silicon, OEM and software partners
- Investor pitch review and preparation support by Silicon Catalyst, with an opportunity to present to the Silicon Catalyst Angels group and their investment syndication network.

“We believe that Arm technology is for everyone, and early-stage silicon startups trust Arm to deliver proven, validated computing platforms that enable them to innovate with freedom and confidence,” said Paul Williamson, senior vice president and general manager, IoT Line of Business at Arm. “Since its launch, Arm Flexible Access for Startups has enabled around 100 startups with access to our wide portfolio of IP, extensive ecosystem and broad developer base, and we look forward to seeing what creativity this prize inspires in the exciting new startups that enter this contest.”

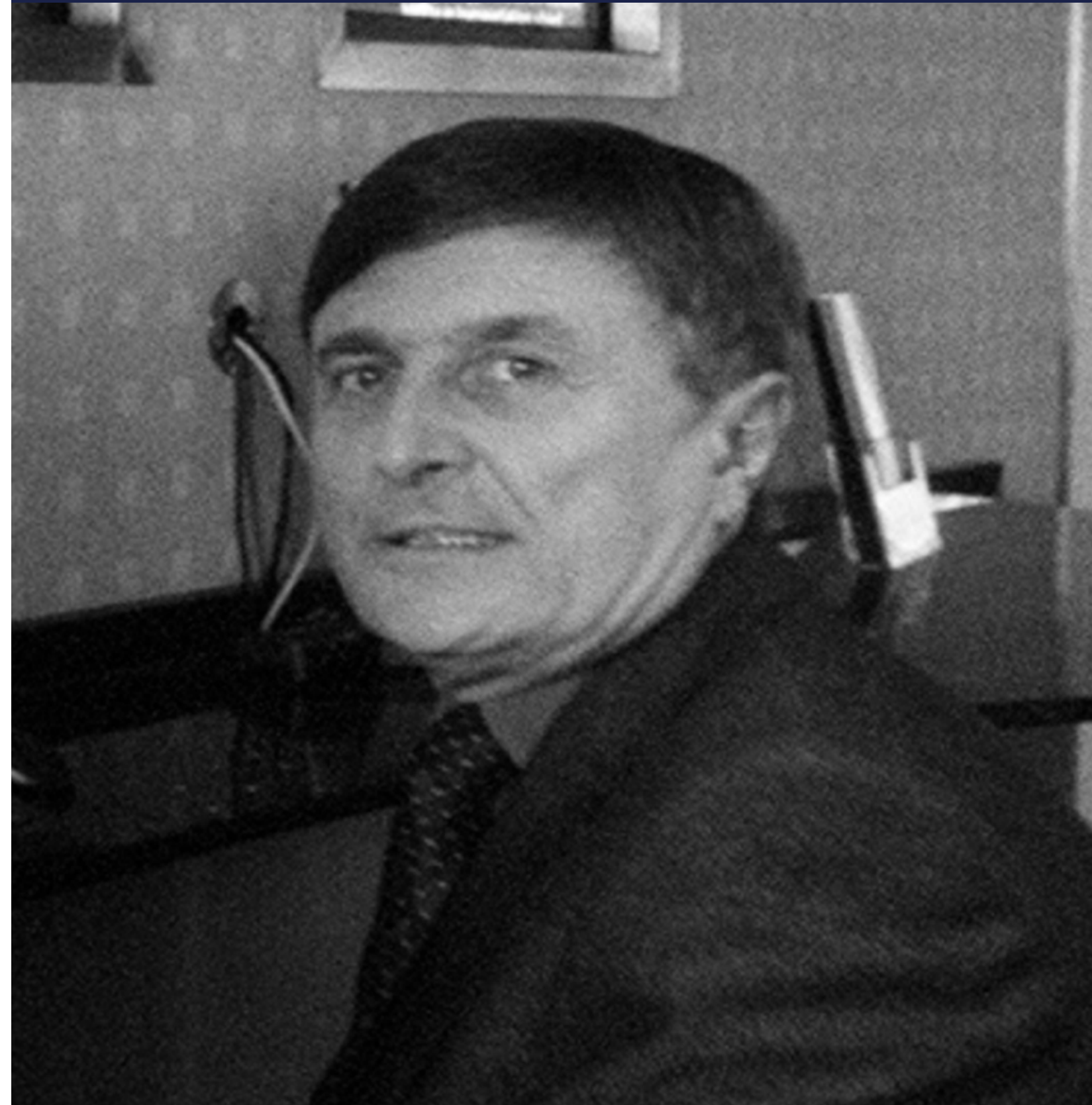
The contest is open to startup companies in pre-seed, seed and Series A funding, that have raised a maximum of \$20M in funding and all contest applicant organizations will be considered for acceptance to the Silicon Catalyst Accelerator/Accelerator. Judges include senior executives from both Arm and Silicon Catalyst.

“Arm was the first member of our ecosystem to join as both a Strategic Partner and an In-Kind Partner. Their Flexible Access program is a game-changer for startups. Through this program, silicon startups can move fast, experiment with ease, and design with confidence – so it’s a highly valuable part of the contest prize,” stated Pete Rodriguez, Silicon Catalyst CEO. “Entrepreneurial teams entering the contest will also automatically be applying to our Accelerator, with the winning company receiving credit with Arm that could give them a significant head start in the commercialization of their product, as well as the opportunity to present to the Silicon Catalyst Angel investment group and their syndication network of investment partners.”

The contest will run from May 10, 2023 through to June 23, 2023. The contest winner and two runner-up companies will be announced in early July 2023. Contest rules and application details can be found at:

<https://siliconcatalyst.com/arm-sic-contest-2023>

Sir Robin Saxby



it all happen’s here.





## STRATEGIC PARTNER NXP

scalable communication networks.

**Industrial and IoT.** For industrial and IoT applications, NXP supplies simplified machine learning solutions that automate better decision-making at the device level for Industry 4.0 applications. Our portfolio of connectivity devices supports every major wireless communications protocol.



**Mobile,** covering both mobile devices and wearable technology, we provide solutions for connected lifestyles that involve data moving more freely and transactions that are easy, safe, and secure.

Our products are also increasingly relied on for smart home and smart city applications. We support smart home applications with solutions that listen, learn, and adapt into the places we call home for more comfort, safety, and convenience. Our smart city solutions simplify how people access and interact with local services to achieve new standards of sustainability, efficiency, mobility, and economic growth.

### THE ROAD AHEAD

NXP is poised to address what will surely be some of the biggest technological growth markets for years to come. Smart devices will become more pervasive because they help make our world richer, more fulfilling, safer and more secure, as well as more environmentally responsible. As electronics proliferate in our lives, the world will become more connected, and smarter because of it. We see that happening now with electric vehicles with ADAS features, mobile wallets, smart factories, and so much more. We

look forward to working with Silicon Catalyst and its ecosystem of startups and young companies to imagine and help create what comes next.

<https://siliconcatalyst.com/silicon-catalyst-welcomes-nxp-electronics-as-newest-strategic-partner>

### EXPERIENCE

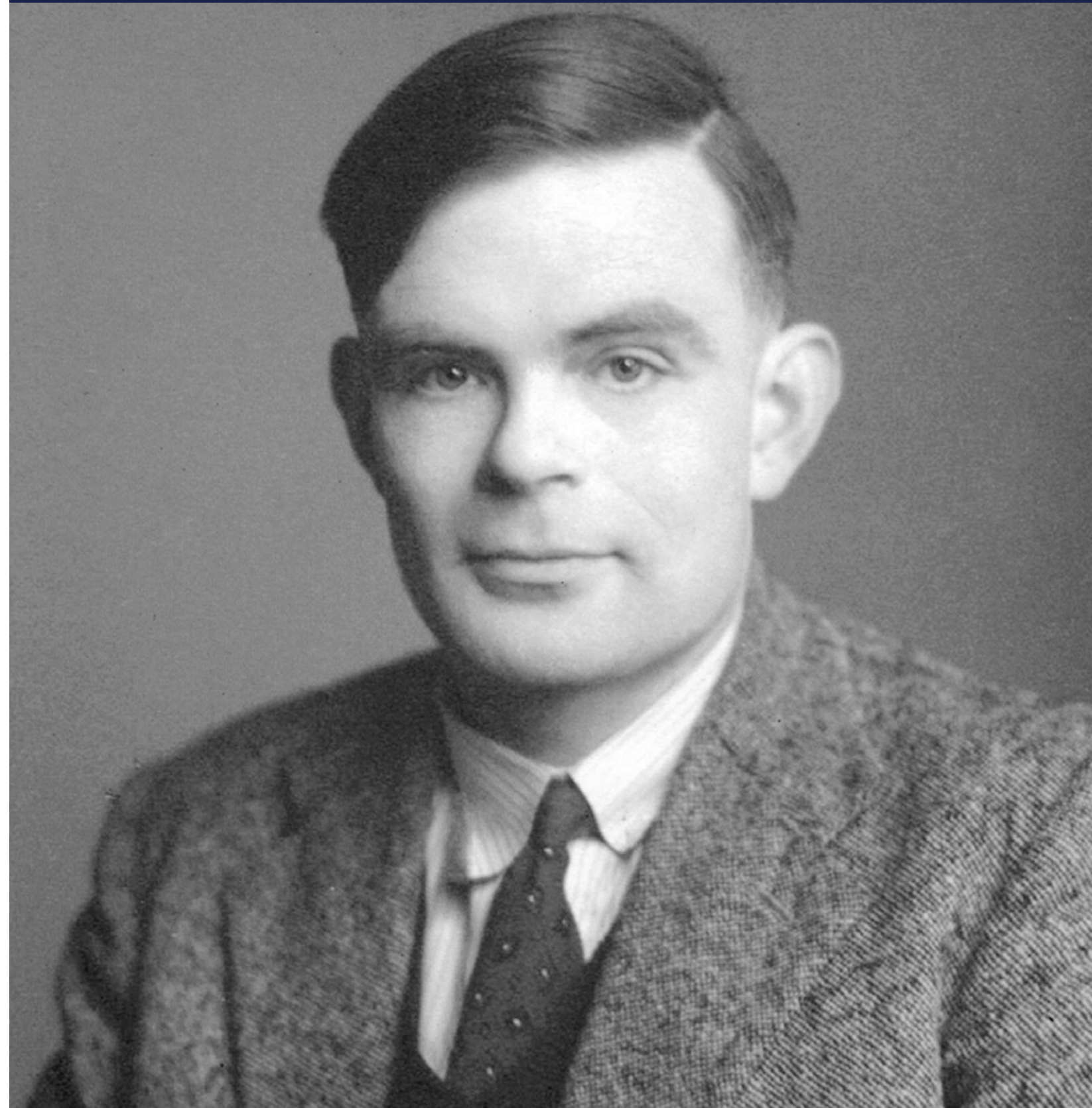
Lars Reger is executive vice president and chief technology officer for NXP Semiconductors. As CTO, Lars is responsible for managing new business activities and R&D in the automotive, industry 4.0, internet of things (IoT), mobile, connectivity and infrastructure focus markets.

Before joining NXP as head of automotive strategy in 2008, Lars gained deep insight into the microelectronics industry with a focus on the automotive sector. He began his career with Siemens Semiconductors as a product engineer in 1997. His past roles at Infineon included head of the process and product engineering departments, project manager for mobile system chips and director of IP management. At Continental, Lars was responsible for business development and product management within the connectivity business unit.

In 2012, Lars was appointed CTO of Automotive at NXP and in December 2018, he was appointed NXP's CTO with responsibility for the overall technology portfolio.



# Alan Turing



it all happen's here.

## Silicon Catalyst Partners with Sony Semiconductor Solutions to Accelerate Semiconductor Startups

Silicon Valley, CA November 29, 2021

### Partnership will focus on innovations beyond image sensors

Silicon Catalyst, the world's only accelerator focused exclusively on accelerating solutions in silicon, announces that Sony Semiconductor Solutions Corporation ("Sony"), the global leader in image sensors, has become its ninth Strategic Partner. The partnership will expand Sony's access to new innovations in sensing solutions development and facilitate Sony's ability to create strategic relationships with pioneering young companies that are developing technologies complementary to Sony's internal innovation. In addition, the partnership further strengthens Silicon Catalyst's leading role in helping new semiconductor companies address the challenges in moving from idea to realization.

"Sony is always open to collaborating with outstanding entrepreneurs, young technology companies and industry experts. This partnership is another example of our approach," said Yasuhiro Kono, Corporate Executive, CFO of Sony Semiconductor Solutions Corporation. "We look forward to working with Silicon Catalyst's community, and through this partnership establishing better and more open strategies in the design and development of next generation sensing platforms."

Silicon Catalyst has created a unique ecosystem

Device business by the Sony Semiconductor Solutions Group is focused on image sensors, and includes a variety of other parts including microdisplays, LSIs, and laser diodes. In image sensors, where we command the top share of the global market, mobile applications are central, with growth expected in new areas such as automotive cameras, security cameras, and factory automation. One use of image sensors is in viewing applications for conventional digital cameras or mobile devices, where they make devices more convenient or enjoyable for individual users. Another use is in recognition, where they bring greater convenience, safety, and security to society. We have positioned this use in sensing as our next pillar of growth, and our long-term vision calls on us to fulfill essential roles in society as a leader in this field. To date, the Sony Semiconductor Solutions Group has created new markets for image sensors through innovation, and looking ahead, we will continue to take on challenges for further growth. [www.sony-semicon.co.jp/e/](http://www.sony-semicon.co.jp/e/)

to provide critical support to semiconductor hardware startups as they move from idea through prototype to initial product. In its seventh year of operation, Silicon Catalyst has reviewed over 400 early-stage companies and has admitted 48 startups into the accelerator. These Portfolio Companies have access to tools and services from a comprehensive network of In-Kind Partners (IKPs) -- including design tools, simulation software, design services, foundry PDK access and MPW runs, test program development and tester access -- that dramatically reduce the cost of chip development. Additionally, the startups tap into the world-class Silicon Catalyst network of advisors and investors.

"Sony Semiconductor Solutions is the world's leading image sensor company, and we are delighted to have them join the Silicon Catalyst ecosystem as our first Asian Strategic Partner," said Nick Kepler, COO of Silicon Catalyst. "Sony has developed and deployed many generations of technical invention in image sensors, and we are excited to explore the next generations with them as image sensors evolve to include memory and AI while supporting always-on systems that bring greater convenience and possibilities to our world. Our partnership connects Sony with Silicon Catalyst's curated portfolio of some of the most interesting semiconductor hardware startups; it also makes Sony more accessible to these startups, which reap tremendous benefits from deep, long-term engagements with industry leaders like Sony who can provide guidance and relationships with experts."

## Sony Semiconductor Solutions

In November 2021 Sony Semiconductor Solutions (SSS) joined the Silicon Catalyst ecosystem as a Strategic Partner. Today, we would like to explain our business environment and strategic direction within this journal. Also, we are sharing our corporate slogan that we have established this year to help our stakeholders understand the SSS Group's goals and business activities. We hope to deliver our message to partners whom cooperate and co-create our goals.

### OUR MARKET POSITION AND DIRECTION

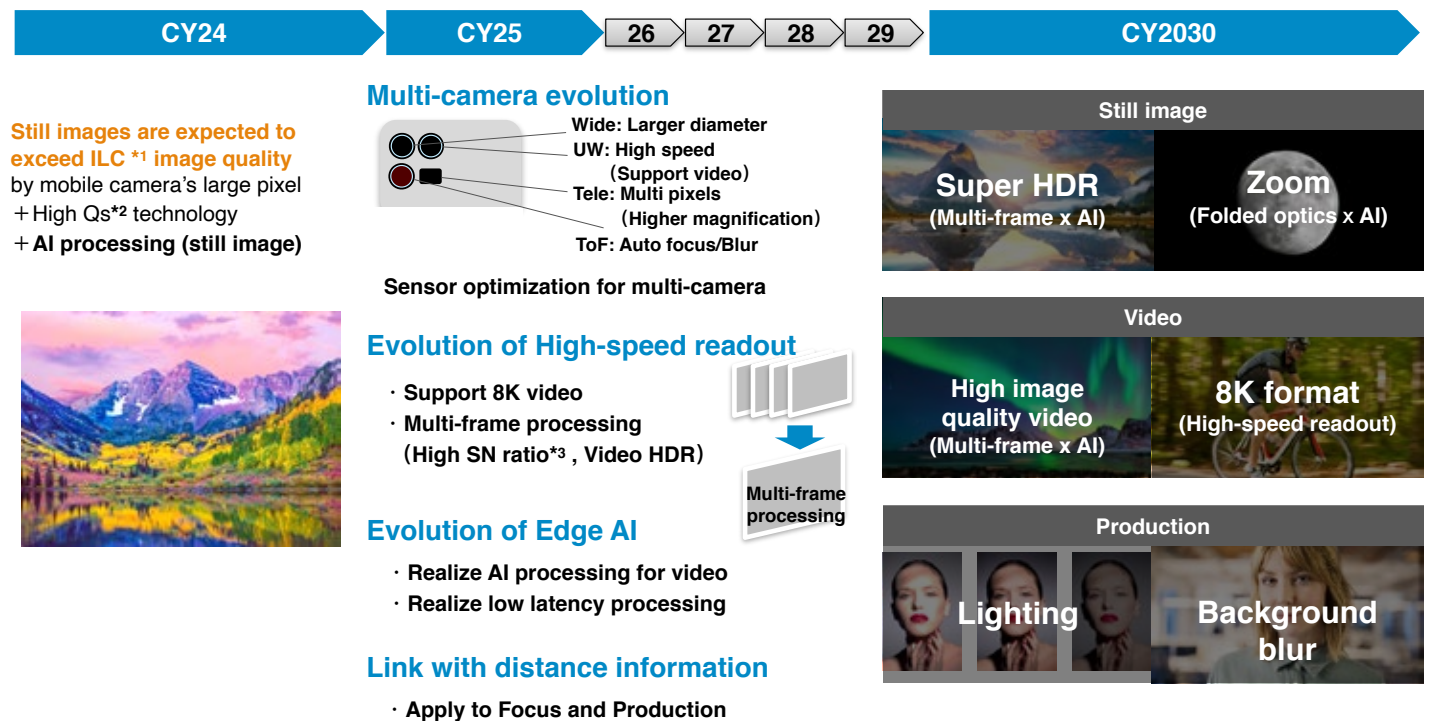
Sony Semiconductor Solutions Corporation is a wholly owned subsidiary of Sony Group Corporation and the

global leader in image sensors. In FY21, SSS had image sensor sales of 947.3 billion yen and 43%\* value share of the market. We divide our business domain into three areas, "Mobile Imaging", "Sensing", and "AV". As to mobile imaging, we believe that it will continue to account for the majority even in 2030. In terms of sensing, the ADAS area in automotive is expected to expand. The market for industrial applications is growing due to continued labor savings and automation needs. On top of these areas, we expect market growth within our solution business, which we are currently working on.

We strive to continue to maintain our No.1 position in

\*Source Sony

### DIRECTION OF MOBILE IMAGING TECHNOLOGICAL EVOLUTION



\*I.C: Interchangeable Lens Camera \*2: Quantum saturation \*3: SN Ratio: Signal-to-Noise Ratio

the share for the worldwide CMOS image sensor market and provide advanced imaging technologies that bring greater convenience and joy to people's lives. We also work to develop and bring to market new kinds of sensing technologies with the aim of offering various solutions that will take the visual and recognition capabilities of both human and machines to greater heights.

**MOBILE IMAGING INITIATIVES**

In mobile imaging, image sensors for high-end smartphones are expected to grow significantly through 2030. When it comes to high-end models, smartphone makers continue to position cameras as an important differentiating factor and are pursuing high-performance camera systems. Smartphone makers who have their own Application Processors are doing this, so too are makers who utilize general-purpose Application Processors. They are trying to realize a new imaging experience by developing their own Image Signal Processors. What is required here is large pixels and large-sized image sensors. We will continue to focus the most on high-end models and develop high-value-added image sensors that

contribute to high image quality and multi-functionality. As one of the technological developments for high added value, we announced the world's first pixel structure called stacked CMOS image sensor technology with 2-Layer Transistor Pixel.

<https://www.sony-semicon.co.jp/e/news/2021/2021121601.html>

Based on the technological development we have underway and looking to 2030, we think that technological evolution will progress on the axes of still images, videos, and production. In the still images space, super HDR and zoom functions can be realized, and for video, high image quality and high-speed reading at 8K can be realized. Furthermore, it is expected that production functionality, like getting directions on how to take a good picture, will evolve.

Evolution of multi-camera systems, evolution of high-speed readout, evolution of Edge AI, and coordination of distance information with production are all possibilities. As such, mobile imaging remains a technology driver and an area with great room for technological evolution.

**STRATEGIC ECOSYSTEM PARTNER**

**PROFILE**

**Sony Semiconductor Solutions**

**SENSING INITIATIVES**

Next is the sensing area. In the future, we believe that the era of the "Sensing Society" will come with sensing technology and become an important foundation of society as a whole. The potential of the image sensor, which captures a lot of information, is particularly large. Here we would like to explain more on the automotive, industry, and solutions areas.

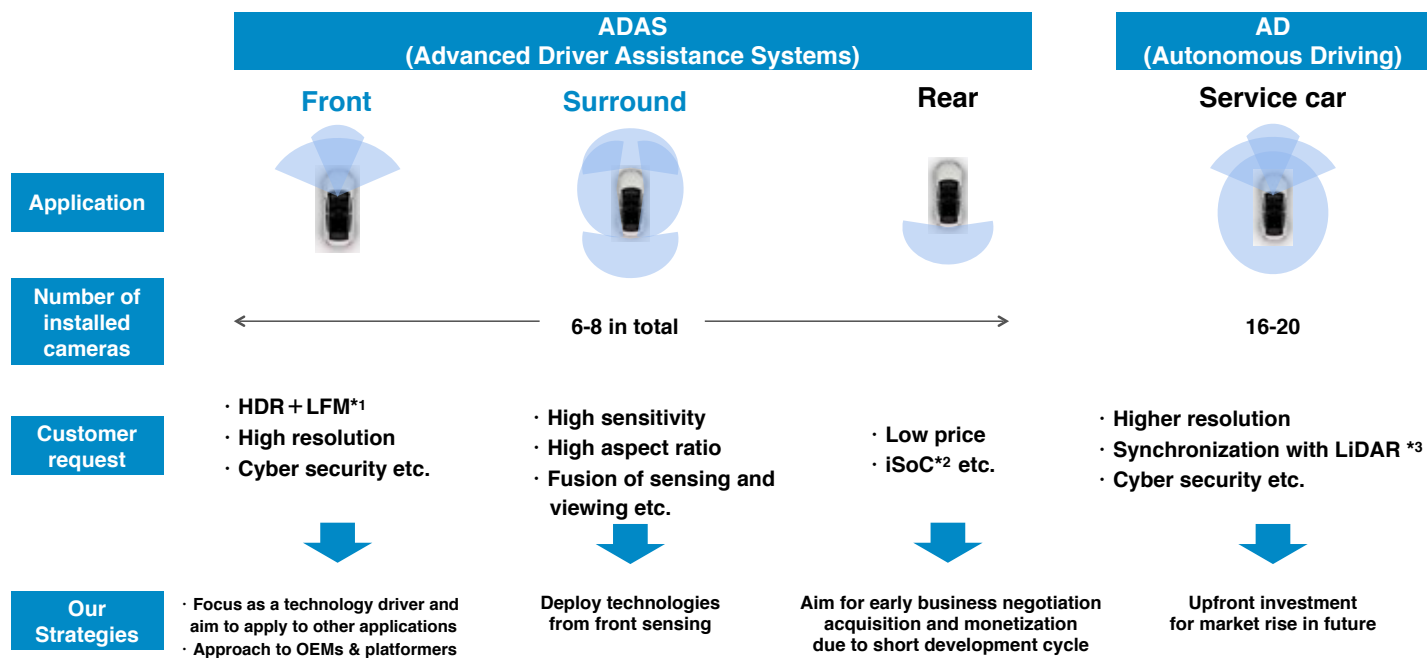
**AUTOMOTIVE AREA**

First is the automotive area. In automotive cameras, there are two major areas, ADAS and Autonomous Driving. The ADAS area is further divided into three areas: front, surround, and rear. By focusing on the front,

we will build a competitive advantage and leverage that advantage in other applications. Surround is also an important area where we aim to win business in this area by leveraging the technology we will develop in the frontal area. In terms of product other than the CMOS image sensor, we have developed and announced a stacked single-photon avalanche diode (SPAD) depth sensor for automotive LiDAR. By employing SPAD pixels as the detector in a direct Time-of-Flight (dToF) sensor, it is possible to accomplish long-distance, high-precision distance measuring.

<https://www.sony-semicon.co.jp/e/products/IS/automotive/technology.html>

**DIRECTION OF AUTOMOTIVE AREA**



\*1 LFM: LED Flicker mitigation \*2 iSoC: Image sensor with ISP \*3 LiDAR: Light Detection And Ranging

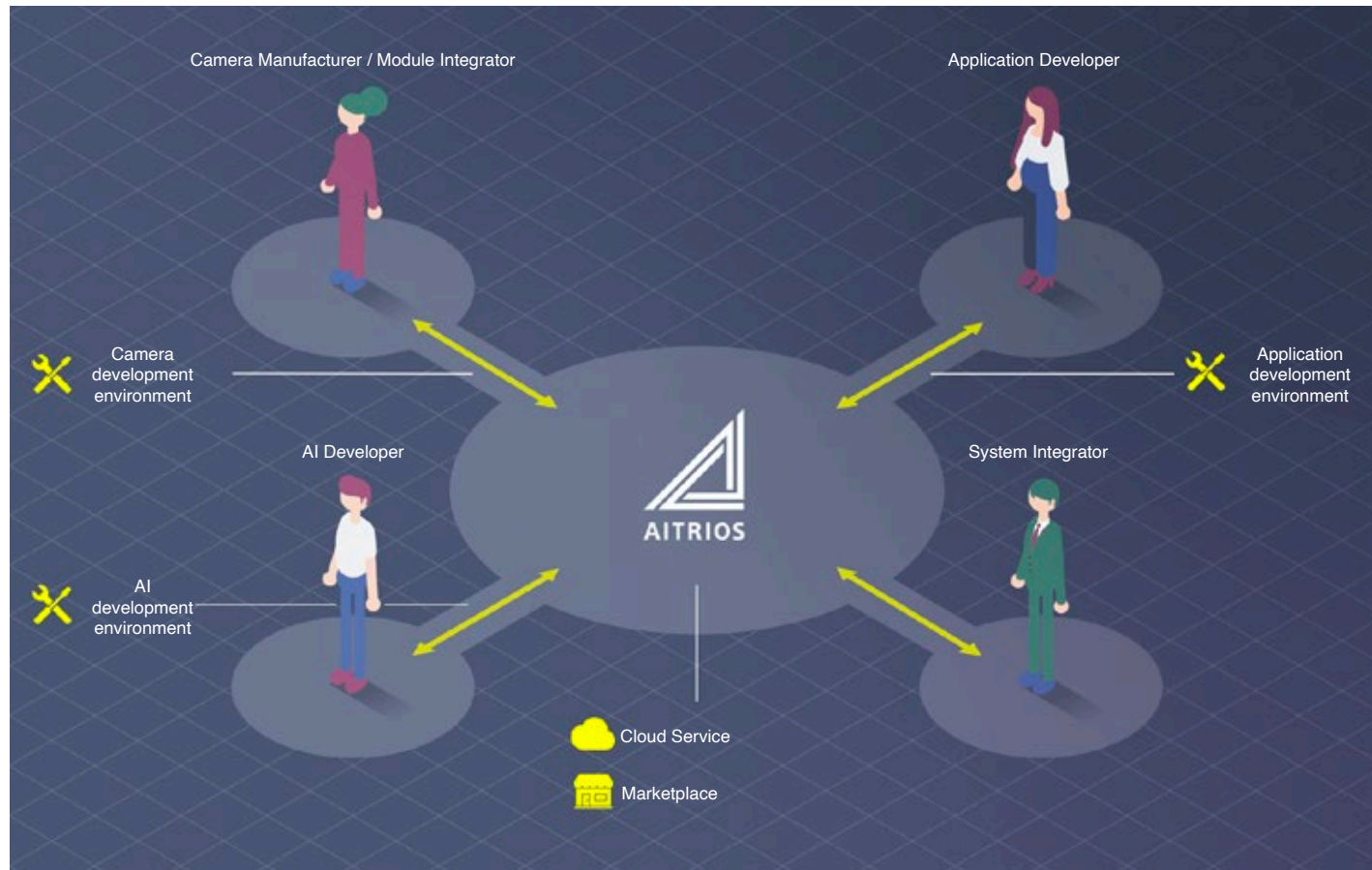
**INDUSTRIAL APPLICATIONS**



\*1 RS: Rolling Shutter  
 \*2 GS: Global Shutter  
 \*3 EVS: Event-based Vision Sensor  
 \*4 SWIR: Short Wavelength Infra-Red



## SOLUTION BUSINESS



### INDUSTRY AREA

In the industry area, in addition to global shutters, polarization, and Time-of-Flight, mainly for factory automation, we have released many sensors, such as large format image sensors with global shutter, event-based vision sensors, SWIR sensors, and UV sensors. We believe that these diverse sensor models are our greatest strength.

<https://www.sony-semicon.co.jp/e/products/IS/industry/>

### SOLUTION BUSINESS

In the solutions business which we are continuing to pursue, we announced the edge AI sensing platform "AITRIOS™" last October for further expansion of our solutions business. With AITRIOS, we also aim to take on the challenge of our recurring business in addition to our sensor business.

<https://www.aitrios.sony-semicon.co.jp/en>

### "SENSE THE WONDER"

"Sense the Wonder" is a corporate message from us to encourage society to "feel more curiosity" and "make the world more full of surprises and excitement." We believe that new encounters with people who respond favorably to the idea contained in this slogan will lead to creation of new value.

<https://www.sony-semicon.co.jp/e/company/vision/>

Visit us at: <https://www.sony-semicon.co.jp/e/>

AITRIOS is the registered trademark or trademark of Sony Group Corporation or its affiliated companies.

Sir Robert Watson-Watt



it all happen's here.

**STRATEGIC PARTNER**  
**EMD ELECTRONICS**



Collaborating with Startups to Accelerate Semiconductor Product Disruption in a Materials World

by Dr. Jacob Woodruff, Head of Technology Scouting and Partnerships

The number of different materials used in next-generation technologies and products is increasing dramatically, and startups, in particular, are exploring many variations for their new products.

EMD Electronics and Silicon Catalyst have partnered to encourage emerging companies in the semiconductor materials, process, and device space to join Silicon Catalyst, where selected companies

will get access to resources for various stages of product development and commercialization. Collaboration with EMD Electronics can provide valuable opportunities, including proof of concept, joint development agreements, materials and expertise support, early customer validation, and introduction to its strategic investment arm, MVentures.

In addition, Silicon Catalyst is partnering with Intermolecular, the

Silicon Valley science hub of Merck KGaA, Darmstadt, Germany and its electronics business which operates as EMD Electronics in the U.S. and Canada. Through their Startup Accelerator program, Intermolecular engages the start-up ecosystem to offer R&D services and explore potential new applications. These can be in areas ranging from neuromorphic computing and architectures, quantum computing to sustainability, and semiconductors -



**DR. JACOB WOODRUFF**  
**HEAD OF**  
**TECHNOLOGY SCOUTING**  
**AND PARTNERSHIPS**

Dr. Jacob Woodruff is Head of Technology Scouting and Partnerships, NA and EU, with EMD Electronics, where he works to find and advance external early stage and disruptive technologies. Dr. Woodruff is an experienced technologist, having managed global R&D groups developing semiconductor deposition materials at EMD Electronics. Previously, he lead ALD process technology development teams at ASM, and at SunPower and Nanosolar, managed R&D labs and developed processes for solar cell manufacturing. He holds a Masters in Materials Science and Engineering and a PhD in Physical Chemistry from Stanford University.



any application where materials play a key role in product development.

“As our science hub in the Silicon Valley, Intermolecular acts as a valuable toolbox of integral research, testing, and development capabilities that allow us to continuously advance material innovation,” said Jacob Woodruff, Head of Technology Scouting & Partnerships, EMD Electronics

“Intermolecular’s custom-built tools, test vehicles, and rigorous analytics, coupled with tailored methodologies enable IP-protected, high-quality data generation for accelerating materials, processes, and device learnings,” added Ganesh Panaman, Head of Intermolecular.

Intermolecular is the trusted partner in materials innovation and can work with startups to help accelerate the speed of learning and generate datasets for AI/ML through its full suite of innovation services. These include screening materials to identify which ones will work best for the startup’s goals, exploring multiple materials for

a given application, studying materials companies are most interested in, and delivering solutions to customers’ specifications.

Additionally, Intermolecular’s proven workflows and simplified test vehicles can be deployed to physically, optically, and electrically characterize individual films and film stacks and understand their impact on device performance. The result is demonstrated high-quality and comprehensive data sets that customers leverage to make confident material decisions that lead to smarter product development.

Whether it is achieving a proof-of-principle, a first prototype, or a small series production, Intermolecular tailors solutions to meet a startup’s unique needs.

**ABOUT EMD ELECTRONICS**

EMD Electronics is the U.S. and Canada electronics business of Merck KGaA, Darmstadt, Germany. EMD Electronics’ portfolio covers a broad range of products and solutions, including high-tech materials and solutions for the semiconductor

industry as well as liquid crystals and OLED materials for displays and effect pigments for coatings and cosmetics. Today, EMD Electronics has approximately 2,000 employees around the country, with regional offices in Tempe (AZ) and Philadelphia (PA). For more information, please visit [www.emd-electronics.com](http://www.emd-electronics.com).

**ABOUT INTERMOLECULAR**

Intermolecular is a trusted partner for materials innovation and the Silicon Valley science hub of Merck KGaA, Darmstadt, Germany and its electronics business. Intermolecular explores, tests and develops advanced materials that are revolutionizing the next generation of electronics that make lives easier, entertaining and more productive. For more than 15 years, the team, methodologies and quality data have driven impactful outcomes, market opportunities and innovative product designs for customers.

Reach out to us at [jacob.woodruff@emdgroup.com](mailto:jacob.woodruff@emdgroup.com) to learn how we can accelerate the discovery and development of your products.

## SEMICONDUCTOR REVIEW PHOTONICS

### Silicon Catalyst: An Accelerator Created Just for Semiconductor Startups

[www.semiconductorreview.com](http://www.semiconductorreview.com)

Semiconductor companies have seen drastic growth in the number of patents, market share, and revenue. Despite these impressive numbers, raising funds in the semiconductor industry is not as easy as it might seem. See the graph on page 64 from the CHIPS Act report, [www.chips.gov](http://www.chips.gov) citing the percent of venture capital investment in semiconductors since 2001.

Numerous investors and analysts believe that the sector is suffering from a funding “moat” issue, which prevents capital from flowing in due to a lack of transparency and risk associated with semiconductors. More than funds, however, these companies need support and direction in their early years, which has been the mission of Silicon Catalyst since launching in 2015.

Hailing from Silicon Valley and with Partners based in Israel and England, Silicon Catalyst is the world’s only accelerator focused on semiconductor solutions. It provides access to funding, mentorship, and industry expertise to startups that create innovative technologies including Photonics, IP, MEMS, Sensors, and Life Sciences.

To date, Silicon Catalyst has screened over 800 startups and created a portfolio of companies worth more than \$1.5 billion. Silicon Catalyst also boasts an extensive network of 300+ investors and advisors who are semiconductor veterans with deep experience in the industry.

“Our investors and advisors help startups carve a path to success by providing guidance on business planning market fit, understanding the customer environment and building a winning team,” says Pete Rodriguez, CEO of Silicon Catalyst. “Companies in our accelerator receive millions of dollars of in-kind products and services, at no-cost or at a significantly reduced rate from their standard fees.



*The annual listing of 10 companies that are at the forefront of providing Photonics solutions and transforming businesses.*



**DAN ARMBRUST**  
CO-FOUNDER, DIRECTOR



**PETE RODRIGUEZ**  
CEO

This includes EDA licenses from Synopsys, IP from Arm and most importantly free MPW shuttle runs with TSMC. The net outcome is an acceleration of their business growth while saving them several million dollars.”

Silicon Catalyst is not just another accelerator. It takes a keen interest in every startup it selects for its acceleration program. That is why the company considers itself a partner that helps entrepreneurs turn their dreams into reality. “We’re extremely excited to have formed an alliance with Mayfield, the legendary venture capital firm for the semiconductor industry, as they will invest capital and provide mentoring to the majority of seed stage companies admitted to our accelerator,” stated Pete Rodriguez.

Other than investors and advisors, the firm has a thriving strategic partner ecosystem made up of big names in the semiconductor industry, including Arm, Bosch, NXP, Sony Semiconductor Solutions, ST, TI and collaborates with other accelerators, including Luminata, focused on optics, photonics, and imaging. Silicon Catalyst also has an array of partners - called In-Kind Partners (IKPs) - that offer highly discounted

*Our investors and advisors help startups carve a path to success by providing guidance on planning market fit, understanding the customer environment and building a winning team”*

goods and services for Silicon Catalyst to distribute to its startups that have joined their accelerator.

To add perspective, MathWorks is one of the more than 60 Silicon Catalyst IKPs that allows companies in the accelerator to use its products free of cost during the 24-month acceleration period. With such a strong network of advisors and partners, Silicon Catalyst has incubated companies that are fueling the next generation of semiconductor innovations.

Saliency Labs [www.saliencylabs.ai](http://www.saliencylabs.ai) is one such firm in the Silicon Catalyst 24-month program, that is building a hybrid photonic-electronic chip for AI. The startup is based on decades of research collaboration between Oxford University and the University of Münster, Germany. Silicon Catalyst has played a significant role in incubating the UK-based startup, giving it the much-needed exposure and resources to make its mark in the industry. The relationship panned out quite well for the startup, as it has now raised a



seed round of \$11.5 million to continue building high-speed multi-chip processors to accelerate exponential advances in AI.

Finding such innovative and capable companies is Silicon Catalyst’s primary focus. That is why the firm has helped launch the Silicon Catalyst Angels investment group, which provides seed and Series A funding to semiconductor startups. It has over 50 accredited investors who conduct comprehensive due diligence to select and provide early-stage investments to help the startups get off the ground.

Silicon Catalyst takes immense pride in its team of highly talented people that start from co-founder and former CEO, Dan Armbrust. He is one of the official members of the Industrial Advisory Committee of the Department of Commerce, as part of the CHIPS for America Act, that advises the White House on semiconductor innovation. It should be noted that Dan is a coauthor of a recently published 2-part article in the Georgetown Public Policy Review, “America’s lead in advanced computing is almost gone.”

The coming years for Silicon Catalyst will be exciting, to say the least. The firm has already expanded its footprint off shore, opening offices in the UK and Israel. It is also planning to increase its pool of acceleration programs to 250 startups by 2025. However, one thing that will remain unchanged, is the passion and determination of Silicon Catalyst to find promising startups and help them become the next big thing in the semiconductor industry.

**COMPANY**

Silicon Catalyst  
[www.siliconcatalyst.com](http://www.siliconcatalyst.com)

**HEADQUARTERS**

Silicon Valley, England and Israel

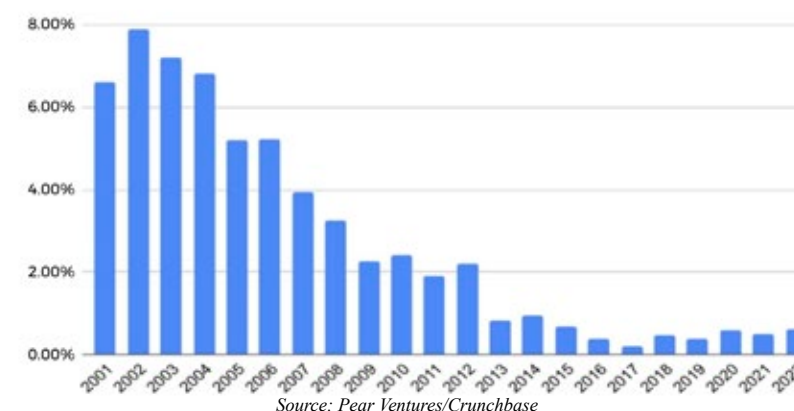
**MANAGEMENT**

Dan Armbrust, Co-Founder and Director  
Pete Rodriguez, CEO

**DESCRIPTION**

Silicon Catalyst is the world’s only accelerator focused on semiconductor solutions, including photonics, MEMS, sensors, IP, materials and life sciences.

**Percent total \$\$ raised by semiconductor start-ups**



**PORTFOLIO COMPANY NEWS** **SALIENCE LABS**



**CEO Interview: Vaysh Kewada**

May 20, 2022 by Daniel Nenni - SemiWiki.com

Vaysh Kewada is cofounder and CEO at Salience Labs, a company developing an ultra high-speed multi-chip processor that packages a photonics chip together with standard electronics to enable exascale AI. Salience is funded by Oxford Sciences Enterprise, Cambridge Innovation Capital, Arm-backed Deeptech Labs, former Dialog Semiconductor CEO Jalal Bagherli and former Temasek board member Yew Lin Goh. Prior to launching Salience Labs, Vaysh worked at Oxford Sciences Enterprises, a \$745M VC fund focused on deep-tech investments. Prior to that, she was a management consultant at McKinsey & Company. Vaysh holds an undergraduate and Masters degree in Physics from Imperial College London, where her thesis focussed on genetic algorithms.



Multi-chip processors – ones that package together several platform technologies – is that step-change, allowing us to package electronics together with silicon photonics, and to move compute from electronics to the realm of light. By using light to execute operations, it's possible to achieve massively parallel performance and deliver high throughput, low latency matrix maths – at the root of almost all AI applications. And it's possible to do this with clocking speeds in the 10s of GHz – where currently the limitation of even the most cutting-edge chips is just 2-3 GHz.

**WHY WAS SALIENCE LABS FOUNDED?**

Salience was founded with the vision of creating an exa-scale processor, by packaging a photonics chip together with standard electronics. The technology is based on decades of research at University of Oxford and Münster University in Germany.

The key inventors and researchers of the technology: Professor Wolfram Pernice, Professor Harish Bhaskaran and Dr. Johannes Feldmann, are co-founders in the company, giving Salience Labs significant depth of knowledge in this field.

**WHAT MAKES SALIENCE LABS TECHNOLOGY UNIQUE?**

While other photonic chip companies execute operations in the phase of light, we use a proprietary amplitude-based approach to photonics, resulting in modular, dense computing chips clocking at 10's of GHz. It also allows for high levels of parallelization, by using different wavelengths of light to send many calculations through the chip. Salience uses a multi-chip design, with the photonic processing mapping directly on top of the Static Random Access Memory (SRAM). This novel 'on-memory compute' architecture allows for the fast compute in the photonic domain to be fully utilized, delivering an

**TELL US ABOUT SALIENCE LABS?**

Salience Labs was spun out of Oxford and Münster universities in 2021 to commercialise an ultra-high-speed multi-chip processor that packages a photonics chip together with standard electronics. By using light to execute operations, we can deliver massively parallel processing performance – bringing ultra-high speed compute to a wide array of new and existing AI processes and applications.

The compute requirements of AI double every 3-4 months, as the world needs ever-faster chips to grow AI capability. The current semiconductor industry can't keep pace with this demand. What's required now is not further incremental innovations on transistor technology. If we are to realise the tremendous potential of AI, nothing short of a paradigm shift in the way we compute will do. One that delivers an immediate step change in performance and speed, while also offering a long-term future roadmap of scaling improvements.

exceedingly dense computing chip without having to scale the photonics chip to large sizes. This architecture can be adapted to the application-specific requirements of different market verticals, making it ideal for realising AI inference use-cases in communications, robotics, vision systems, healthcare and other data workloads.

**HOW HAS THE COMPANY EVOLVED SINCE YOU FOUNDED IT?**

We originally spun-out of the University of Oxford and the University of Münster in 2021 and have just closed our seed round of \$11.5 million from a number of leading VCs including Cambridge Innovation Capital, Oxford Science Enterprises and Arm-backed Deeptech Labs participating, plus some leading names in the semiconductor industry including former CEO of Dialog Semiconductor Jalal Bagherli and Yew Lin Goh. Since closing our seed round, our focus has been on the tape out of our next test chip, developing our software models and packaging solutions. We are also building relationships with customers across a range of market verticals.

**YOU ARE PARTICIPATING IN THE SILICON CATALYST ACCELERATOR PROGRAMME. WHAT HAS BEEN THE IMPACT ON THE BUSINESS?**

We joined the Silicon Catalyst programme in 2021, right after spinning out from Münster and Oxford Universities. The greatest benefit is the access it gives us to advisors

– individuals who have made a significant impact on the global semiconductor industry. In fact, we met our chairman Dan Armburst through the programme, who is a Silicon Catalyst Co-founder and Board Director. Through those advisors, we gained highly valuable commercial introductions to foundries, IP providers, and EDA providers at a very early-stage of the company. It has given Salience Labs' a commercial jump start. For example, we've just closed our seed round but we're already working with production level foundries on the fabrication of our next test chip. Silicon Catalyst has been a tremendous accelerator for our business.

**WHAT CAN WE HOPE TO SEE FROM SALIENCE LABS IN THE FUTURE?**

We're at a very interesting point in time where the industry is recognising the potential of multi-chip processors to solve the tremendous processing bottleneck currently hampering AI growth. Salience Labs' technology has the potential for breakthrough performance and power capability beyond what the established CMOS roadmap offers. We're talking to customers across a range of market verticals who are excited about the performance improvements silicon photonics will offer and the new AI processes and applications this will enable. We welcome any additional approaches from potential customers who are interested in understanding the capabilities of silicon photonics.



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