



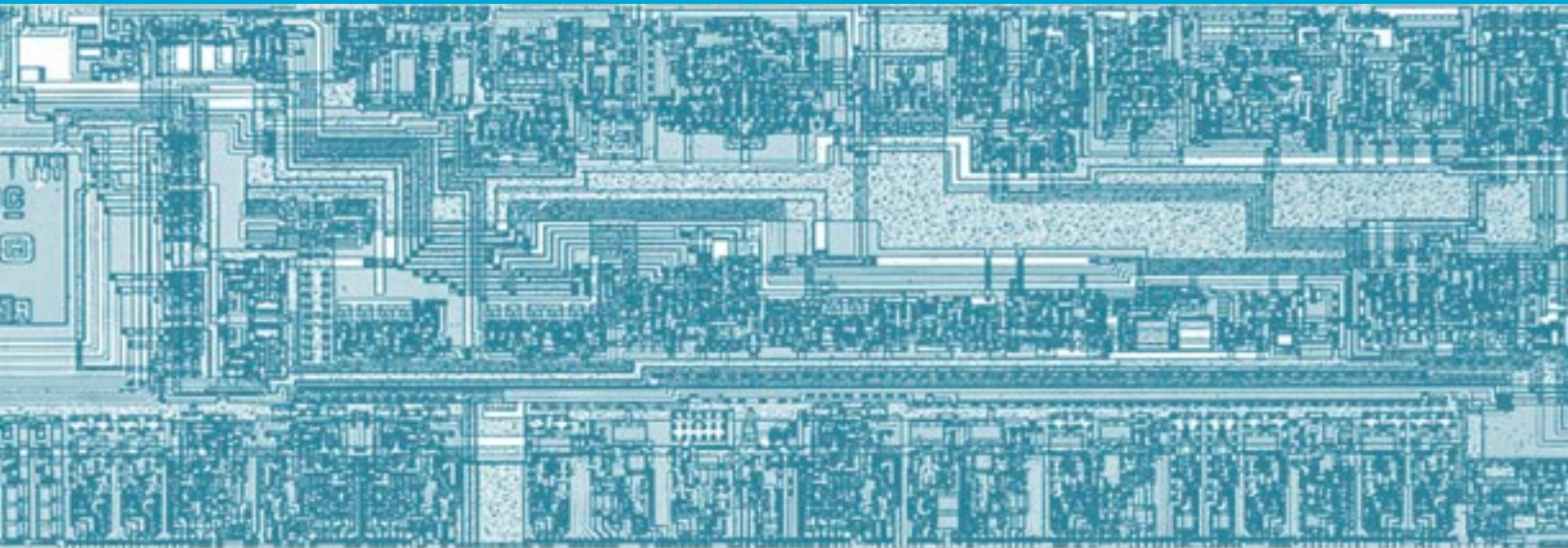
VOLUME 8 - APRIL 2019

SILICON STARTUP SOLUTIONS

it's about what's next.®

A SILICON CATALYST NEWSLETTER

A VALUABLE RESOURCE FOR THE SEMICONDUCTOR STARTUP COMMUNITY



www.siliconcatalyst.com



Portfolio Companies



ALUMNI



VOLUME 8

IN THIS ISSUE

Lance Bell - Partner

Where to begin? From Portfolio Companies, to Strategic Partners, to In-Kind Partners, to Advisors, to our first Semiconductor Industry Forum, to our ever-increasing ecosystem, to an incubator in China, the momentum continues. On the startup front, if you haven't heard, the Silicon Catalyst Portfolio Company alum, Ayar Labs, with their game-changing optical i/o, closed a \$24 million Series A round. Another Portfolio Company alum, AEAPONYX, closed a \$7.9CAN million Series A Round, Any startup considering applying to our incubator should reach out to AEAPONYX CEO Philippe Babin. He would extol the benefits reaped from the two year incubation period with us. Then there's Portfolio Company SPARK Microsystems.



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Esam Elashmawi joins Silicon Catalyst Board

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by Tekla S. Perry, IEEE Spectrum



Xceller CEO and CTO Gautam Kavipurapu, pitching at Venture University.

If being named to the EE Times Silicon 60: Startups to Watch weren't enough, SPARK Microsystems was the winner of the 6th annual Nokia Open Innovation Challenge for its revolutionary ultra-low power and ultra-short latency wireless platform. The winners were announced at the global headquarters of Nokia Bell Labs in Murray Hill, NJ.

January saw the grand opening of Silicon Power Technology in Chengdu, China, a joint venture with Silicon Catalyst. The incubator was established to identify and nurture China's most promising power semiconductor companies.

We are delighted to announce Soitec, a world leader in designing and manufacturing innovative semiconductor materials, as Silicon Catalyst's first European Strategic Partner. (see center spread article). Certis Semiconductor and Silitronics became new In-Kind partners and startups Espre Technologies and OWL Autonomous Imaging were admitted

as Portfolio Companies.

Five of our Portfolio Companies honed their presentation skills at Venture University in San Francisco, a multi-stage Investment Fund & Trade School for Venture Capital. Each of our startups delivered a compelling 20 minute pitch to the future VCs of the world. The experience and feedback was invaluable.

With regards to the startup pipeline, we had over 20 applications for our upcoming screening meeting, a record number.

Our Advisor network has grown to over 130, including some of the most eminent names in semi.

It is with sadness that we report the loss of our friend, and former Silicon Catalyst Advisor John Wharton the architect of the machine-language instruction set of the Intel 8051 micro-controller, one of the most widely used chips in history. He was a kind man yet quite the character. We will miss him.

WELCOME



CHAIRMAN'S CORNER RICK LAZANSKY

Co-Founder - Silicon Catalyst
serial entrepreneur
and incubator fanatic

April, 2019

[We're changing the world. Thank you all. Just one cautious note – "Does technology outpace wisdom?"](#)

I've been thinking of late about how investment has changed since the early 2000s, and why. The reason I've been thinking about it is when we started Silicon Catalyst, one of the mantras was "to make starting a hardware company as easy as starting a software company". It was a pretty obvious mantra to come up with, sufficiently catchy to grab someone's attention, and easy to remember. VCs had clearly shifted from hardware to software investments. We wanted to bring investment back – after all, software doesn't run on anything but hardware, and if it was really going to eat the world, then it had better have some good utensils to wolf it down. There were other reasons, too. Software performance was not improving much "on its own," and developers were still expecting "faster comes with very little effort" – the building blocks of software had taken a lot of the science out of computer science. Efficient code, in the big 'O' notation sense of Bachman-Landau, was simply assumed. The existence and availability of bigger pieces of the stuff for putting together an application had let developers be less concerned with

efficiency – the algorithmic parts had been subsumed in those bigger software components. It may have led to sloppier engineering, but it certainly was productive. Also, in the late 90's I'd been building a MEMs company, and was convinced there was a hurricane of innovative sensors that really were only about hardware and the software required was minimal. On this I was dead wrong. Clearly software had become cheaper to build. Semiconductors were becoming more expensive, in the design and engineering, and even perhaps by the transistor, at least in the sense that a lot more of those were being thrown at scaling performance and capacity, and rather incautiously at that. So the problem was to apply whatever made development of software cheaper to making hardware cheaper too. OK, there were some obvious differences. Hardware took longer, required more capital expenditures (preferably by someone else). The founders of hardware startups were likely older, and presumably slept in beds at homes that had mortgages to pay, rather than under their desks at work which might even be at an incubator with a dubious business model, or better yet, dining room tables at their parents' homes. The goods and services that were needed could be negotiated for startups which we could all agree on as being certainly worth sponsoring. And it has, thanks to our in-kind partners. We could even see the big opportunity – hardware might even become more 'open source' just like software for the commodity like IP components. And it has. Thanks to projects like RISC V, and far more. So maybe the chasm between cost and time of hardware versus the cost and time of software could be narrowed - a lot. We've done that.

So what did we miss? Something rather huge. It wasn't all about

reducing costs. When you all first began to build hardware the premise was to build something that had, well, margin. It should sell for more than it cost to build, summed up well in one word – 'Profit'. Investors were looking for entrepreneurs that wanted to build profitable businesses. But along the way, we all quietly started to use 'growth' as software took center stage. And this, too, changed. 'Growth' is now officially replaced by 'Acceleration'. Keep that progression in mind "Profit g Growth g Acceleration". It's the mantra of investing in software. And if we want hardware to compete with software more effectively for the attention of investors, we can either wait for a return to the way things used to be (a very bad idea, certainly) or we can figure out how to focus on growth and acceleration. To date, the Silicon Catalyst answer has been to recommend solutions. Going more vertical usually means capturing the benefits unlocked, reducing the margin stacking. This might be by adding software, owning the data the solution collects, providing hardware as a service. This is going to be harder for hardware than software. Software cheats. Growth doesn't have to be measured in currency, eyeballs are equally interesting to investors. Software companies really fudge on acceleration – some decks don't even talk about what it is that's accelerating – growth of 40% month to month suffices as a description. We're not yet in the right dialog without borrowing from software here as well. So there is the problem laid bare – Investors are looking for your acceleration story, and I suspect that yours is as yet unwritten. I cheated as well. You may have noticed that I've not mentioned the question of technology outpacing wisdom, much less answered it. I'd like instead to invite you to share your thoughts on that, and maybe we can crowdsource the next quarterly.

IN-KIND PARTNER PROFILE A.M. FITZGERALD & ASSOCIATES, LLC



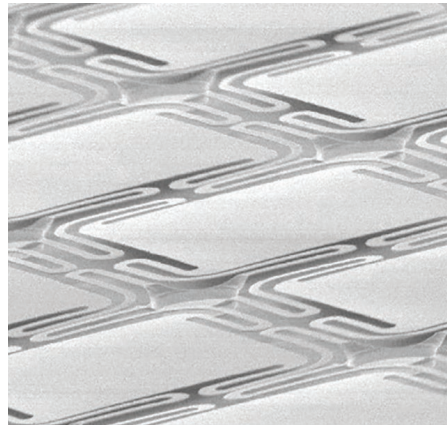
Interview with Founder, Dr. Alissa M. Fitzgerald

Q. PLEASE TELL US ABOUT YOURSELF AND YOUR COMPANY?

A. A.M. Fitzgerald is a full service MEMS and sensors development company. Our customers use MEMS and sensors to differentiate their products in high value markets such as medical devices, scientific instruments, industrial equipment, and aerospace vehicles. We work with companies at every stage of product development, from concept design through volume manufacturing. We're known for our achievements in new silicon device design, process integration and prototyping. I founded the company in 2003, bootstrapped it and grew it from its profits, without using any external funding or government grants. Although I initially intended the company to offer only design services, after pitching lots of customers, I very quickly learned that design would not be enough, the customers also needed MEMS wafer prototyping services. Fortunately, I had years of hands-on wafer fabrication experience as a graduate student and could provide those services using a local university fab. Prototyping is still one of our main services in the company today.

Q. WHAT IS YOUR SPECIFIC ROLE/TITLE AND BACKGROUND?

A. Today, my role in the company is advising our customers on technology, business and operations



SEM photo of a prototype uncooled long wavelength infrared bolometer. A.M. Fitzgerald designed the pixel array and fabricated it on top of a CMOS photodiode wafer.

strategy. As CEO, I'm also responsible for growing the business and managing our client relationships. I started my career as an aerospace engineer, working at JPL on aircraft-based scientific instruments and then in the aerospace industry on rockets and spacecraft. I stumbled upon MEMS and semiconductors while pursuing a Ph.D. at Stanford University and was drawn to its multi-disciplinary nature and opportunity for innovation. (I like to joke that I changed my career from "outer space" to "inner space".) After graduating, I worked at a MEMS ultrasound startup for several years, and then finally got the nerve to leap into entrepreneurship. I had done some consulting work during graduate school to help pay the bills and had really enjoyed it, so that motivated me to launch a services business.

Q. WHAT TRENDS ARE YOU SEEING IN YOUR SECTOR?

A. Lately, many of our customers are focused on silicon-based gas and particle sensors for environmental sensing applications. Microphones and speakers, and ultrasound transceivers, for applications ranging from smart phones to medical devices, are also popular now. This past year, we saw a spike of interest in MEMS micro-mirrors for LiDAR applications, motivated by the compelling future market for autonomous vehicles. It's a little bit of déjà vu for us: there was a similar frenzy of investment in micro-mirror technology nearly 20 years ago. At the time, the intended end use market was fiber optic networking in support of the dot-com boom. A lot of IP and technology was created at that time, about 15 years too early for the market.

Q. WHY ARE YOU PARTNERING WITH SILICON CATALYST?

A. We were really inspired by the mission and model of Silicon Catalyst, to give startups access to expensive, specialized resources. Our company significantly benefits from the shared facility model at the UC Berkeley Marvell Nanolab, so we deeply understand the importance of the Silicon Catalyst model and know it can be a game changer for silicon-based startups.

IN-KIND PARTNER PROFILE A.M. FITZGERALD & ASSOCIATES, LLC



Interview with Dr. Alissa M. Fitzgerald continued...

Q. WHY SHOULD OTHER COMPANIES PARTNER WITH SILICON CATALYST?

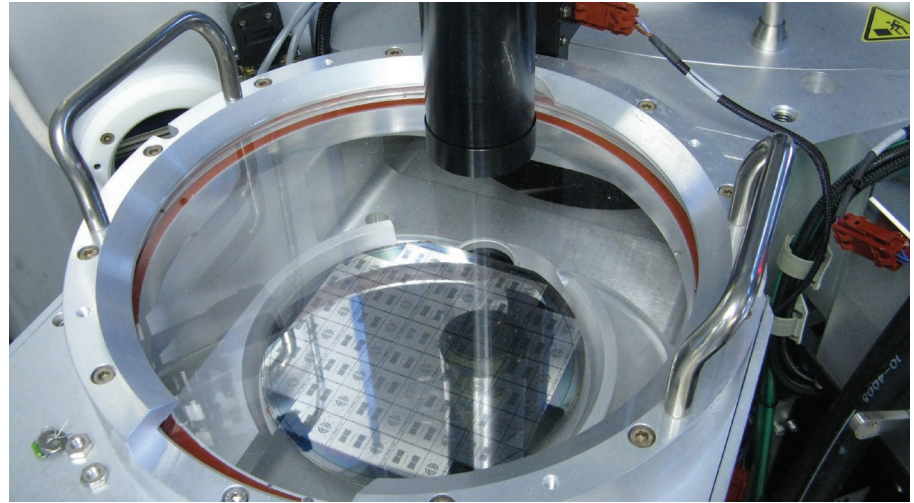
A. As an industry, we need to nurture new ideas and new people to prevent stagnation and commoditization. Silicon Catalyst provides a simple and low cost way for companies to really help the next generation of innovators and entrepreneurs succeed. Partner companies, in turn, get to meet talented engineers and be introduced to their new technology.

Q. WHAT HAVE YOU LEARNED IN WORKING WITH SILICON CATALYST AND OUR PORTFOLIO COMPANIES?

A. The Silicon Catalyst community is excited about and deeply dedicated to promoting new silicon technologies. Many prominent members of our field are happily volunteering their scant time to help Silicon Catalyst and its portfolio companies succeed.

Q. WHY IS IT IMPORTANT FOR YOU TO WORK WITH STARTUPS?

A. We know first hand how hard it is to succeed in the silicon business, and now we're in a position to give startups a helping hand. We know we can help them save a lot of time and money by providing our expertise at a critical time in their development.



A wafer of prototype electrostatic actuators, developed by A.M. Fitzgerald, undergoing a deep reactive ion etch trimming process.

Q. WHAT RECOMMENDATIONS DO YOU HAVE FOR SEMICONDUCTOR ENTREPRENEURS?

A.

- 1) Seek out our industry's elders and listen to their advice. It's a tricky, expensive business and the veterans will be more than happy to show you how to avoid pitfalls (and amuse you with stories of their crazy experiences).
- 2) Think globally. The silicon business is a global business, with talent spread across many countries. When looking for partners, facilities, materials and talent, don't limit yourself to local options. Video chat, web conferencing and FedEx make the planet a smaller place for doing business.
- 3) Practice the silicon version of "measure twice, cut once": Simulate

as much as possible to reduce the number of fab cycles. Fabbing silicon is hugely expensive and time-consuming, so do as much advance work on a computer as possible.

Q. WHAT DO YOU THINK THE ROLE IS OF STARTUP INCUBATORS LIKE SILICON CATALYST?

A. You can't build a silicon-based technology in a garage. Silicon Catalyst has a unique role to provide startups with something harder to get than money: access to top experts, tools and facilities.

Q. WHAT ARE YOUR GOALS FOR 2019 WITH SILICON CATALYST?

A. We'd like to see more MEMS startup companies apply to Silicon Catalyst and work with one of them.

A CONVERSATION WITH SILICON CATALYST PORTFOLIO COMPANY OWL AI, CO-FOUNDED BY CHUCK GERSHMAN WHO HAS 30 YEARS OF SEMICONDUCTOR INDUSTRY EXPERIENCE.



Owl AI's Always on Thermal Ranging™ 4D-camera delivers precision ranging with 100x the resolution of LiDAR cameras, operates day & night, in all weather, definitively classifies: pedestrians, cyclists, animals and vehicles (either moving or stationary) all the while calculating position, direction and speed (true 3D-velocity) to enable safe driverless cars.

Q. PLEASE TELL ME ABOUT YOUR STARTUP AND GOALS?

A. For Automotive OEMs and their Tier 1 suppliers, Owl Autonomous Imaging (Owl AI) designs, develops and sells the world's only 4D solid-state camera delivering HD thermal video with high precision ranging. Our camera is a critical safety component for autonomous vehicles.



CHUCK GERSHMAN, PRESIDENT/CEO AND CO-FOUNDER OF OWL AI

Our short-term goals are very focused. One, we need to secure sufficient capital to realize an Automotive A Sample camera. Two, we need to execute on a timely delivery of said camera. Once we achieve these short-term goals we can focus on the next steps for growth of our company.

Q. PLEASE TELL ME ABOUT YOUR SPECIFIC ROLE/TITLE AND BACKGROUND?

A. I am the President/CEO and co-founder of the Owl AI. My role today is to lead our fund-raising efforts, continually evolve our messaging, manage timely execution, engage customers, recruit, and ensure that the entire company believes our vision and understands our goals while we are all working toward the same ends without ambiguity. Finally, it is my role to ensure that we are all myopically focused on our goals.

Q. WHAT INSPIRED YOU TO START THIS COMPANY?

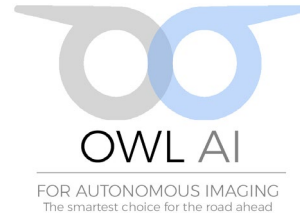
A. I have been part of a number of other startups in roles ranging from executive staff to CEO including as a co-founder of a number of these companies. I enjoy the challenge and the excitement of bringing something completely new to market. I am a semiconductor guy at heart having been in the industry for nearly 30 years and I have a well-defined understanding of what elements need to be in place for a semi startup to have maximum opportunity for success. When Gene Petilli, my co-founder, and I began putting the component pieces together for Owl AI all of the key elements fell into place perfectly. We checked every box. We were aware that the market potential was massive. However, even with all the

key elements in place it was not enough for me to feel comfortable to commit. For that we had to hear from customers. We spent four months talking to customers, vetting our concept and gathering feedback. We needed to hear that we solved a real-world existing vexing problem, that our solution was disruptive, and our technology was defensible. And most importantly, customers wanted to buy it. When we sat in a 5th meeting with one of the world's largest automotive suppliers, their key autonomous technical lead told us that if we execute against our product slide deck, we would disrupt the entire sensor industry, I was sold. We cranked it up and have been running full speed ever since.

Q. WHY ARE YOU PART OF SILICON CATALYST?

A. There are numerous reasons for being a part of Silicon Catalyst; endorsement, validation, encouragement, professionalism, and industry credibility are all key factors. However, at the end of the day there is simply no substitute for being able to surround yourself with A+ players and experience. Silicon Catalyst people are all A+ players and they work tirelessly to associate themselves with other A+ players through their extensive advisor network. It is fool hearty to think you can go it alone. We are never alone. We are backed by some of the best minds in Silicon Valley with invaluable experience.

A CONVERSATION WITH SILICON CATALYST PORTFOLIO COMPANY OWL AI CONTINUED ...



Q. WHAT INSPIRED YOU TO START THIS COMPANY?

A. I enjoy the challenge and the excitement of bringing something completely new to market.

Q. WHAT HAVE YOU LEARNED IN THE PAST YEAR?

A. It never gets any easier. You may be wiser. You may be able to leverage your experience to foresee impediments. You may be better at decision making. All these things may help to reduce churn and create better efficiencies but nevertheless doing a startup is still hard. I may be able to better anticipate investor questions, needs and risk profile, but it does not get any easier to sell them.

Q. WHAT ARE YOUR GOALS FOR 2019?

A. Simple, close our seed financing, deliver our first A Sample prototype, then close our first tier 1 customer.

Q. WHAT RECOMMENDATIONS DO YOU HAVE FOR SEMICONDUCTOR ENTREPRENEURS?

A. Semis can cost a lot of money to prototype and they can take a long time relative to other products to realize a first prototype. These factors all make doing a semi startup hard. All these factors make investors squeamish and that's not good. Consequently, make sure you meet these criteria; a multi-billion-dollar market opportunity, solution is at least one order of magnitude better (two orders are better) than the status quo, surround yourself with the best of the best, and make sure your solution is disruptive. Most importantly, never

ever fall in love with your plan of record. Know your assumptions, and always be testing your assumptions. You must be willing and able to pivot when you discover that one or more of your assumptions does not hold true. If you don't pivot when necessary you are potentially setting your employees, your investors and yourself up for failure.

Q. WHAT IS IT LIKE AS A STARTUP WORKING IN A CROWDED AND HOT SPACE?

A. My metaphor for startup investing is that investors follow waves. It is hard to surf if you do not have a wave to ride. Well the same holds true for startups. You need to catch a wave. The problem is as the wave gets bigger more companies jump on and the space becomes both hot and crowded. But that's the challenge. Before you catch the wave, you have to make sure you can differentiate yourself from the competition and that is where things get tricky. If multiple companies are addressing the same problem space, at the highest level of messaging, they may all look very similar or even the same (I experienced this very dilemma at a previous company). It is imperative that your company can demonstrate a solution and then message that solution as different and compelling from your competitors. I refer to this as the company's Unique Disruptive Value Proposition. A further caveat, can you make this unique capability so compelling that your customers can leverage it to differentiate

their resulting product with their customers. This is ultimately what you are shooting to achieve. Sometimes, especially with semiconductors this can be very hard as your differentiation may be unique, but it is highly technical or even a bit esoteric and buried deep within your chip.

At Owl AI, we are well aware of the crowded space dilemma. The sensor market with specific regard to LiDAR is very hot, very crowded and very well-funded. We have positioned ourselves through both our solution and our messaging to be complementary to LiDAR only companies. Owl AI's unique disruptive value proposition is called Always-On Thermal Ranging™. Our solution is unique in that it is the only camera that delivers 4-dimensional video imaging (X,Y,Z, including Thermal Intensity) and we do it night and day in any weather condition (rain, snow, sleet, fog, or exhaust). Furthermore, Owl AI can definitively classify living objects from non-living objects. None of the crowded space of competitors can make these assertions. We have over 100x the resolution of a LiDAR or RADAR camera. Moreover, visual cameras are simply not suited for safe operation in foul weather and visual camera performance is significantly degraded at night. Simply stated, these other cameras go blind or have significant blind spots in their operation. Owl AI does NOT. As such we are unique, differentiated, patent protected, and we offer a solution that addresses a gap in the problem space previously unsolved by our competitors. A winning combination.



EVENTS



**04.24.2019
SILICON CATALYST
SPRING ADVISOR EVENT**

Menlo Park, CA

**06.02-06.2019
DESIGN AUTOMATION
CONFERENCE**

Las Vegas, NV

**08.07.2019
SILICON CATALYST
SUMMER ADVISOR EVENT**

Silicon Valley, CA

**11.13-14.2019
SILICON CATALYST
FALL PORTFOLIO
UPDATE MEETING**

Silicon Valley, CA

**05.12-13.2019
CHIPEX**

Tel Aviv, Israel

**05.29-30.2019
SILICON CATALYST
SPRING PORTFOLIO
UPDATE MEETING**

Menlo Park, CA

**07.09-11.2019
SEMICON WEST**

San Francisco, CA

**09.18.2019
SILICON CATALYST
FALL SCREENING EVENT**

Silicon Valley, CA

**12.04.2019
SILICON CATALYST
WINTER ADVISOR EVENT**

Silicon Valley, CA

**12.09-11.2019
INTERNATIONAL
ELECTRON DEVICES
MEETING**

San Francisco, CA

2019



SOITEC BECOMES STRATEGIC PARTNER OF SILICON CATALYST START-UP INCUBATOR A DISCUSSION WITH DR. THOMAS PILISZCZUK EXECUTIVE VP OF GLOBAL STRATEGY FOR SOITEC

Soitec (Euronext, Tech 40 Paris) is a world leader in designing and manufacturing innovative semiconductor materials. The company uses its unique technologies and semiconductor expertise to serve the electronics markets. With more than 3,000 patents worldwide, Soitec's strategy is based on disruptive innovation to answer its customers' needs for high performance, energy efficiency and cost competitiveness. Soitec has manufacturing facilities, R&D centers and offices in Europe, the U.S. and Asia.

Silicon Catalyst, the world's only incubator focused exclusively on accelerating solutions in silicon announced Soitec (Euronext Paris), a world leader in designing and manufacturing innovative semiconductor materials, as its first European Strategic Partner.

The Strategic Partnership Agreement with Silicon Catalyst provides Soitec access to early-stage silicon technology innovation targeting



consumer, IoT and automotive segments and applications. Silicon Catalyst provides silicon focused start-ups access to a world-class network of advisors, design tools, silicon devices, networking, access to funding and marketing acumen needed to successfully launch their businesses.

By joining as a Strategic Partner, Soitec will engage in this start-up ecosystem to gain insight into the newest technologies and applications across high-growth markets, and to guide nascent technologies to successful market penetration. "As a Strategic Partner of Silicon Catalyst, Soitec has a unique opportunity to grow our visibility among early-stage semiconductor companies," said Thomas Piliszczuk, Executive Vice President of Marketing

and Business Development for Soitec. "Engineered substrates give semiconductor related start-ups a competitive edge in developing new high-performance, energy-efficient solutions. We are looking forward to supporting emerging trends and technology advancements with Silicon Catalyst's distinguished portfolio of semiconductor entrepreneurs."



Silicon Catalyst joins Soitec and several of the world's leading technology companies as a member of the SOI Industry Consortium, the leading industry organization representing the complete SOI based microelectronics value chain: fabless, EDA/IP/design, foundries, supply chain, etc.



SOITEC CONTINUED ...

Portfolio of Engineered Substrates to deliver superior value into device performance



Soitec Engineered Substrates Offer Endless Opportunities for Innovation

Soitec's objective is to develop products that become industry standards, and to do so, it seeks to work with partners across the entire semiconductor ecosystem from the very early stages of product development. As such, Soitec is very excited to work with Silicon Catalyst to be able to contribute to and support this early-stage platform and companies. Smart Cut™, Soitec's proprietary wafer-bonding and layer-splitting technology, enables any thin film materials to be transferred on top of any other materials while maintaining initial crystallographic properties. This technologies toolbox also provides the electronics industry with new opportunities for innovation and differentiation in growing and emerging fields including sensors (image sensing, MEMS pressure sensors, etc.), flexibles electronics, wearables, 3D applications, new materials (high-mobility, carbon nanotubes, graphene) for advanced processing, wireless communication (5G, mmWave), energy harvesting, and LEDs, etc.

Soitec's portfolio of engineered substrate solutions, most notably silicon-on-insulator (SOI), are designed to answer its customers' needs for high performance, energy efficiency and cost

competitiveness. Radio-frequency silicon-on-insulator (RF-SOI) substrates are the foundation of the RF incumbent technology for RF Front-End modules used in all smart phones manufactured today and its surface is growing with each new product generation. Fully Depleted Silicon-On-Insulator (FD-SOI) technology provides the best balance between digital performance, mixed-signal compatibility, power consumption and cost. RF-SOI and FD-SOI material enable ultra-low power connectivity, mobility, distributed AI and edge computing. Soitec Power-SOI products address the requirements for integrating high-voltage and analog functions in intelligent, energy-efficient and highly reliable power IC devices, for automotive and industry markets. Soitec Photonics-SOI wafers enable standard CMOS fab to produce optical transmitter and receiver chips, providing high-data rate and cost-effective solutions for data center interconnections of 40Gbps and beyond. Adding new compound and piezo-electric on insulator substrates, Soitec offers a wide range of engineered substrates addressing

numerous and fast-growing segments like automotive, AI-IoT (AIoT) and 5G. Today, Soitec facilities in France, Singapore and China have a total yearly production capacity of 1.3 million (200 mm wafers) and 1.6 million (300 mm wafers).



Dr. Thomas Piliszczuk

Dr. Thomas Piliszczuk has 30 years of experience in the Semiconductor industry. He joined Soitec in 2009 as Vice President and has held positions managing Worldwide Sales, Marketing and Business Development and Global Sales. Since September 2018 he is responsible for leading Soitec's Global Strategy. Dr. Piliszczuk holds a Ph.D. from the Ruprecht-Karls-Universität Heidelberg in Germany, an Electrical Engineering degree from the Gdansk Polytechnic University in Poland and an Executive Business degree from Stanford University.

LESSONS FROM 5,000 BOARD MEETINGS

by Larry Chao, PhD - Partner



James Hogan,
Silicon Catalyst Board Member



Pete Rodriguez,
CEO of Silicon Catalyst

Silicon Catalyst recently had the honor of hosting a conversation with long time startup investors and entrepreneurs James Hogan and Pete Rodriguez with our portfolio companies around running board meetings. Between the two of them, they have attended thousands of board meetings as an entrepreneur, board member, or investor. I've summarized some of the practices that they've shared with us.

WHEN TO ENGAGE WITH THE BOARD

Most VC's will require board meetings at least once a quarter and it's good to schedule those out ahead of time. However, it is important to recognize that board meetings should not be an operational meeting but rather a forum to show and justify your plan. It is also important to make sure that there are no surprises revealed at the board meeting. If there is any important news, you should try to meet with every director/investor at least two weeks prior to the board meeting.

Our speakers also suggested making the board package presentation materials available at least two days before the day of the board meeting so that the board members have time to review the materials. Also, always include the teleconference (e.g., Zoom, Webex) dial-in information on the first page of the board package so there's no wasted time looking for that information.

MEETING LENGTH AND TIMING

Board meetings can vary quite a bit in length. Our speakers have had experiences with board

LESSONS FROM 5,000 BOARD MEETINGS continued ...

MEETING AGENDA

A typical board meeting should start with the CEO giving a summary of the company, speaking on the recent highs and lows, the state of the industry, and dashboards summarizing the company performance. For a one day meeting, a typical agenda could be something like:

- | | |
|---|---|
| <ul style="list-style-type: none"> • CEO's High and Lows (9am-9:30am) • Industry Highlights (9:30am-10am) • 2019 Dashboard (10am-10:15am) • Break (10:15am-10:30am) • Sales and Marketing (10:30am-11:15am) • Research & Development (11:15am-noon) | <ul style="list-style-type: none"> • Lunch/Discussion (noon-1pm) • Administration and Financials (1pm-1:45pm) • Approvals (1:45pm-2pm) • Closed Door discussion (2pm-3pm) • Dinner (6pm) |
|---|---|

It is important to give the board members time to speak without the startups management team, including CEO, present. This time should be spent for these board members to sit down as a board and talk about what went well and what didn't go well. Usually, one board member then should provide concise feedback to the CEO directly after the event.

If the board does not want a full day meeting, our speakers suggested spending less time on marketing and R&D, but the finance and sales are always key to include. Another good practice is if you have many board member flying in from remote areas, it might be good to schedule dinner for the night before as they might fly in the night before as well as allowing them to fly back out the next evening.

meetings that have lasted as little as 10 minutes to as long as multiple days for public companies. Generally speaking though, a board meeting should allocate around 3-5 hours. Typically, earlier stage companies can probably be fine with 3 hour meeting while revenue growth phase startups might look at more like a 5 hour event. Our speakers recommend generally having a late afternoon/early evening meeting for a 3-hour long early stage board meeting with dinner brought in. On the other hand, if you are looking at something 5 hours or more to plan for a meeting that starts in the morning and runs into the afternoon with lunch brought in.

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members time to speak without the startups management team, including CEO, present. This time should be spent for these board members to sit down as a board and talk about what went well and what didn't go well. Usually, one board member then should provide concise feedback to the CEO directly after the event.

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as allowing them to fly back out the next evening.

ATTENDANCE

It is important for the CEO to share the load for this board meeting and bring their management team into the board meetings with them. The team should not only help the CEO put together the content for the board package but potentially even present their sections themselves. Particularly, the HR executive should talk about the hiring plan as well as share their insight about the organizational health, and the CFO/finance executive should present the balance sheet and answer any accounting/finance questions.

GRAND OPENING JANUARY 17, 2019



ANNOUNCING THE GRAND OPENING OF SILICON POWER TECHNOLOGY IN CHINA

Industry Luminary David French and Silicon Valley's Silicon Catalyst partner to launch Incubator for Power Semiconductor Startups

Chengdu, Sichuan Province, China
January 17, 2019

Today marks the official opening of Silicon Power Technology, an incubator established to identify and nurture China's most promising power semiconductor companies. Silicon Power Technology is located in the Chengdu High Technology District, based in a newly established incubation center with capacity for up to 20 startup companies in the 2,400 square meter office space. The Silicon Power Technology Incubator offers qualified startup teams and early stage companies comprehensive In-Kind Partner (IKP) and advisory services spanning new materials, design, foundry, packaging & test, technical and marketing planning, sales as well as financing and administrative support.

"The China semiconductor market in general, and the power



semiconductor market particularly, is accelerating at a very fast pace. Investment in new fabs is at an all-time high. Despite this, the development and training of talented technologists and semiconductor business management lags the market. Our partnership with Silicon Catalyst will allow us to leverage

their successful incubation model for startups in China," stated David French. "The Silicon Power Technology mission is to provide a complete ecosystem to support, encourage, train and motivate the most talented power semiconductor entrepreneurs and startup companies to achieve market success."

The Power Semiconductor sector is a critical sector for China's overall growth in multiple markets, including the New Energy automotive sector, the continued development of high-speed trains and subways, the expansion of the country's power distribution network and the continued development of the consumer white goods and enterprise industrial sectors. "The long-term

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SILICON POWER TECHNOLOGY CONTINUED ...

objective is to combine our Silicon Power Technology's incubator with Chengdu's UESTC PITEL power semiconductor expertise to form an innovation cluster for power semiconductors, with both national and international recognition," stated Jesse Parker.

Silicon Power Technology Details

The Silicon Power Technology incubation process is based on the successful model pioneered by Silicon Catalyst LLC, a Silicon Valley incubator that has been working with early-stage semiconductor startups since 2015. The Silicon Catalyst incubator is solely focused on "Solutions in Silicon", combining key semiconductor



industry vendors, strategic partners, investors and advisors, creating a robust ecosystem to assist in transforming technical concepts and prototypes into successful businesses.

"We are extremely pleased to partner with Silicon Power Technology and their world-class team as they utilize our successful incubation process to foster startups in China. The opportunities for innovation are significant in the critical area of power semi's, especially for consumer, industrial and automotive applications," stated Pete Rodriguez, CEO of Silicon Catalyst.

Silicon Power Technology will screen startups for admission to the incubator after review by the Portfolio Review Board (PRB). The PRB will evaluate the startups' plans on a number of aspects: Team Quality, Differentiated Technology, Market Opportunity and Financial Return. Startups accepted to the Incubator will typically be admitted for a 24-month period, gaining access to Silicon Power Technology's IKPs and advisor network.

Silicon Power Technology has established strategic partnerships with a variety of organizations to create a powerful network of In-Kind Partners. The initial list of IKPs include:

- China Resources Microelectronics (CRM) for foundry, testing and packaging support
- Cadence Design Systems for leading-edge electronic design automation tools
- Silvaco for power-specific design automation tools (TCAD, SiC, GaN)



- UESTC PITEL for technology advice and support
- HiWAFER for GaAS and GaN foundry support
- Chengdu ICC Service Center for testing and rapid packaging services
- Shanghai Zixin Semiconductor for Marketing and Sales support
- China Merchants Bank for banking services and TaiHeTai Law Firm for legal services

The Silicon Power Technology management team includes:

- David French – Silicon Power Technology Chairman and semiconductor industry luminary with more than 40 years of experience in the analog semiconductor market and extensive expertise working with high-technology companies and investors based in China
- Jesse Parker – Silicon Power Technology General Manager and China veteran with more than 25 years of experience living and working in China, focused on semiconductor investment and the development of early stage companies.

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SILICON POWER TECHNOLOGY CONTINUED ...

“CRM is very excited to partner with Silicon Power Technology. We value the opportunity to identify and work with the most promising startup teams in the power semiconductor sector. CRM’s partnership includes providing foundry services and technology advice to Silicon Power Technology’s portfolio companies,” said Mr. Chen NanXiang, Executive Vice Chairman of CRM.



has been established in Chengdu to promote Chengdu as a power semiconductor development center in China,” said Professor Zhang Bo.

Silicon Power Technology Portfolio Companies Announced at Grand Opening

The Silicon Power Technology PRB has been actively screening a number of early-stage startups and is

pleased to announce the first two companies accepted for admission to the Incubator:

Strategic Advisors include (among others) China semiconductor industry experts:

- David French, Chairman Silicon Power Technology Ltd and GaoZhan Consulting Ltd
- Professor Zhang Bo, UESTC PITEL and Silicon Power Technology Advisory Board Chairman
- Pete Rodriguez, CEO Silicon Catalyst
- Professor Ye Tianchun, Microelectronics Institute, Chinese Academy of Sciences

- Mr. Chen NanXiang, CRM Executive Vice Chairman
- Mr. Huang Xueliang, General Partner Hong Tai Investment Fund
- Mr. Gao Nengwu, CEO HIWAFER
- Mr. Zhang Jingyang, Mooreelite.com CEO

“The establishment of Silicon Power Technology’s power semiconductor incubator provides entrepreneurs a comprehensive base from which to develop their startup companies. We are excited that such a platform

• Chengdu Blue Silicon Technology Ltd – Blue Silicon Technology designs and sells competitive MOSFET and IGBT products designed by its engineering team and its supply chain partners.

• AmagineTech Ltd – Founded by a talented engineering team, AmagicTech will design and sell analog chipsets for the battery management sector.

About Silicon Power Technology

Silicon Power Technology is a Sino-foreign joint venture company based in Chengdu, Sichuan Province, China. Established in August, 2018, Silicon Power Technology’s power semiconductor incubator identifies and supports the most promising power semiconductor teams and early stage companies. Silicon Power Technology’s comprehensive power semiconductor ecosystem is comprised of essential domestic and international partners aligned to assist its companies. Silicon Power Technology welcomes promising startups and early stage teams and companies to apply for admittance to its incubator. More information can be found at www.sipowervalley.com.

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PROFILE

SEMICONDUCTOR INDUSTRY EXECUTIVE ESAM ELASHMAWI JOINS SILICON CATALYST BOARD

Silicon Catalyst is pleased to announce that Esam Elashmawi, Chief Marketing and Strategy Officer of Lattice Semiconductor Corporation (NASDAQ: LSCC), has been appointed to its Board of Directors.

Esam Elashmawi brings to the role 30 years of semiconductor and equipment technology, and industry experience. Over the past decade, he has successfully managed and developed solutions and equipment for the datacenter, automotive, defense, communications and industrial markets.

"I'm extremely pleased to have Esam join our board, as our incubator has grown significantly over the past few years, now covering a wide range of startups targeting a broad variety of technologies, market segments and geographic regions. Esam's business acumen, global experience and in-depth executive level expertise in the semiconductor industry will be invaluable to our strategic planning and international expansion plans," said Pete Rodriguez, CEO of Silicon Catalyst.

Prior to his recent appointment at Lattice, Esam served as Senior Vice President and General Manager at Microsemi Corporation since 2010 responsible for their datacenter, timing solutions and programmable

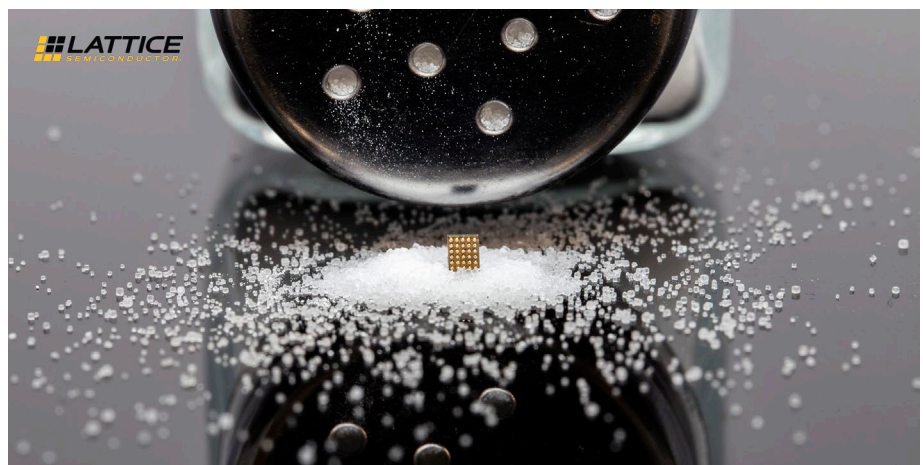


Esam Elashmawi,
Silicon Catalyst Board Member

logic product lines. Mr. Elashmawi previously served as Vice President of Product Development at Actel Corporation, which Microsemi acquired in 2010. Earlier in his career he co-founded SiliconExpert

Technologies, a component management software company, which was acquired by Arrow Electronics. He holds a Master of Science in Electrical Engineering and a Bachelor of Science in Electrical Engineering from Santa Clara University.

Esam Elashmawi stated, "My involvement in the semiconductor industry has afforded me an opportunity to manage and develop numerous initiatives to drive business growth, at both public and private electronics companies. I'm excited to be joining the board at Silicon Catalyst at this point in time, as it will enable me to remain active in the semiconductor startup scene and to contribute to the on-going selection process and nurturing of the companies admitted to the Silicon Catalyst incubator."



SEMICONDUCTOR INDUSTRY VETERANS SEE THE OLD ORDER CRUMBLING

by Tekla S. Perry, IEEE Spectrum

[In their crystal ball, they see memories moving to China, Intel building its last fab, and design - not process - innovation stepping up to save the U.S. semiconductor industry](#)

What will the semiconductor industry look like in 2024? That's the question Pete Rodriguez, CEO of semiconductor startup incubator Silicon Catalyst, asked a panel—and a roomful—of industry veterans earlier this month. And few were shy about predicting dramatic and, for some companies, potentially catastrophic changes.

The last new fab on earth ... or at least in the U.S.

After conceding the future of DRAM to China, the group took a look at the process innovations that have driven node sizes down to 7 nanometers and kept the companies that developed them in the game. That path, they indicated, is coming to an end.

“What does it cost to build a fab? Fourteen billion. How much cash does Intel have now? Fourteen billion. So they have just one more shot at this.”
-Jim Hogan

Today, said Silicon Catalyst's Rodriguez, only “three companies are doing 7 nm or below: TSMC, Samsung, and Intel [which is] a distant third. Only three companies in the world can afford it; working at the leading node is very expensive.”

Intel, suggested Hogan, might not be in the game for much longer. “What does it cost to build a fab?” he asked. “Fourteen billion. How much cash does Intel have now? Fourteen billion. So they have just one more shot at this.”

That's bad news for the industry, he

indicated. “Intel has paid for all the innovation in process equipment since the 80s,” Hogan said. “So if Intel stops doing new fabs, where is the innovation going to come from? The Chinese are a generation out. The Koreans are going to get killed with the DRAM thing, so it won't be Samsung. I don't have the answer.”

IoT sucks/IoT will save us

So if memories all move to China and process innovation is too expensive, what path can the U.S. semiconductor industry take? There's lots of hype about the Internet of Things right now, and maybe there's some hope for the industry there. Maybe.

“I think IoT sucks. You have these stupid tiny chips, that cost a buck or so, going into a smart building [and they] can last 30 years.”
-Cliff Hirsch

“No IoT companies have been very successful to date,” said Helen Li, managing partner, Needham & Company. “It's a very fragmented market; there isn't enough volume, but that could change. More applications are coming out of IoT, particularly industrial ones. That's one of the sectors in which people forecast highest growth in next 5 years.”

“I hate IoT,” said Hirsch. “I think IoT sucks. You have these stupid tiny chips, that cost a buck or so, going into a smart building [and they] can last 30 years. One of the things [that drives] the semiconductor industry is turnover. Why do I want to sell a chip that lasts 30 years and costs practically nothing? What I want is to sell a disposable chip that goes in the garbage almost as soon as I sell it. We want to make chips that have value

along with a turnover rate that lets us keep pushing out silicon.”

Hirsch says the answer might be in making devices that aren't generally thought of as traditional semiconductor industry products, like MEMS, microfluidic chips, and novel displays. Hogan is betting on products that move intelligence to the edge, particularly on chips that process both analog and digital signals. What's clear in any case, he said, is that “we are going to have to design-innovate our way out of this, using the processes that we have. It is going to be tough to process-innovate our way out of this.”

Young people wanted

In any discussion about the future, concern about the future workforce typically comes up. The panelists expressed concern about the drop-off in women entering computer science programs, and the challenge to get students interested in STEM in general. The semiconductor industry has an even tougher workforce challenge than the more software-oriented companies, they pointed out. Those companies are struggling to offer jobs that seem as interesting, and to present financial incentives sweet enough to let them compete for talent.

“Maybe the semiconductor industry has to change to be as attractive as the software industry,” Li said. “My son, who is 13, recently had a tour of Google. He was very impressed; he now thinks Google is the best company in the world. Semiconductor companies don't give the same notion.” Said Hogan: “We were never that cool.”



Strategic Ecosystem Partners



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