

CHAMPION OF ENGINEERING

Wenbin Jiang

An Alumnus with a Feel for Photonics



Wenbin Jiang has leveraged his UCSB education to create several successful companies

Wenbin Jiang is a seasoned entrepreneur and inventor and is currently chairman, president, and CEO of **Cytek Biosciences, Inc.**, the most recent of several startup companies he has co-founded since receiving his PhD in electrical and computer engineering from UC Santa Barbara in 1993. His first venture was **E2O Communications**, a company founded in 1998 and acquired by JDS Uniphase in 2004. He has more than one hundred U.S. patents and has authored more than fifty peer-reviewed technical papers. In 2018, he provided funding for a student breakout room in Henley Hall, home to the UCSB Institute for Energy Efficiency, and he became a UCSB Trustee in 2022. We spoke with him in September.

Convergence: *What made you decide to donate generously to the COE?*

Wenbin Jiang: When I was at UCSB, I received so much support, including all my tuition and living expenses. Without that, I wouldn't have been able to finish my studies or have my career. I felt very appreciative. When you have that kind of experience and are able to do something later, it's important to give back to the school so that it can provide a great education to more people. As far as giving to Henley Hall, energy efficiency is always interesting and important from an environmental perspective. Even though it's not directly related to what I'm doing today, it's something I wanted to support. Individual donors are especially important at a public school like UCSB, which has a mission somewhat different from those of private institutions, which often have huge endowments. Giving to UC Santa Barbara, you help not only the school, but society as well.

C: *What continues to stand out for you from your experience at UCSB?*

WJ: The most beneficial thing for me at UCSB was being in [professor of electrical and computer engineering] **John Bowers's** group. When I was selecting a topic to pursue for my PhD, John pretty much laid out a big box within the photonics and III-V semiconductor space and then gave me full freedom to decide what to do within it. Once I identified my subject, John provided all the help and support I needed to help me earn my PhD and enable me to pursue my career. High-speed lasers were big at that time, and I wrote my dissertation on high-speed (femtosecond) vertical-cavity lasers.

C: *What changes have you seen since you were here?*

WJ: One of the main changes I see is that the campus is a lot more crowded, with people and with new buildings, which indicates how much the school has grown and how much success the college has had in attracting students, faculty, research programs, and funding to build and expand.

C: *How did your education at UCSB prepare you for life as an entrepreneur, and were there other formative experiences that led you in an entrepreneurial direction?*

WJ: Independent study and research, the kind you do while working toward a PhD, are both great for developing ideas and concepts. Also, when I was in the program, John [Bowers] had a course called Engineering and Entrepreneurship [now taught in the Technology Management Department]. I didn't actually register for the class; I just went and listened to the many successful entrepreneurs he invited to speak. That gave me my first understanding of what you need to be an entrepreneur, and I found it to be really helpful.

One of my first jobs, at Motorola, also helped. The VP of research, who led our group, was an entrepreneur himself who had come out of Bell Labs and succeeded in his first company before joining Motorola. I gained a lot of understanding and background there. I don't think I was a born entrepreneur. Together, my education at UCSB and my time at Motorola, which was a very innovative company that encouraged us to file for patents, kind of created a path for me.

C: *Was there a moment when you realized that you would become an entrepreneur?*

WJ: For me it was a slow migration. My intention out of school was to go into the academic space and eventually become a professor. But as I spent time at Motorola, I gradually drifted away from that, and toward the end of my five years there, we partnered closely with a startup company that did a lot of work for the project I was on. That gave some of us the idea that it was something we could try as well.

C: *What would you tell an entrepreneurially minded student are the keys to a successful startup?*

WJ: First, you have to have a great idea, probably a technology. Then, you have to think about whether that technology can become a marketable product. Will people buy it? You always need to think about the market and why customers ought to buy what you make. If there is a market, the question is, how big is it? And also, will you be able to generate enough profit to reinvest in your business and grow it? You will have to continue to innovate with new features

that will motivate your customers to come back. It's like Apple with the iPhone; they continuously innovate so that there is always something new that brings customers back again and again.

Also, when you run a business, you need to think about how your investors may exit, because they are most likely not going to stay invested in a business forever. Selling the company is one way; going public is another. Being successful in a business means having a successful exit for your investors, too.

C: *All of your companies have involved photonics, but the newest one is your first in the biotechnology space. Can you talk about that?*

WJ: I started Cytek Biosciences with one of my undergraduate classmates in 2014, again leveraging photonics technology, but with the goal of moving flow cytometry into the 21st century. The new technology involves quite a lot of work of several UCSB Nobel Prize winners. We adopted the solid-state semiconductor laser, which grew out of **Herbert Kroemer's** Nobel Prize-winning work on heterojunctions. We called on **Shuji Nakamura's** work with nitrides, which enabled the blue and violet lasers used in the new technology. And the reagents our instrument supports include UCSB patented polymer dyes. It's exciting to see so many UCSB technologies being incorporated in our tool, which was launched in 2017 and is now in almost every premier life-sciences research lab in the U.S.

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C: *What is one critical bit of advice you would offer entrepreneurially minded students, and what's your advice for dealing with the inevitable adversity that comes with the territory?*

WJ: First, it's important to have partners. You may think one way, and your partner may think another way. That's good. That's how you cover your weaknesses. You can't be perfect, and everyone makes mistakes, but having a partner means that there is always someone over there watching you, so you make fewer mistakes.

For the second part, every business has ups and downs. That's OK. If you have a vision and a commitment and you really believe in your technology, just keep pushing, and eventually you will succeed. Just like with this company, Cytek. We started to talk to investors long before we started

the company. The first six to twelve months, not much happened. People thought the technology was interesting but were not willing to invest. But if you keep going, eventually you'll find the person who says, "Wow, that's great technology. I've been looking for something like that for a long time, and I'd like to support it." Just don't give up.

C: *Which of your one hundred-plus patents gives you the greatest satisfaction?*

WJ: The most impactful technology I started is the one I did not patent [laughs]. When I first started E2O Communications, we focused on developing photonics technologies to drive next-gen interconnections. IBM was the leader, and the technology at that time was based on CD lasers and silicon photodetectors, which became stretched when Ethernet and fiber-channel standards reach Gigabit speed. So, we started to switch to VCSELs and developed a gallium arsenide photodetector on a semi-insulating substrate.

We didn't think it was worthwhile to patent a photodiode technology. When you develop an optical transmission module, you have a transmission laser on one side, a detector on the other side, and the architecture around the module. We thought, *this was just a detector*, so we patented everything else but missed the detector. Because of the way the detector was designed, however, it not only supported our initial goal of one gigabyte ethernet

and fiber channel, but also eventually was able to support twenty-five gigabytes based on exactly the same design concept. Today, because we didn't patent it, and probably avoided lots of litigation, hundreds of millions of these detectors are deployed globally. They're in almost every data center, research lab, and building. It's the most successful product I've developed. I'm proud of it, but it's not patented.

C: *Why did you decide to accept the offer to become a trustee, and how has the experience been so far?*

WJ: I was invited to join the board of trustees by Chancellor Yang in 2022. I feel really honored to be able to contribute to the growth of UCSB through this board. As a new member, I am still learning and will get up to speed soon.