

# Cultivating Entrepreneurship

## The Caltech Office of Technology Transfer and Corporate Partnerships

Four years ago, Professor Morteza Gharib became Caltech's Vice Provost for Research. One of the offices under his leadership is the Office of Technology Transfer and Corporate Partnerships (OTTCP). His extensive contributions to a wide array of engineering and research topics, ranging from fluid mechanics to bioinspired medical devices, as well as his recognized success as an entrepreneur, make him very well suited to lead this office.

Professor Gharib has been working closely with Frederic (Fred) Farina, the Chief Innovation and Corporate Partnerships Officer, to strengthen OTTCP and cultivate a culture of entrepreneurship at Caltech. In light of the fact that 50 percent of all inventions from the Caltech campus come from the Engineering and Applied Science Division and how often faculty comment on how Caltech is the best place to protect their inventions and technology, *ENGenious* sat down with Gharib and Farina to learn more about their efforts and successes.

### **ENGenious:** What's distinctive about technology transfer at Caltech?

**Gharib:** Over the past 20 years, Larry Gilbert, Rich Wolf, and now Fred Farina have established a culture at Caltech where faculty know that their ideas and inventions have value; furthermore, they let the faculty judge that value. One of the main reasons I decided to become vice provost was to help further develop this culture of entrepreneurship. Over the past four years, Fred and I have worked on many projects, such as bringing more

entrepreneurship to education and combining Corporate Relations with the Office of Technology Transfer, which reflects how much industry now values intellectual property.

**Farina:** Larry Gilbert's great vision established the office with principles that still make it what it is. The first and most important is that we had to be completely oriented to serving the faculty and establishing trust with them. Faculty have to see us as an ally, as opposed to a bureaucratic office that stands in the way of what they are trying to accomplish. So we try our best to be a bureaucracy-free zone and help them to overcome the obstacles they encounter on the path to commercializing their ideas. Because of that, we get a lot of disclosures from the faculty. Once they disclose their ideas, we can start working on patenting and commercializing them. We really involve the faculty in deciding whether or not to file. It's important to think about what kind of product the idea could turn into and where it's going to fit in the market, but at the end of the day the faculty member's passion for the idea and drive to commercialize it are going to be the most important fac-

tors in the decision to file for patent protection.

### **ENGenious:** What was your path to technology transfer?

**Farina:** I got a master's in electrical engineering in '92 at Caltech and then right away got a job at JPL working on GPS technology. Although I enjoyed my job, I quickly realized that research, in the long run, was not what I wanted to focus on. At the same time I was very interested in the process of innovation, the creative process of inventing, and the tools available to inventors to protect their ideas and bring them to market. So I got a job in a law firm doing patent prosecution, which involves drafting patent applications, submitting them to the U.S. Patent Office, and advocating the patentability of the inventions, the ultimate goal being the grant of a patent. But soon I found out that once the patents are filed, it's somebody else that takes on what I think is the more interesting part: commercialization. I was seriously looking at law school when an alumna friend of mine told me about a job opening at Caltech in technology transfer. I had an interview with Larry Gilbert and Rich Wolf, who explained what tech transfer was, and I immediately knew it was what I was looking for. It turned out that they had previously offered the job to a guy who first accepted but then turned it down. His name was Fred, he had a master's in electrical engineering from Caltech, and he worked at JPL. So when I showed up at the interview, I was Fred with a mas-



Frederic Farina and Morteza Gharib

ter's in electrical engineering from Caltech and with JPL experience—I fit right in!

### **ENGenious:** How has the office changed over the past four years?

**Gharib:** One key change has been the physical environment: OTTCP moved to a new space that's designed to be a point of gathering where students, faculty, and postdocs are encouraged to show up and exchange ideas. Therefore, we are spending more time with those interested in starting companies, discussing the pros and cons of having a business. One can teach certain tools useful to entrepreneurs, but in the end entrepreneurship has to be cultivated in the same way as creativity.

**Farina:** Having an environment that is open, dynamic, and looks in sync with its time is part of creating the buzz about tech transfer and entrepreneurship. In the eyes of the campus community, the location raises the importance of what we do. Also, we negotiate deals that have potentially really high value, and when you negotiate at that level with companies, you have a lot more credibility if you have a space that shows some level of success as opposed to the typical old academic space.

**Gharib:** Another key change is that we have streamlined many of the regulations. I'm hoping, before I step down as vice provost, to have all the pieces in place. We need to really make sure the faculty feel that they have an environment where they can be creative without worrying about all the nitty-gritty. For instance, in the past, if faculty had a one-percent stock in a company, that company could not send them any funds to do research. So, imagine that a faculty member starts a small company, she doesn't have that much cash, and she needs to utilize a unique and very expensive piece of equipment. The same equipment is sitting in her lab or somewhere on the Caltech campus, but the company cannot send her money to do research using that equipment because the policy does not allow it. I am happy to say that, working with the Caltech Office of the General Counsel, we have come up with a new rule that makes it okay for a Caltech-grown company to sponsor research at Caltech, even in the faculty member's own lab. To ensure that any possible conflicts of interest that might arise from a situation where a faculty member has a sponsored research project for her own company carried out in her Caltech lab, we have implemented Research Management Plans, which

address numerous potential conflict issues. The Office of Research Compliance provides assistance to faculty members who need to develop a Research Management Plan. For example, if you're an interested faculty member, we sit down with you and make sure that students and postdocs who are in your group know that you have an interest in the company sponsoring the research and that the student or postdoc understands exactly what they're working on and your expectations for their work. This is an example of how we monitor the situation, such that nobody is taken advantage of. We endeavor to make sure that appropriate credit is given for innovation; we try to support people who want to be in the company; we discuss with faculty, staff, and students whether or not they can be involved; and, if they can, we give guidance as to how. If conflicts are identified, we manage, mitigate, or eliminate them, because we want to ensure transparency, integrity, and fairness in this process while supporting faculty entrepreneurship and the company by allowing both to benefit from all the talent and equipment available at Caltech. In the end, society benefits because incredible ideas become commercial realities, and Caltech benefits, too—financially, from licensing royalties and equity interests, and from a personnel perspective, by giving faculty, staff, and students unique entrepreneurial opportunities.

**Farina:** In addition to streamlining regulations and offices to assist the faculty, we are also trying to create a one-stop shop for corporations. There's been a movement toward that in academia, and Caltech is one of the first to really take a step actively in that direction. Thus, if the company needs intellectual property licensing, they can come to OTTCP. Also, if they need to start collaboration with a faculty member and they wish to write a contract, they can

come to OTTCP. In the past, Caltech had an Office of Technology Transfer that just focused on the intellectual property, an Office of Corporate Relations in Development mainly focused on gifts, an Office of Sponsored Research that negotiated the corporate contracts, and the Office of the General Counsel, which got involved with legal issues. Thus, from the point of view of the corporation, the process got complicated really quickly. Now, the idea is to simplify everything on the Caltech side by having one office where there's one person that deals with the corporation and takes care of all of their needs, coordinating with other Caltech departments when necessary.

**ENGenious: Is this also one of the reasons the offices of Technology Transfer and Corporate Relations merged?**

**Farina:** Yes. The other reason is that, in the past, the companies gave a fair amount of gifts to universities, but that's been in decline for many years. Now companies tend to sponsor research projects and want to see a return on their investment in the form of intellectual property or people to hire. Since Caltech doesn't have a lot of students, they don't get a big bang for their buck when they come here to recruit. So, with the new office, we focus on showing them that they can get a lot out of sponsoring research and, of course, welcome gifts as well.

**ENGenious: How are you cultivating entrepreneurship in the next generation at Caltech?**

**Gharib:** The challenge is to establish a curriculum that helps us to actually educate the next generation of what I call chief technology/chief executive officers (CTO/CEOs). These individuals need to speak the languages of both business and technology. Then, once the company is in safe water, a

seasoned CEO comes in and expands the company. In my experience, most companies fail because the postdocs or students that went to the company didn't have the right business tools. They don't want to start the company and then go learn management, but maybe they could take a one-year course at Caltech to prepare them to speak both languages. We're in a good position to have a great program that can educate the next generation to face the real challenges in starting a technology-based company. I want them to grasp the idea that entrepreneurship is not just about business. It's a way of thinking and a way to manage your life. We want our graduates to take risks and be bold. They shouldn't be just homework solvers but problem solvers! This way they can be better students and better citizens.

**Farina:** Last academic year, we started a 10-week lecture series on entrepreneurship. Working with Professor Gharib and the Engineering and Applied Science Division, we developed a course for undergraduate and graduate students taught in part by Rob Chess, who's a Caltech trustee and alum, an entrepreneur, and a professor at Stanford's Graduate School of Business. Chuck Holloway, also a professor at Stanford's business school, and Ed Zschau, who established the entrepreneurship program at Princeton, co-taught the course. We had 62 students apply for the course, which for Caltech is a big number! In 1995, when the tech transfer office was started, it focused on the faculty and intellectual property; the students were not as much of a focus. The idea now is to also give the students a state of mind that's entrepreneurial, wherever they want to take it. We're not trying to divert them from science and engineering careers, but there's a growing number of students who want to go into business careers, so we are trying

to provide them with all the background they need to compete in that world. When students leave Caltech, we want to make sure they feel that Caltech helped them and provided them with the tools they need to succeed. This is particularly important because students who go into business careers such as entrepreneurship are the most likely to become significant supporters of the Institute.

**ENGenious: What do alumni and friends of Caltech need to know about OTTCP?**

**Farina:** They need to know that the office exists, and that it has become a really significant part of what Caltech is about and also what Caltech wants to do. I think it's very reassuring to alumni to see that we're connecting to the real world more through this activity. Also, we are in the process of putting in place a mentorship program for researchers and students, and we will reach out to alumni who understand how to start companies and have certain industry experiences. We need to continue to make sure Caltech plays a critical role, not just in pushing the boundaries of science and engineering, but also, connecting with society by commercializing the fruits of its research. We have to show the usefulness of the work we do. One way that we do that is by bringing new technologies, products, services, therapies, etc., to the public to increase quality of life. Alumni can and should be a big part of that!

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The renovations of the Guggenheim Building and the Earle M. Jorgensen Laboratory as well as the design and construction of the Walter and Leonore Annenberg Center for Information Science and Technology have received many awards and honors over the past seven years. The renovations of the historic Guggenheim Building, which was one of the seven original buildings established in the 1920s by the Guggenheim Foundation, has received 10 honors, including three from the American Institute of Architects. The Jorgensen Laboratory has received five honors, with the latest being a Sustainable Innovation Award from the U.S. Green Building Council. The newly built Annenberg Center has also received five honors, including being named the 2011 Project of the Year by the U.S. Green Building Council's Los Angeles Chapter. To learn more and view the list of awards, visit [eas.caltech.edu/about](http://eas.caltech.edu/about).