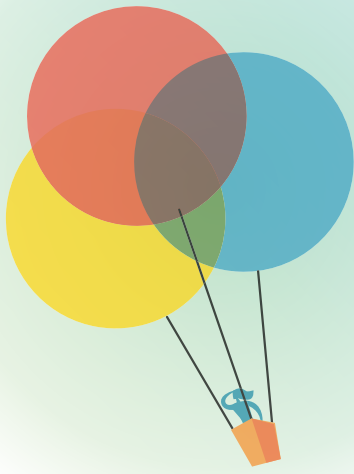


# New HIT Fund Takes Flight





## The High Impact Technology (HIT) Fund aims to accelerate the delivery of Stanford-based innovations to the world.

Hundreds of new inventions are disclosed to the Stanford University [Office of Technology Licensing](#) (OTL) each year to initiate the process of protecting and commercializing the new technologies. Only a fraction of those discoveries make it across the innovation “valley of death” to the market where they can benefit the public. A new initiative of OTL, which is part of the [Office of the Vice Provost and Dean of Research](#) (VPDoR), hopes to bridge the gap between the academic lab and a commercial partner, which might be a multinational corporation or a startup created by Stanford researchers.

The [High Impact Technology \(HIT\) Fund](#), which launched as a pilot last year, provides milestone-based funding, mentoring, and campus and industry connections to Stanford researchers whose ideas have commercial appeal. The fund is part of Stanford’s [vision to accelerate the delivery of solutions](#) for society’s greatest challenges.

“We realized there are a lot of new invention disclosures that aren’t quite ready for prime time,” said [Karin Immergluck](#), Associate Vice Provost for OTL. “We needed to invest resources in helping our inventors mature their ideas more fully in order to make them attractive for investors and industry partners.”

OTL is uniquely positioned to deliver maximum benefit through the HIT Fund: inventions made with university resources are disclosed to OTL so team members have a birds-eye view of the most innovative work on campus; OTL staff have deep connections to industry because they regularly license Stanford technologies to commercial entities; and, unlike other accelerator-type programs on campus that work within specific schools or technology sectors, OTL engages across the university, meaning it can provide funding in any area.

“We can fill in the white space—the unmet need in areas that don’t yet have access to translational or proof-of-concept funding,” Immergluck said.

In 2022, OTL set aside \$17 million in licensing income to launch HIT, hiring Director [Nitin Parekh](#) and Program Manager [Laura Clark Murray](#) to bring the initiative to life.

Parekh started out by identifying what Stanford researchers needed in their quest to commercialize their technologies. Last spring, he went on a listening tour, meeting with professors who had successfully licensed their inventions in the past, young researchers who were interested in starting companies, and OTL staff who were in regular communication with industry representatives.

*“What was also clear through the entire HIT Fund experience is how much effort goes into finding the best application to bring to market. The team really forced us to shift and push our thinking and even our research efforts.”*

—Jonathan Fan,  
Associate Professor of Electrical Engineering

“As I talked to various people, I realized it wasn’t all about the money,” Parekh said. “Equally important was this idea of building a customized team, offering patent strategy and business guidance, and providing industry connections. We’re trying to give them the tools and skill sets so they can be successful on their journey of commercialization or entrepreneurship.”

The results have been promising. Parekh selected [13 technologies](#) for the pilot, including several focused on sustainability. Some of the researchers did not require funding; others received amounts of up to \$200,000. All teams had access to domain experts and industry executives, Stanford Graduate School of Business MBA student interns, and regular contact with Parekh and Murray, who provided mentorship and general support.

Of those 13 project teams, three have already created companies and are engaged in licensing negotiations. Collectively, the HIT Fund has facilitated discussions for project leaders with more than 150 industry experts and stakeholders, including potential partners, possible customers, and venture capital investors.

*“That’s the big thing I took from the HIT Fund experience: Learning to think like an entrepreneur.”*

—John Feist, PhD,  
Stanford School of Chemistry, 2023

### SAFER, LONGER-LASTING BATTERIES

By the time Zhiao Yu ’22 PhD connected with the HIT Fund team, he was already exploring commercialization of the use of [a breakthrough electrolyte to make lithium-metal batteries](#) a practical reality. Lithium-metal batteries have higher energy density than lithium-ion batteries but their instability makes them susceptible to short-circuiting and fires. Yu’s electrolyte eliminates the stability problem, and batteries produced with his technology have energy density as high or higher than existing options, a greater cycle life (the number of times a battery can be charged and discharged over time), and can be manufactured using the same processes as lithium-ion batteries.

Yu said the HIT Fund’s support—including introductions to industry contacts with whom he continues to collaborate—was invaluable in the creation of his company, Feon Energy.

The HIT funding also allowed Yu to see if his technology could be scaled to a level commensurate with commercial manufacturing requirements—a “go- or no-go decision.” And it could.

“In our first batch, we went from tens of grams to five kilograms,” he recalled. “That’s a huge jump in process engineering and optimization.”

### BUILDING BETTER COMPOSITES

When Stanford post-doctoral researcher Dan C. Lee and John Feist ’23 PhD were first selected for the HIT Fund last year, they knew they had an important technology—[a fast-curing resin](#) produced from a byproduct of the oil industry—that could change the world of composites. They just weren’t quite sure what kind of change would be most amenable to the market.

Composites, including some types of plastic, are made from a combination of materials that are stronger than the sum of their parts. The resin created by Lee and Feist can help synthesize composites with higher performance, more efficient manufacturing, and end-of-life recycling. With introductions initiated by HIT, the pair met and discussed their technology with representatives from the National Renewable Energy Laboratory, the textile industry, and 3D printing, battery packaging, and even sporting-goods manufacturers. Ultimately, they decided to focus on how their technology can simplify the production of wind turbines.

The HIT Fund team’s mentorship was crucial, the pair said.

“When we were struggling with making a decision, they never told us how to think or what to do, but they held us to a standard of making sure that what we were doing made sense,” Lee explained.

Feist added that the fund’s guidance through the entrepreneurial process was also invaluable. “That’s the big thing we took from the HIT Fund experience: learning to think like an entrepreneur,” Feist said and Lee agreed.

“Thanks to them, we’re months ahead of where we thought we would be,” Lee said.

## ELECTRIFYING THE CHEMICAL INDUSTRY

Stanford Professor Jonathan Fan is also determined to change the way an entire industrial process works. His focus is the chemical manufacturing industry, which typically burns fossil fuels to reach the high-grade temperatures necessary to process chemicals. Prof. Fan's technology electrifies the heating process, relying on [an inductive heating platform that uses a metamaterial plate within a reactor](#) to produce a customized volumetric heating profile. Assuming the electricity is produced with renewable energy, his process would make the industry significantly more sustainable.

For Prof. Fan, the HIT Fund organized and participated in discussions with senior strategic executives at leading companies, brought on an MBA student as an intern, and hired an industry expert who helped with customer discovery and completed a techno-economic and competitive analysis.

"We know that the decarbonization of high-grade heat is a huge opportunity, but what was also clear through the entire HIT Fund experience, is how much effort goes into finding the best application to bring to market," Prof. Fan said. "The team really forced us to shift and push our thinking and even our research efforts. At the end of the day, this technology only matters if it translates into real-world solutions."

*"The HIT Fund works with innovators to identify the best way forward, supporting them at a pivotal stage to help make their research a reality."*

**—Arun Majumdar,  
Dean of Doerr School of Sustainability**

## LOOKING AHEAD

The HIT Fund will formally launch this summer with an annual competitive solicitation. Applications will be reviewed by an advisory board composed of industry executives, venture capitalists, and Stanford faculty. Milestone-based awards will be up to \$250,000.

In its first year, the HIT Fund addressed specific concerns that faculty shared about the gap between the discovery of a new technology and the delivery of a product or service.

"The researchers we work with have discovered innovative technologies that have demonstrated a high potential for impact," Parekh said. "We help them identify obstacles to entry in the market and find viable pathways to commercialization by connecting them with key partners and advisers — for today and for their future."

Doerr School of Sustainability Dean [Arun Majumdar](#) said the HIT Fund is an important partner in accelerating the delivery of technical solutions to the world's most pressing problems.

"To have impact, great ideas need to leave the lab and enter the world," Majumdar said. "The HIT Fund works with innovators to identify the best way forward, supporting them at a pivotal stage to help make their research a reality."

Randy Harward, a former Senior Vice President of Material and Manufacturing Innovation for Under Armour who advised one of the project teams, said the HIT Fund is a model for encouraging innovation and ensuring impact.

"Serving in this capacity has been an incredibly rewarding experience, allowing me to share my years of expertise in material development and R&D with sharp entrepreneurial students and academics within a dynamic community," said Harward. "Our collaboration to shape the direction of innovative ideas ensures they align with current market and societal needs."