2018 Impact Report

cyclotronroad

Activating Tomorrow's Technology Leaders

How Cyclotron Road's Entrepreneurial Fellowships Are Bridging the Science-to-Product Gap

The Problem

Entrepreneurial scientists are uniquely capable of creating transformative products that can benefit society, but today's research ecosystem does not support the path from science to product. That means our smartest, best trained people aren't able to develop solutions to pressing problems in energy, manufacturing, defense, food, and health.

What We Do

Cyclotron Road activates tomorrow's technology leaders by supporting world-leading scientists as they move a transformative technology concept toward a first product.

Our entrepreneurial fellowships empower these innovators with funding, access to world-class research facilities, and intensive business mentorship.

Since 2015, we've supported 41 fellows focused on advanced energy, materials, and manufacturing technologies.

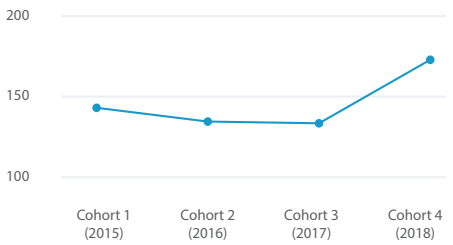
AS A FELLOWSHIP, OUR SUPPORT ENABLES A NEW PATH FOR THE DEVELOPMENT OF AN INNOVATOR AND THEIR IDEA THAT OTHERWISE WOULD NOT EXIST.

Our Reach

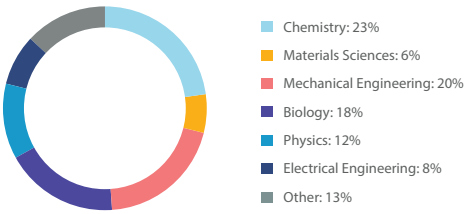
More than 650 entrepreneurial scientists and engineers from around the world have applied for Cyclotron Road since 2015. Last year, we had 177 applicants for Cohort Four, the most in our history.

This response validates the immense pool of scientific talent that could be harnessed to convert scientific discoveries into new technologies.

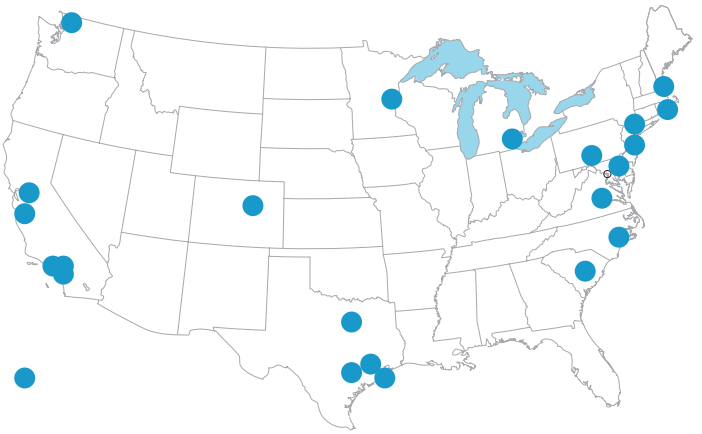
FELLOWSHIP APPICANTS BY YEAR



FINALIST FIELDS OF EXPERTISE



FINALIST GRADUATE UNIVERSITIES



Boston University
California Institute of Technology
Columbia University
Duke University
Johns Hopkins University
Massachusetts Institute of Technology
Penn State University
Princeton University
Stanford University
Texas A&M University
University of British Columbia
University of California, Berkeley
University of California, Irvine
University of California, Los Angeles
University of Colorado
University of Houston
University of Hawaii
University of Michigan
University of Minnesota
University of South Carolina
University of Texas, Austin
University of Texas, Arlington
University of Virginia

Meet Cohort Four

Our most recent cohort joined Cyclotron Road in May, 2018. Across their projects they are advancing new technology concepts for long-duration energy storage, clean power generation, sustainable chemicals, quantum computing, and beyond.

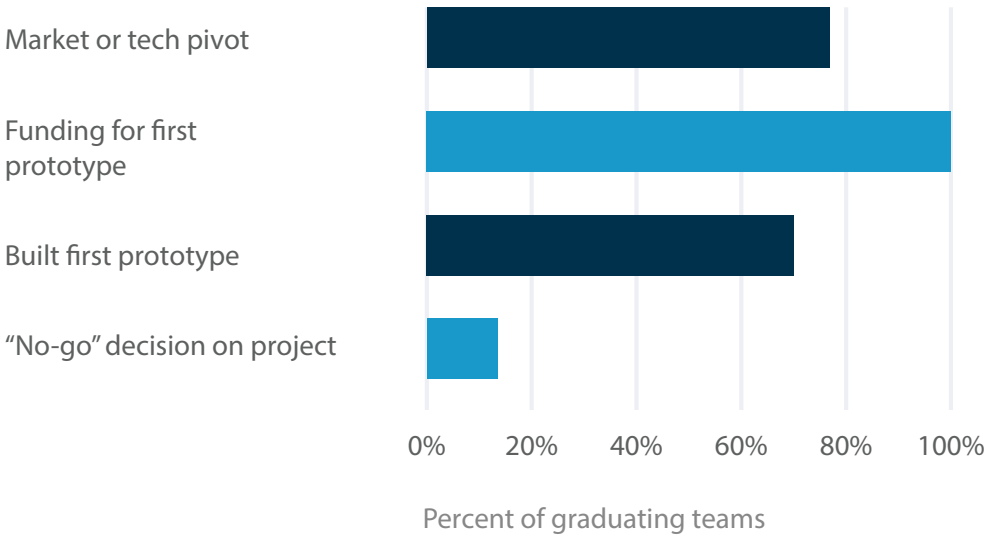
http://www.cyclotronroad.org/fellows#cohort4

1. Erkan Aktakka, ActiveMEMS; 2. Miguel Sierra Aznar, Noble Thermodynamic Systems; 3. Justin Briggs, Antora Energy; 4. Nishita Deka, Sonera Magnetics; 5. Jill Fuss, CinderBio; 6. Christopher Graves, Noon Energy; 7. Kevin Kung, Takachar; 8. Dominic Labanowski (not pictured), Sonera Magnetics; 9. Tim Latimer, Fervo Energy; 10. Alexei Marchenkov, Bleximo; 11. Jack Norbeck, Fervo Energy; 12. Andrew Ponec, Antora Energy; 13. Steve Yannone, CinderBio

Our Support

Over the last four years, Cyclotron Road fellows have demonstrated that our support can enable key learning cycles, pivots, and de-risking milestones. Our support builds a bridge to partnerships and financing opportunities that are aligned with an appropriate path to market. This is especially important for industries like energy, manufacturing, and electronics, where barriers to entry are massive and competition is fierce.

KEY MILESTONES ACHIEVED AT CYCLOTRON ROAD



Opus 12

"Cyclotron Road allowed us to build the prototype that we needed to get private funding."

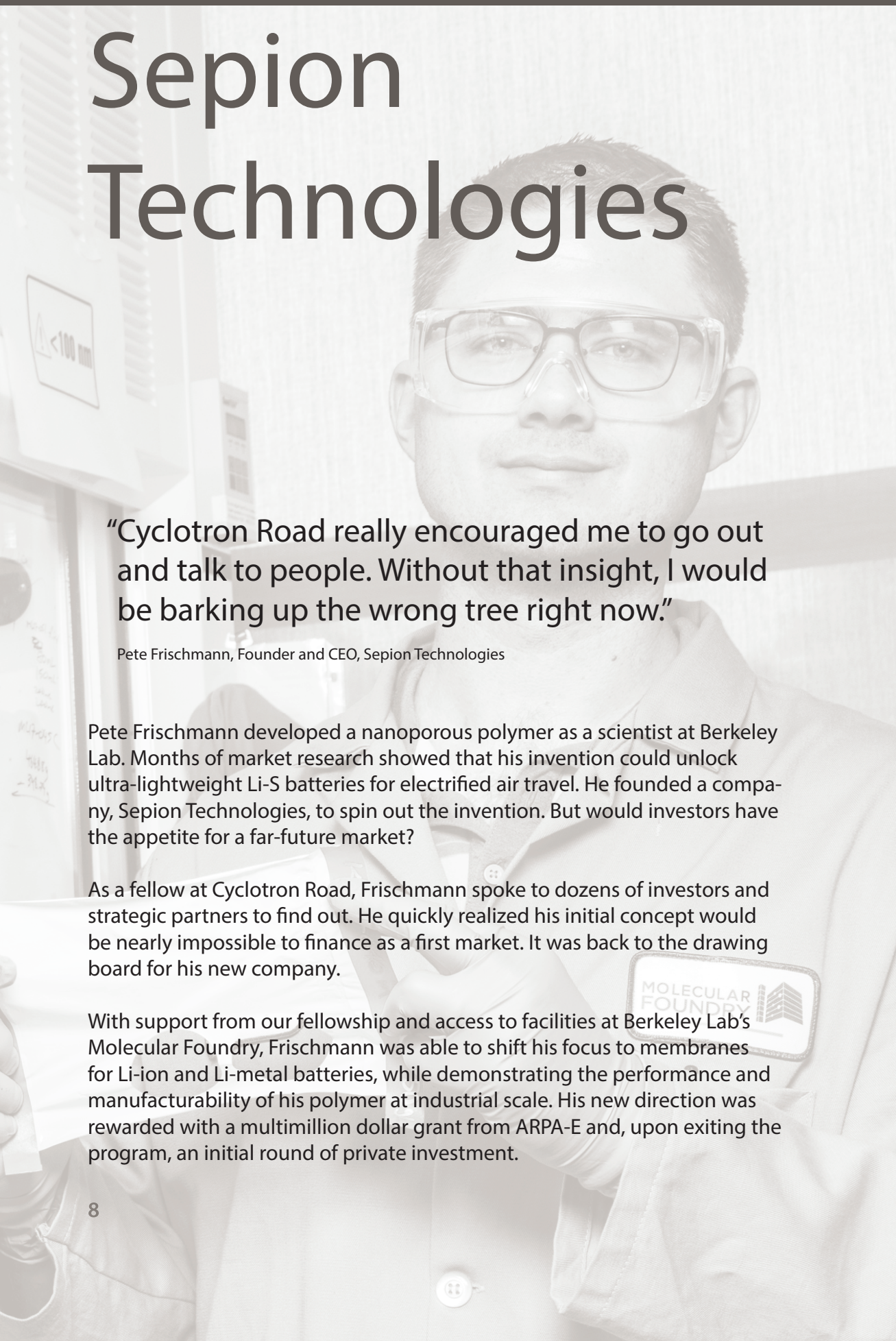
Etosha Cave, Cofounder and CSO, Opus 12

Etosha Cave spent her PhD at Stanford working to convert CO_2 pollution into valuable commodity chemicals. After years of research, she and her colleagues were convinced they could build something transformative: a reactor that would produce the world's first economical carbon neutral fuels. They founded a startup, Opus 12, to bring this vision to market.

But, after a few conversations with potential partners and investors, they were stuck. The problem wasn't the technology's transformative potential. People understood that. But without a working prototype that could take several years and millions of dollars to assemble, investors and customers were too skeptical to buy in.

Over two years supported by Cyclotron Road, Cave and her co-founders were able to validate a first market, build a prototype reactor, form a key commercial partnership, and, ultimately, raise funding they needed to build a team and scale their company.

Sepion Technologies



> "Cyclotron Road really encouraged me to go out and talk to people. Without that insight, I would be barking up the wrong tree right now."
>
> Pete Frischmann, Founder and CEO, Sepion Technologies

Pete Frischmann developed a nanoporous polymer as a scientist at Berkeley Lab. Months of market research showed that his invention could unlock ultra-lightweight Li-S batteries for electrified air travel. He founded a company, Sepion Technologies, to spin out the invention. But would investors have the appetite for a far-future market?

As a fellow at Cyclotron Road, Frischmann spoke to dozens of investors and strategic partners to find out. He quickly realized his initial concept would be nearly impossible to finance as a first market. It was back to the drawing board for his new company.

With support from our fellowship and access to facilities at Berkeley Lab's Molecular Foundry, Frischmann was able to shift his focus to membranes for Li-ion and Li-metal batteries, while demonstrating the performance and manufacturability of his polymer at industrial scale. His new direction was rewarded with a multimillion dollar grant from ARPA-E and, upon exiting the program, an initial round of private investment.

Mosaic Materials

> "If we can make this work, it has a lot of promise to act as a bridge to a lower-carbon future."
>
> Tom McDonald, Founder and CEO, Mosaic Materials

As a PhD student at UC Berkeley, Tom McDonald studied metal-organic-frameworks—new materials with an unrivaled ability to absorb gases, such as CO_2. McDonald saw a huge potential impact in this field: MOFs were one of the most promising ways to achieve carbon capture and use it to mitigate climate change.

But, while thousands of MOF materials with commercially relevant properties had been discovered in academic labs, few, if any, had entered commercial use. Capturing this opportunity would require scaling MOF synthesis from grams to kilograms and finding a high-value first market.

With Cyclotron Road support, McDonald and two cofounders started Mosaic Materials to do just that. Working at Berkeley Lab, Mosaic scaled up their synthesis within a few months. They also spoke to dozens of customers to identify high-value applications for CO_2 removal in submarines, natural gas purification, and biogas upgrading. This unlocked funding from the California Energy Commission for a pilot demonstration and their first private investment, both key stepping stones to a first commercial product.

Our Impact

We've now supported 41 fellows across 30 transformative technology projects. They have collectively attracted more than $80 million in early-stage funding beyond our fellowship support.

These results have created a center of mass for the innovation community, attracting executives and influencers from the world's largest corporations and philanthropies to get involved.

OUR NETWORK: BY THE NUMBERS

41
Cyclotron Road fellows supported since 2015

120+
Employees across their companies

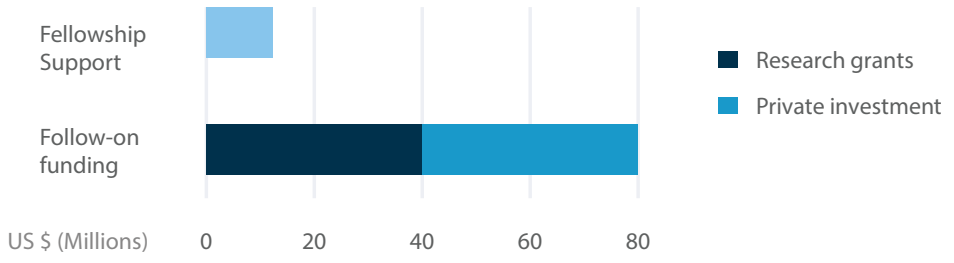
100+
industry veterans engaged as advisors to their projects

800+
VIP visitors to Cyclotron Road since 2015

FUNDERS OF CYCLOTRON ROAD TEAMS INCLUDE:

ARPA-E
Baruch Future Ventures
Boeing Horizon-X
Breakout Labs
Congruent Ventures
DARPA
Data Collective
Evok Innovations
First Round Capital
Incite
In-Q-Tel
Prelude Ventures
Shell Technology Ventures
and more...

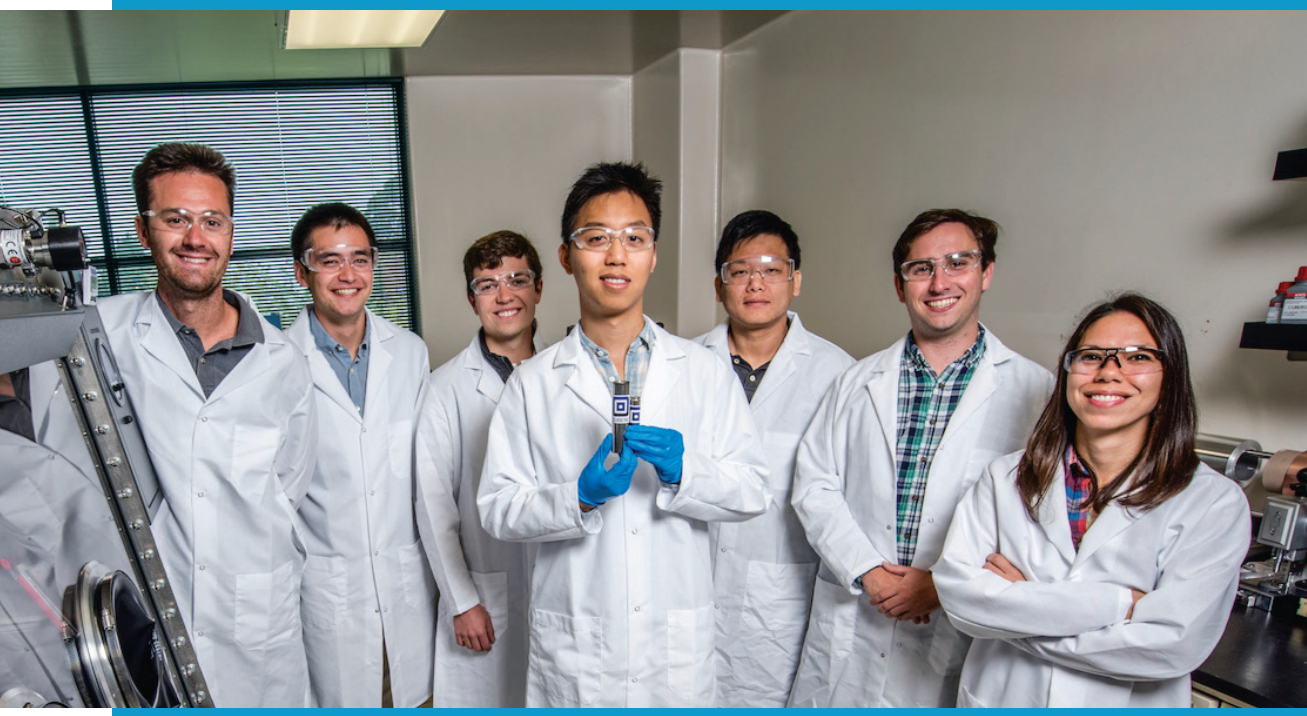
A CATALYST FOR PUBLIC AND PRIVATE FUNDING



Why It Matters

Science entrepreneurs struggle to find their footing in today's innovation system, even though their innovations could address society's most pressing needs. Our goal is to keep them in the game, focused on maturing their ideas into transformative products and businesses.

Ultimately, our success will be driven by the positive impact created by our fellows and alumni over the course of their careers, measured on the scale of gigawatts, tons of CO_2, billions of dollars, and millions of lives.



Want to learn more about Cyclotron Road?

Visit our website

cyclotronroad.org

Acknowledgement

The continued progress of Cyclotron Road would not be possible without foundational support from the DOE Advanced Manufacturing Office and the California Energy Commission, as well as the guidance and support of the Leadership Team of Lawrence Berkeley National Laboratory and the Activation Energy Leadership Council.

Supporters and Partners

We are assembling a community of committed public and private partners to support Cyclotron Road. Through donations of time, money, equipment, or services, our partners allow us to advance our mission while supporting their aligned strategic priorities.

Interested in partnering with us? Visit our website to learn more and start the conversation.

Thank you to our supporting partners:

Cyclotron Road is a partnership between Lawrence Berkeley National Laboratory and Activation Energy


energy since high school
2009
2011