



**STARTUP AND VENTURE
CAPITAL TRENDS
AT THE
UNIVERSITY OF
CALIFORNIA,
BERKELEY**

**THE INAUGURAL REPORT
ON UC BERKELEY'S
STARTUP ECOSYSTEM**

PREPARED BY:
**startup@
BerkeleyLaw**
UNIVERSITY OF CALIFORNIA

PUBLISHED AUGUST 2018

TABLE OF CONTENTS

PART ONE INTRODUCTION

- 3 About The Report
- 4 Data, Methodology and Key Definitions
- 5 Ecosystem Overview

PART TWO ECOSYSTEM TRENDS

- 8 Key Sector Trends
- 10 Venture Capital
- 11 Small Business Innovation Research (SBIR) Grants
- 13 Demographic Trends

PART THREE CONCLUSION

- 15 Closing Remarks
- 16 Contributors



ABOUT STARTUP@BERKELEYLAW

Startup@BerkeleyLaw is an initiative of the Berkeley Center for Law and Business (BCLB) in collaboration with the Berkeley Center for Law and Technology. BCLB is Berkeley Law's hub for rigorous, relevant, and empirically-based research, education, and programming on the interrelationships of the law and business. Areas of focus include venture capital and entrepreneurship, corporate social responsibility, capital markets, and mergers and acquisitions.

Startup@BerkeleyLaw serves as UC Berkeley's primary platform for training entrepreneurs, investors, and students on the legal, financial, and operational issues confronting early stage companies. Current undergraduate and graduate students, post docs, staff, faculty, and alumni from across UC Berkeley attend training workshops and lectures aimed to enable them to be successful entrepreneurs from the very start of their endeavors.



ABOUT THE AUTHOR

Ruochen Huang is a Research Fellow at Startup@BerkeleyLaw. Ruochen is the creator of BerkeleyBase, the definitive database of local UC Berkeley startups. Ruochen was first exposed to startups at CrunchBase, where he helped create the TechCrunch Unicorn Leaderboard, and published deep dive analyses on the wearables industry.

ABOUT THE REPORT

The Startup and Venture Capital Trends Report provides a comprehensive quantitative analysis of the startup ecosystem at the University of California, Berkeley (UC Berkeley). In particular, our focus is on those companies that have been supported by at least one of the seven campus incubator or accelerator programs described within this report.

- How is the ecosystem thriving, or not thriving, and what are some unique characteristics among the startups that it has produced?
- In which industries and verticals are these startups tackling challenges?
- Who are the most active investors in the ecosystem?
- What are the demographics of the ecosystem? (Given available data, we focus in this report on gender diversity).

DATA, METHODOLOGY AND KEY DEFINITIONS

DATA AND METHODOLOGY

The data used in this report comes from BerkeleyBase, the definitive public database of UC Berkeley-incubated startups created by Ruo Chen Huang and maintained by Startup@BerkeleyLaw. As of this writing, the database is tracking over 430 startups. The database can be located at www.law.berkeley.edu/experiential/startupberkeleylaw/entrepreneurs/berkeleybase/.

All of the following analysis is based on known public data available during this timeframe, and only incorporates companies that have been identified as UC Berkeley-incubated startups, as defined below.

As of this writing, BerkeleyBase is actively updated, and sources its data from news publications and community input.

KEY DEFINITIONS

UC Berkeley-incubated startup: For the purposes of this report, this is defined as a company that:

- 1 Has been founded by at least one UC Berkeley student, alum, faculty, staff, postdoc researcher, or visiting scholar;
- 2 Has participated or is participating in one or more of the following campus incubator or accelerator programs prior to December 2017: CITRIS, Cyclotron Road, Free Ventures, The House Residency and The House Fund (collectively, “The House”), Launch, QB3, and Skydeck;
- 3 Has an estimated private market valuation of under US\$1 billion, as of this writing; and
- 4 Was founded between January 2013 and December 2017.

ECOSYSTEM OVERVIEW

Startup@BerkeleyLaw supports startups across multiple verticals, providing resources for students, staff, and faculty from across the UC Berkeley campus. While hundreds of startups have been started by UC Berkeley alumni in the last few decades, this report focuses on startups that have participated in the seven Berkeley-affiliated accelerator and incubator programs described on this page, which are generally identified as the leading campus accelerator and incubator programs.



CITRIS

CITRIS Foundry is the University of California accelerator for founders building deep technology companies.

cyclotronroad

CYCLOTRON ROAD

Cyclotron Road is a two-year entrepreneurial fellowship program for top technical founders from around the world, hosted at Berkeley Lab and UC Berkeley.



FREE VENTURES

Free Ventures is a UC Berkeley student-run startup launchpad for students offering funding, mentorship, college unit credit, and other resources.



THE HOUSE

The House is a UC Berkeley-based startup institute that provides support to local entrepreneurs through their venture fund (The House Fund) and their accelerator programs.



LAUNCH

LAUNCH is a UC Berkeley startup accelerator that aims to support startups from ideation to market-ready companies through a rigorous three-month curriculum and mentorship.



QB3

QB3 is a University of California hub helping bio-entrepreneurs launch companies. The Institute consists of five incubators, two seed-stage venture capital firms, and an initiative in medical devices.

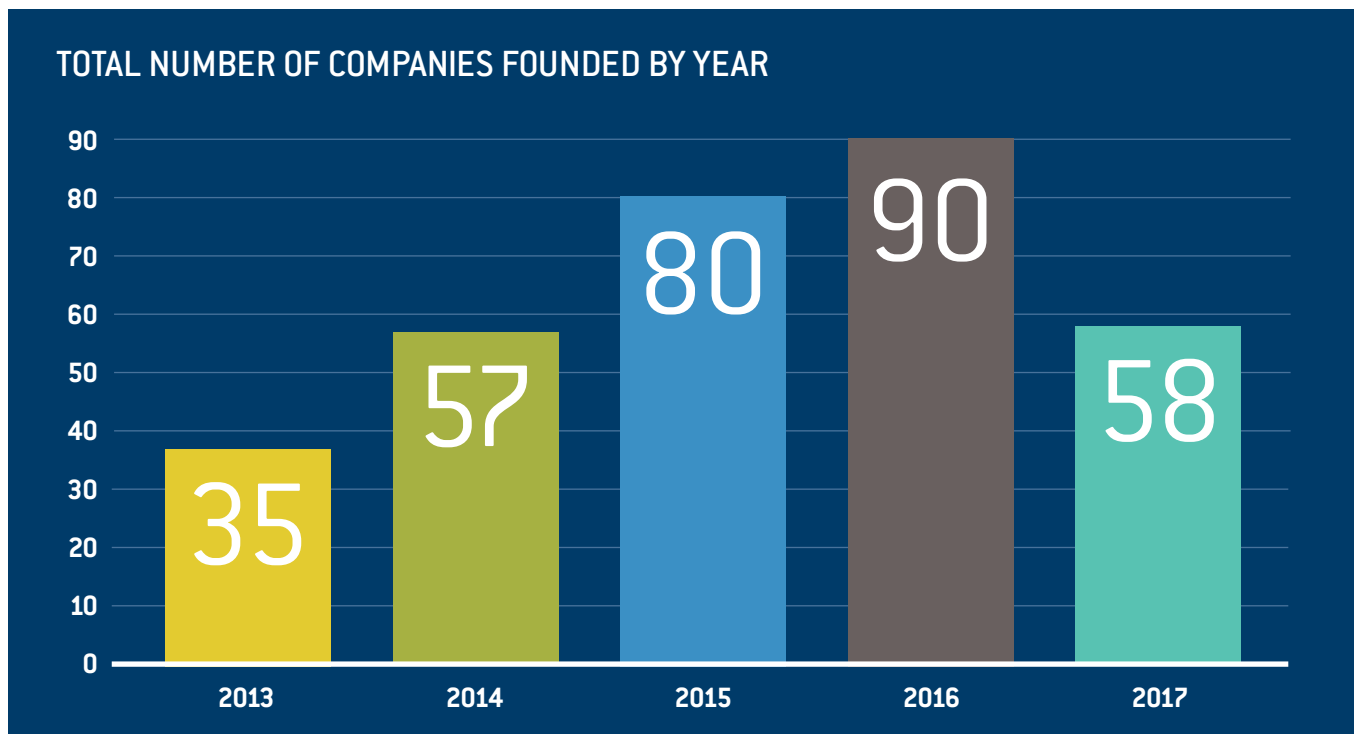
S K Y D E C K

SKYDECK

Skydeck is a UC Berkeley startup accelerator formed in partnership between the Office of the Vice Chancellor for Research, the Haas School of Business, and the College of Engineering.

ECOSYSTEM OVERVIEW

OVER 320 UC BERKELEY-INCUBATED STARTUPS WERE FOUNDED BETWEEN 2013 AND 2017¹



NUMBER OF COMPANIES SUPPORTED SINCE 2013²



cyclotronroad

41³

21



CITRIS Foundry

48



The House

36⁴



LAUNCH
The University of California's Startup Accelerator

61⁵



qb3

26⁶

SKYDECK

225

¹ In the 2017-2018 edition of the PitchBook Universities Report, 961 UC Berkeley companies were identified that had received a first round of venture funding between January 1, 2006 and August 18, 2017. These numbers are larger than those reported here because PitchBook covers a longer timeframe and utilizes a more expansive definition of a UC Berkeley company. Nevertheless, this Report's count of 320 UC Berkeley startups suggests that at least a third of the companies identified by Pitchbook as having received venture funding also received support from one or more of the identified UC Berkeley accelerator and incubator programs.

² These include companies from their 2013 cohorts onwards through December 2017. They total 458 because some companies are affiliated with multiple programs. In addition, unless otherwise indicated, the numbers are based on public information.

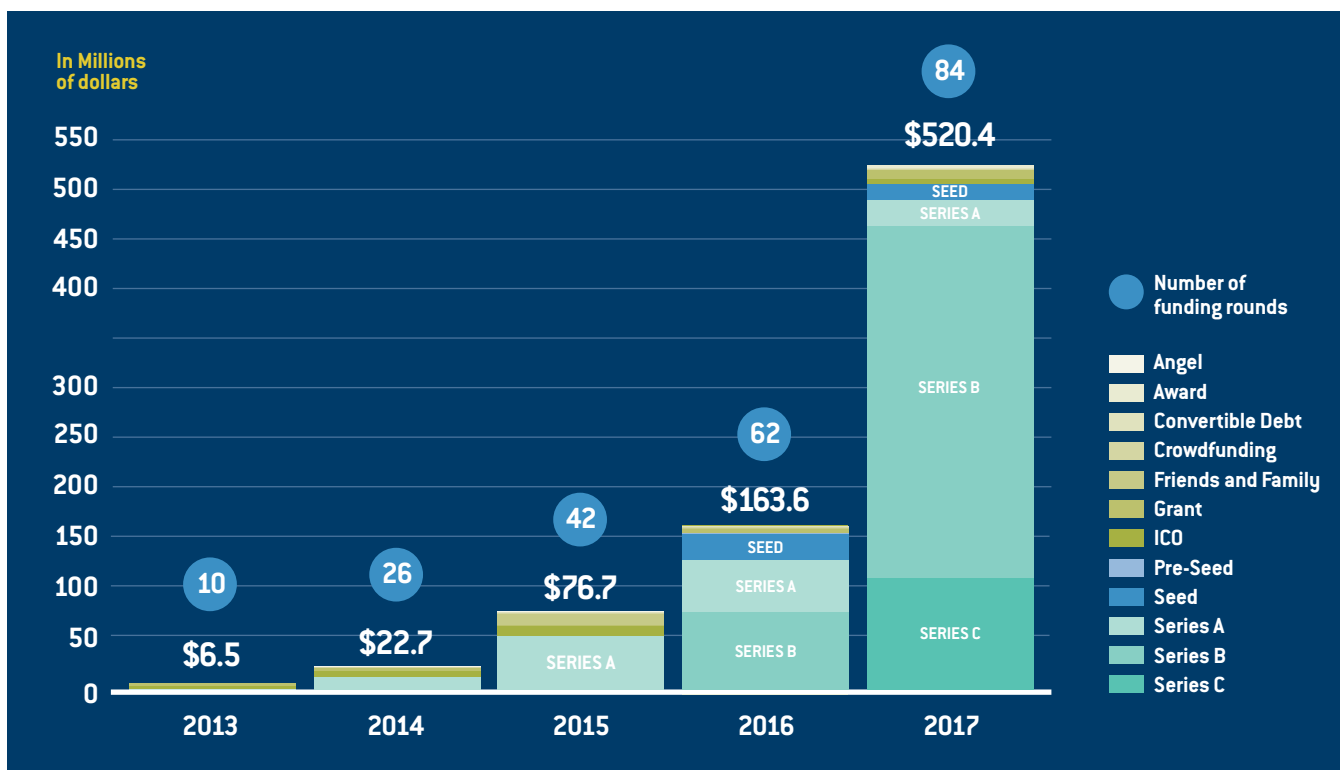
³ The analysis that follows is based on the 41 startups that were identified through public information. CITRIS Foundry reports that it has supported 48 startups since 2013. The information from these startups will be incorporated in the next annual report.

⁴ Because The House has a private portfolio, these numbers represent known companies based on public information.

⁵ In 2015, LAUNCH pivoted towards an accelerator model. This report only analyzes companies since that pivot.

⁶ For the purposes of this report, our dataset only tracks and analyzes the 26 startups that were identified as part of the UC Berkeley arm of QB3. QB3 reported that it supported 77 UC Berkeley affiliated startups. The information for these additional startups will be incorporated in the next annual report.

SINCE 2013, INVESTORS HAVE POURED NEARLY \$790 MILLION INTO UC BERKELEY-INCUBATED STARTUPS



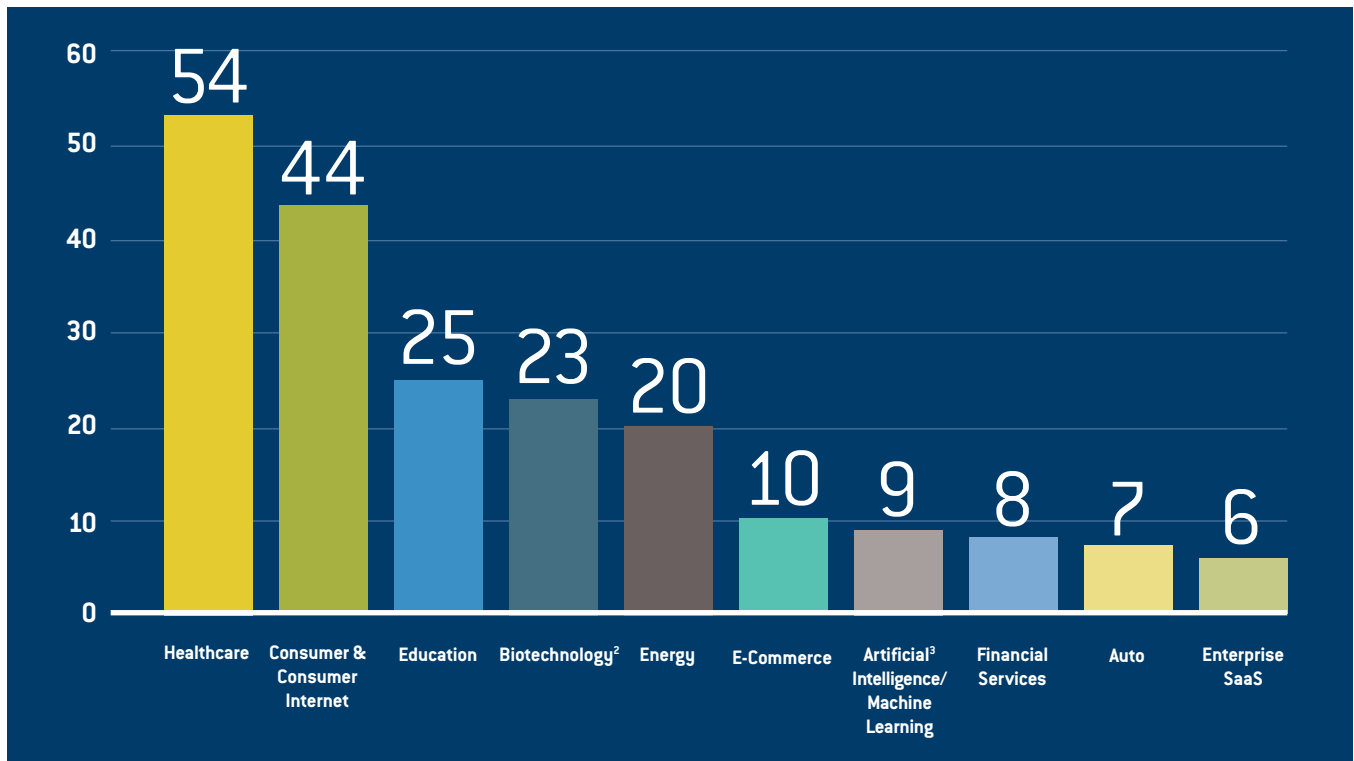
Over the past five years, private financing of UC Berkeley-incubated startups has grown exponentially, consistent with the growing number of startups. Overall, aggregate private financing of UC Berkeley-incubated startups has grown from \$6.5 million in 2013 to over \$520 million in 2017.

The growing number of UC Berkeley-incubated startups and their financing can also be attributed to the addition of new UC Berkeley-specific resources, such as the launch of The House and Cyclotron Road, as well as a general state-wide shift towards supporting entrepreneurship, most recently with Assembly Bill 2664, in which the State of California approved a \$2.2 million allocation to all 10 of the UC campuses for the purpose of supporting innovation and entrepreneurship.

Note: \$790M accounts for funding rounds where a funding date could be identified up until December 2017, but the amount is higher if funding rounds without a funding date are included.

KEY SECTOR TRENDS

HEALTHCARE STARTUPS ARE THE MOST REPRESENTED, FOLLOWED BY CONSUMER, E-COMMERCE, EDUCATION, BIOTECHNOLOGY, AND ENERGY¹



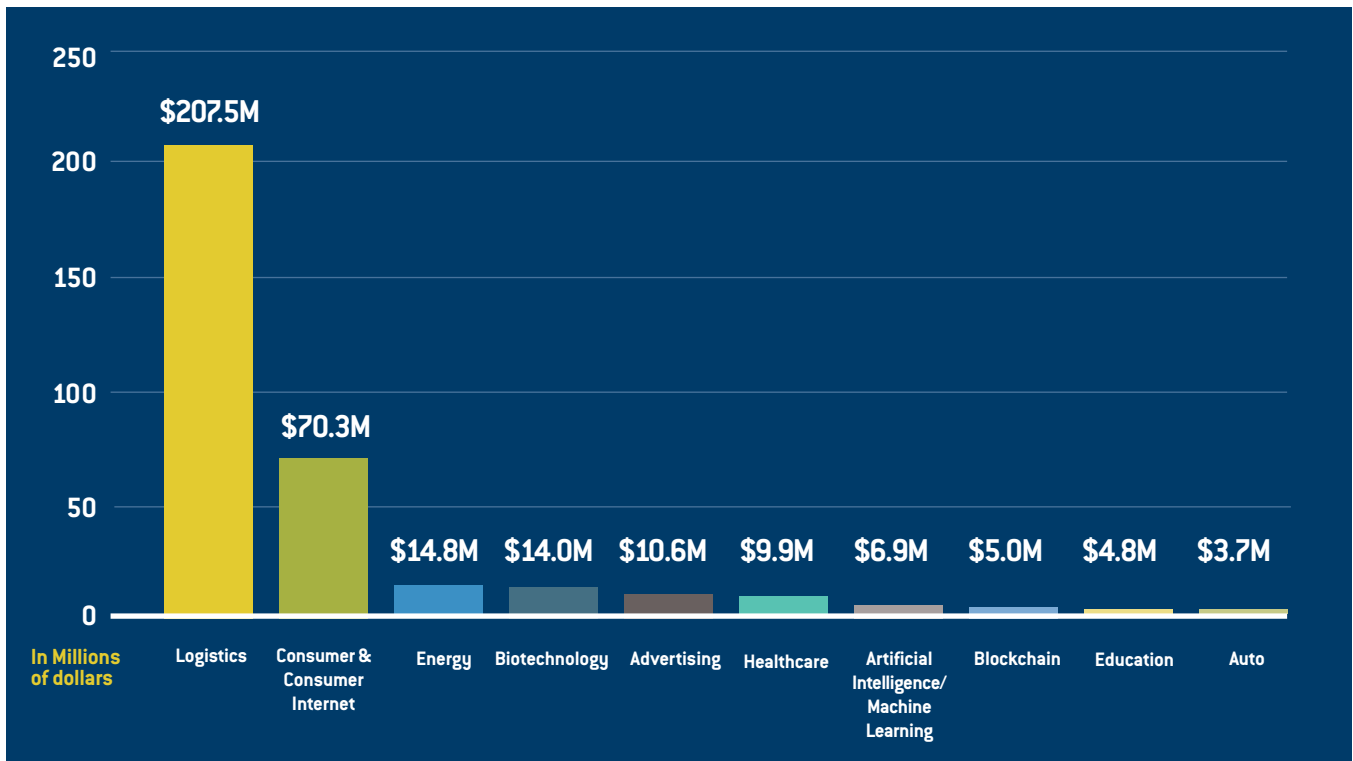
In addition to typical startups in the Consumer and E-Commerce sectors, UC Berkeley specializes in providing comprehensive resources for startups pursuing research-intensive ideas, especially in Biotechnology, Blockchain, Energy, and AI/ML. For example, Cyclotron Road and QB3 are both programs that are geared towards supporting entrepreneurs in the Energy and Biotechnology sectors respectively, and the Berkeley Center for Law and Business has organized several executive education academies on blockchain technology.

¹ The full list of sectors are as follows: Advertising, Agriculture, Artificial Intelligence/Machine Learning, Auto, Biotechnology, Blockchain, Consumer/Consumer Internet, E-Commerce, Education, Energy, Enterprise/Enterprise SaaS, Entertainment, Financial Services, Hardware, Healthcare, Logistics, Real Estate, Software. For reporting purposes, we exclude startups classified as general Hardware and Software [e.g., if a company develops software but does not fit within another sector, such as Healthcare, they would be only classified as Software].

² Although biotechnology and healthcare startups can have significant overlap, these were generally classified either by self-identification by the startups or by determining whether it focused more on consumer applications (healthcare) or research (biotechnology).

³ AI/ML companies were classified as those developing AI technology or where it is a primary tool of the startup.

FOCUSING ON FUNDING BY INDUSTRY, FUNDING AMOUNTS REFLECT THE PRESENCE OF OUTLIERS, AS WELL AS THE INDUSTRY DISTRIBUTION OF UC BERKELEY-INCUBATED STARTUPS

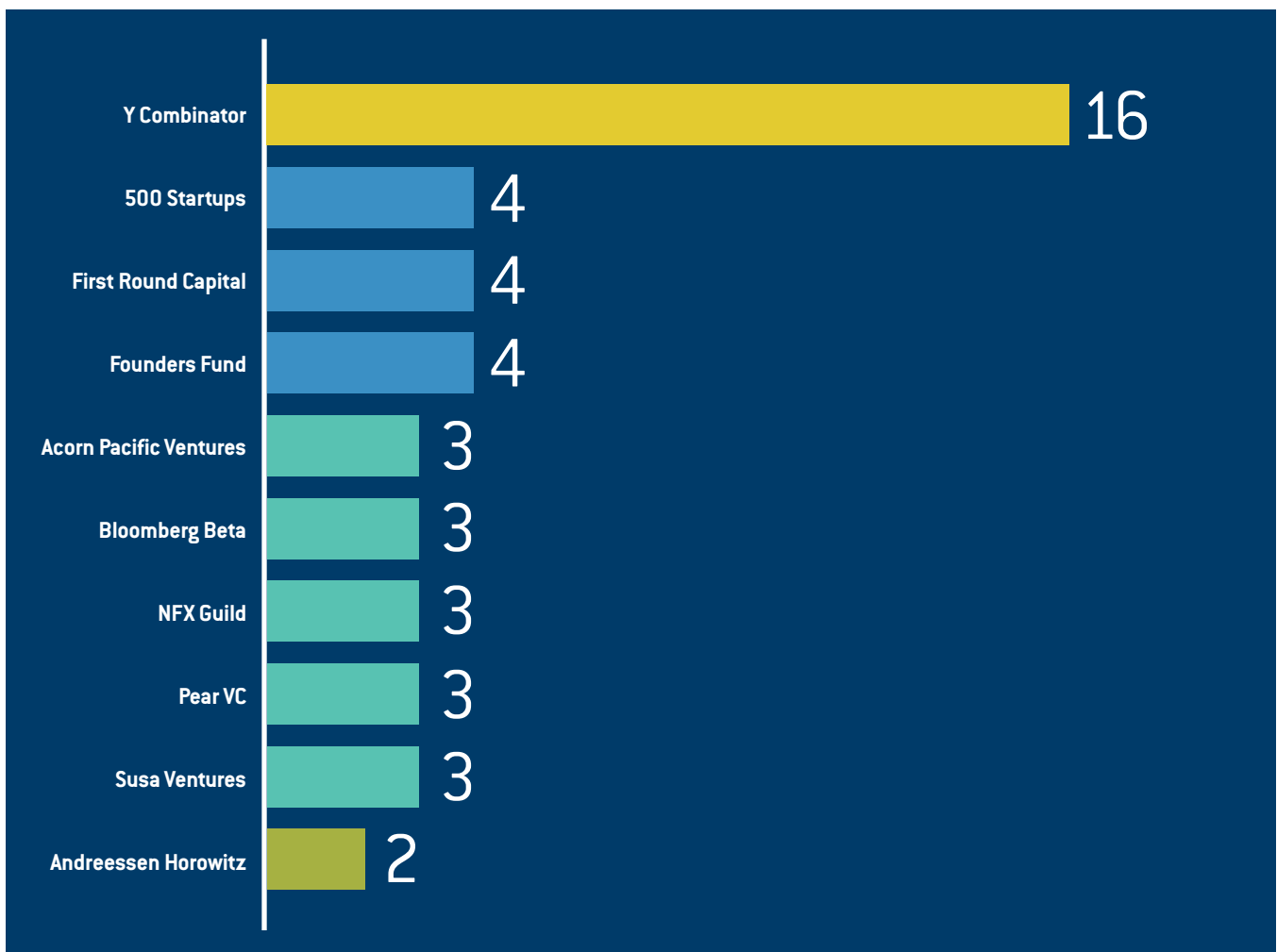


Funding for logistics and consumer/consumer internet companies seem to far outpace that of other sectors, but the high numbers are due to large financings of specific companies in these two industries. In Logistics, for instance, The House-affiliated Flexport raised approximately \$201 million in funding.

Taking this into account, funding trends generally align with the density of startups presented on p. 8.

VENTURE CAPITAL

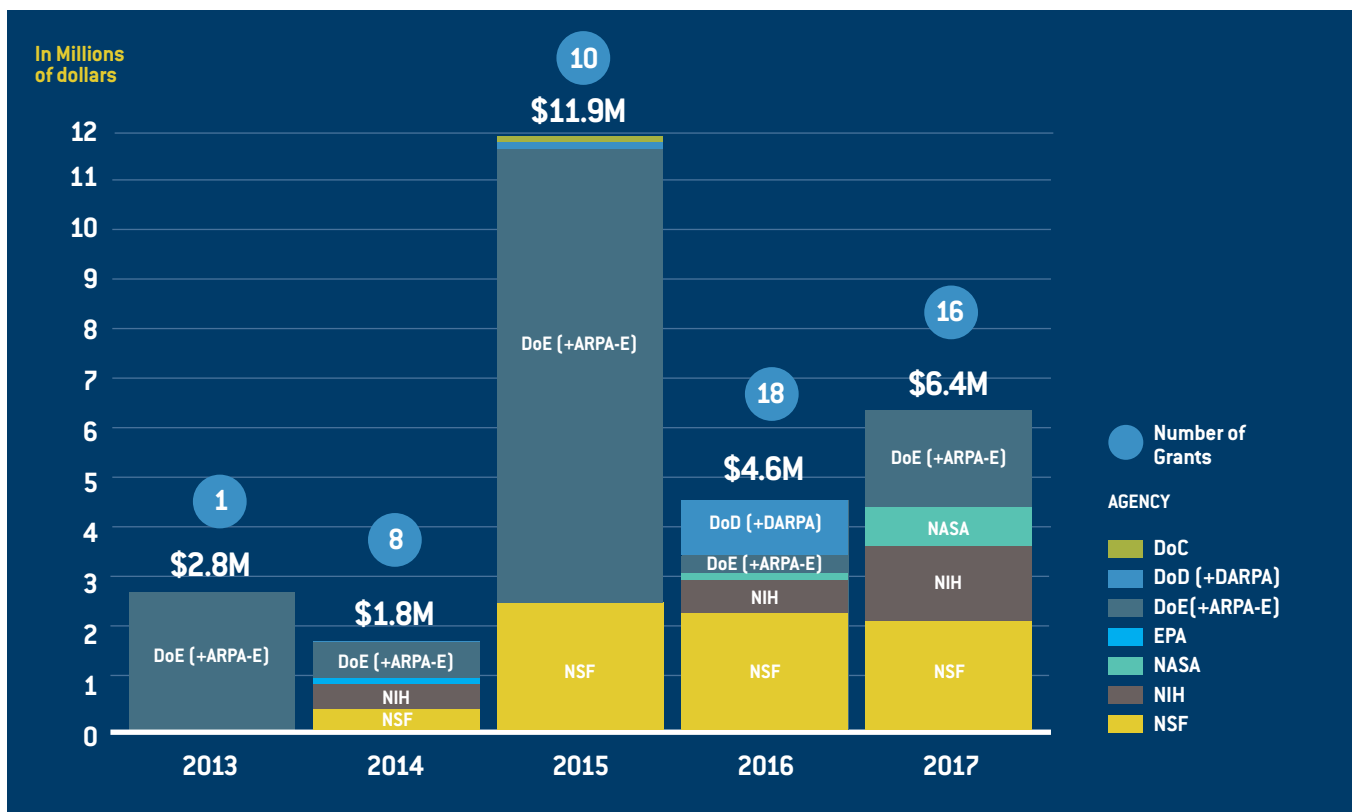
AMONG INVESTORS FUNDING UC BERKELEY- INCUBATED STARTUPS, Y COMBINATOR LEADS WITH 16 INVESTMENTS



UC Berkeley accelerator and incubator programs, as well as Startup@BerkeleyLaw's FORM+FUND Program, aim to prepare their portfolio startups for success beyond UC Berkeley. Indeed, it is common for these startups to participate in and to receive funding from seed stage firms such as Y Combinator and 500 Startups. This strong showing in these global programs is a testament to both UC Berkeley's network and quality of entrepreneurs. Details regarding the companies that received financing from these investors can be found at BerkeleyBase, maintained by Startup@BerkeleyLaw.

SMALL BUSINESS INNOVATION RESEARCH GRANTS (SBIR)

53 SBIRS HAVE BEEN AWARDED ACROSS ALL AGENCIES SINCE 2013, REFLECTING UC BERKELEY'S LEADERSHIP IN R&D



Many UC Berkeley-incubated startups spin out of research projects and labs, and instead of first turning to venture capital, they apply for government grants. Some startups choose this trajectory because their innovation may not fit within the typical venture capital model, or because their idea is not yet ready for commercialization.

Nearly all SBIR-granting U.S. agencies are represented, with a heavy lean towards funding energy-related and non-medical science companies.

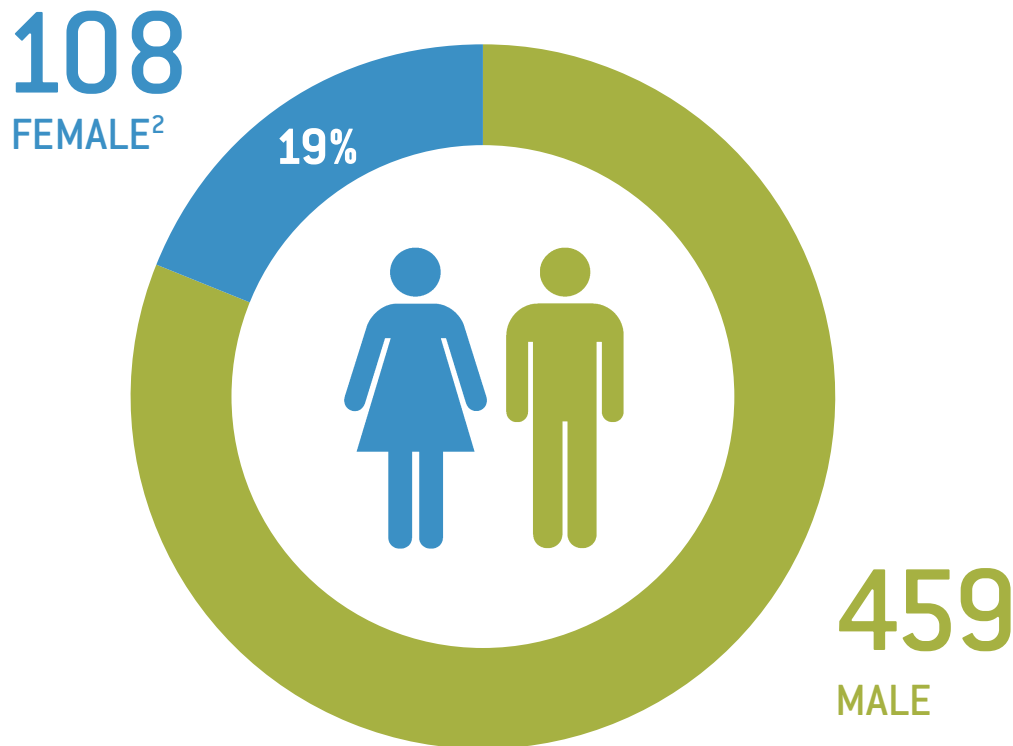
SMALL BUSINESS INNOVATION RESEARCH GRANTS (SBIR)

WHILE THE NATIONAL SCIENCE FOUNDATION HAS AWARDED THE MOST AGENCY GRANTS, THE DEPARTMENT OF ENERGY'S ARPA-E TAKES THE FUNDING LEAD WITH OVER \$10 MILLION IN GRANTS

	NUMBER OF GRANTS BY AGENCY	AMOUNT OF GRANT FUNDING BY AGENCY
NSF	24	\$7,524K
DOE (+ARPA-E)	13	\$14,876K
NIH	7	\$2,673K
DOD (+ DARPA)	5	\$1,330K
NASA	2	\$862K
DOC	1	\$100K
EPA	1	\$100K

Since 2013, over \$27 million in SBIR grants have been awarded to UC Berkeley-incubated startups in order to pursue ideas ranging from a nano-robotic molecule delivery system (Mekonos) to harnessing ocean waves for electricity (CalWave) to designing next-generation high-performing batteries (Cuberg).

19% OF UC BERKELEY-INCUBATED FOUNDERS ARE FEMALE



We explore the demographic trends of UC Berkeley-incubated startups using an algorithmic matching protocol. In this inaugural report, we focus on gender diversity. Of the 638 founders whose names could be algorithmically matched to a gender¹, 19% were identified as female. This figure is slightly higher than the industry average, where only 16% of startups have a female founder, according to CrunchBase³.

¹ Using the 'gender' R Statistical Package, a founder's first name was matched with Social Security records from 1940 to 2012, and their gender was predicted algorithmically based on the majority proportion of people with that first name. *Citation: Lincoln Mullen (2015). gender: Predict Gender from Names Using Historical Data. R package version 0.5.1.*

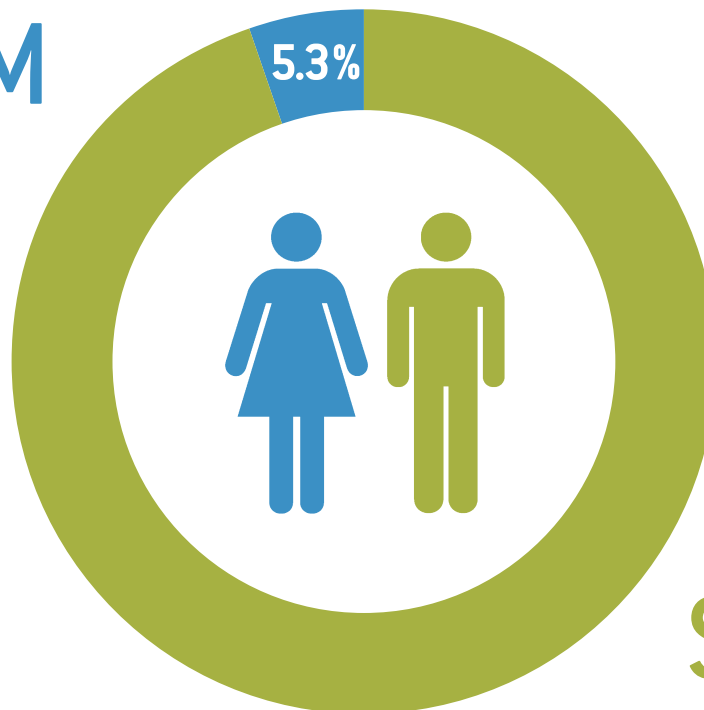
² <https://news.crunchbase.com/news/portion-vc-backed-startups-founded-women-stays-stubbornly-stagnant/>. In contrast, the 2017-2018 edition of the PitchBook Universities Report identified 115 UC Berkeley female founders that received a first round of venture funding between January 1, 2006 and August 18, 2017.

DEMOGRAPHIC TRENDS

HOWEVER, COMPANIES WITH AT LEAST ONE FEMALE FOUNDER COMPRISE ONLY 5.3% OF TOTAL VENTURE FUNDING OF UC BERKELEY-INCUBATED STARTUPS

\$41.7M

AT LEAST ONE
FEMALE
FOUNDER



\$751.7M

MALE-ONLY
FOUNDED

We also explore funding raised among female-founded companies.

For female-only founded companies, total funding raised from 2013 to 2017 was \$7.25 million, which is 1% of the total amount. In contrast, female-male founded companies have raised 4%, comprising \$34.47 million. Excluding companies that have raised more than \$100 million, these percentages are 3% and 13% respectively.

Comparatively, the total global amount of funding that went to female-only and female-male founded companies in 2017 was 3% and 10%, respectively, according to CrunchBase.

Over the past five years, UC Berkeley has developed into a thriving locus of entrepreneurship where forward-thinking ideas converge with impact-focused founders, students, and faculty. This insatiable passion to create meaningful change on a global scale is perhaps one of UC Berkeley's greatest strengths. In this report, we have tracked several notable trends that have shaped this ecosystem, focusing specifically on startups affiliated with a UC Berkeley entrepreneurship program.

As noted, we focus on this narrow definition of a UC Berkeley-incubated startup to permit a detailed analysis of the trends shaping entrepreneurship at UC Berkeley. It is worth emphasizing, however, that the impact of the campus on entrepreneurship is far greater than the companies covered in this report. Indeed, over 1,000 UC Berkeley alumni have gone on to found over 880 companies, according to Pitchbook. This includes highly valued “unicorns”, such as Cloudera, Nextdoor, and Warby Parker, as well as technological legacies such as Apple, Intel, and Qualcomm.

Even with the narrow definition we use for a UC Berkeley-incubated startup, it is clear that the campus' culture of innovation and entrepreneurship is alive and well. As this report reveals, campus startups are growing in number and attracting significant amounts of outside financing and government grants.

More generally, the thriving ecosystem is likely both a product of and an inducement for the growing number of campus resources that are designed to facilitate campus entrepreneurship. Today at UC Berkeley, an entrepreneur can easily grow their startup from ideation to incorporation, all within the ecosystem. For example, a UC Berkeley student can learn about topics in entrepreneurship and venture capital at Haas, pitch and develop their idea at Skydeck, learn about finance and management at FORM+FUND, and successfully incorporate their company with the help of Startup@BerkeleyLaw's services and workshops.

We look forward to following and tracking the trends of this exciting ecosystem in the years ahead.

STARTUP AND VENTURE CAPITAL TRENDS AT THE UNIVERSITY OF CALIFORNIA, BERKELEY

CONTRIBUTORS

ROBERT BARTLETT

Robert Bartlett is Professor of Law at UC Berkeley and Faculty Co-Director of the Berkeley Center for Law and Business. Bartlett is also a founder and program co-director of Startup@BerkeleyLaw—UC Berkeley's primary platform for training entrepreneurs and investors on legal, financial and operational issues confronting early stage companies. Prior to his academic career, Robert worked as a corporate associate for Gunderson Dettmer, a leading law firm focused on start-up and venture capital finance transactions.

Professor Bartlett has written widely in the area of law and finance, with a particular emphasis on venture capital finance, market structure, and securities regulation. He is also the academic representative for the General Counsel Advisory Board of the National Venture Capital Association (NVCA) Model Document Working Group, which is responsible for drafting and maintaining the NVCA's model documents for venture capital financing transactions. At Berkeley, Robert teaches Corporate Finance, Securities Regulation, and Venture Capital Finance.

DEBORAH KANG

Deborah Kang is the Director of Startup@BerkeleyLaw, where she educates and supports startups and investors from across the UC Berkeley campus, Silicon Valley, and beyond. At UC Berkeley, Deborah manages and instructs in the FORM+FUND Certificate Program, Berkeley Venture Capital Academy and more. Prior to joining UC Berkeley, Deborah was an attorney at the Silicon Valley law firm Fenwick & West.

ADAM STERLING

Adam Sterling is the Executive Director of the Berkeley Center for Law and Business at Berkeley Law and co-founder of Startup@BerkeleyLaw. Previously he was a startup and venture capital attorney at Gunderson Dettmer and the co-founder and director of the Conflict Risk Network. Adam currently co-teaches Blockchain, Cryptoeconomics, and the Future of Technology, Business and Law at the University of California, Berkeley. His writings and work have appeared extensively in the press; including contributions to the *Wall Street Journal*, *Financial Times*, *New York Times*, *Los Angeles Times*, *San Francisco Chronicle*, and *National Public Radio*. He has appeared on a number of broadcast news programs, including CNN's Situation Room and CNBC's Street Signs.

PREPARED BY:

startup@
BerkeleyLaw

UNIVERSITY OF CALIFORNIA