




# ILLINOIS INNOVATION INDEX

## 2022 University Entrepreneurship Report

Universities Drive New Venture Creation

Powered by  ILLINOIS SCIENCE &  
TECHNOLOGY COALITION

Sponsored by **USG** 

# INTRODUCTION

The Illinois Science & Technology Coalition's University Entrepreneurship Index report has tracked business creation and startup success on Illinois campuses for the last 12 years. This year's publication also features startups created during the COVID-19 pandemic. As universities moved to remote learning in 2020 and 2021, there was a considerable yet understandable slowdown of startup creation. However, universities continued to provide the support necessary to create a thriving entrepreneurial climate in the state. Our survey covers entrepreneurial endeavors pursued by faculty, staff, professors, and students across our 11 partnering institutions of higher education in Illinois. This survey does not include sole proprietorships or small businesses formed by the alumni of these universities.

- [See Index Methodology here](#)

## KEY FINDINGS

- The five-year period between 2018-2022 shows the impact of the pandemic on a generation of startups at Illinois universities

- Of all the university-supported startups, **15.3% were in the biomedical sector**



- Our collection found that **university-supported startups created 2,281 new jobs** over the last five academic years



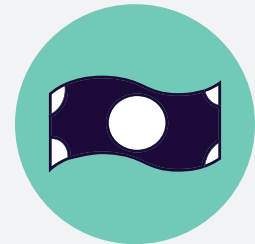
- Of the jobs created by these small businesses, **73.65% remain active**

- 75.7% of active jobs created by university-supported startups **remain in Illinois**

- 17% of jobs created by retail startups over the last five years have since gone inactive

- Direct university funding recipients are **more likely to remain active and attract follow-on funding** than the general population of founders

- On average, for every dollar a founder received in university awards or prizes, they could expect **nearly \$14 in additional VC funding**



- I-Corp participants are more likely to remain in state and active



- There has been a **record number of women-founded startups**

- Startups featuring **diverse founders were more likely to remain active** and attract funding than other startups

- Annual Invention Disclosures and License Agreements rise in Illinois

- Illinois led the nation in **licensing revenue** over the last five years



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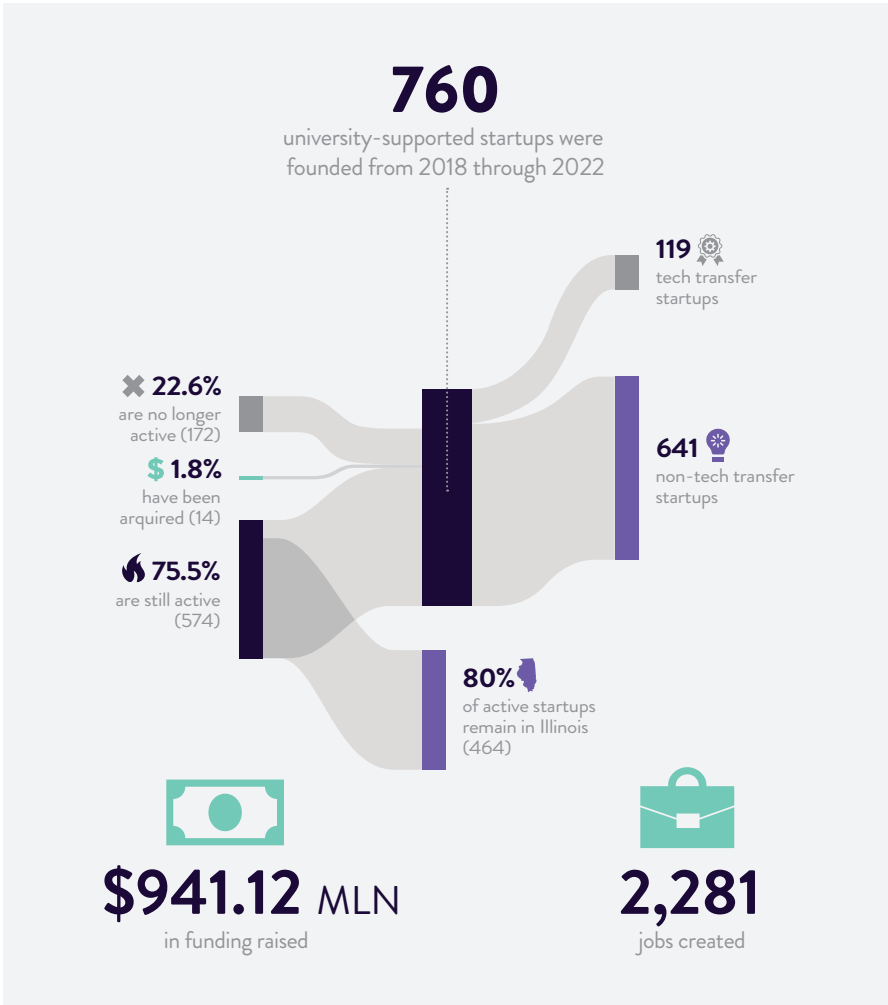
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## Startup Overview

2018 to 2022



Source: ISTC University Entrepreneurship Survey

# STARTUP CREATION

## Startup activity slows in the midst of COVID-19

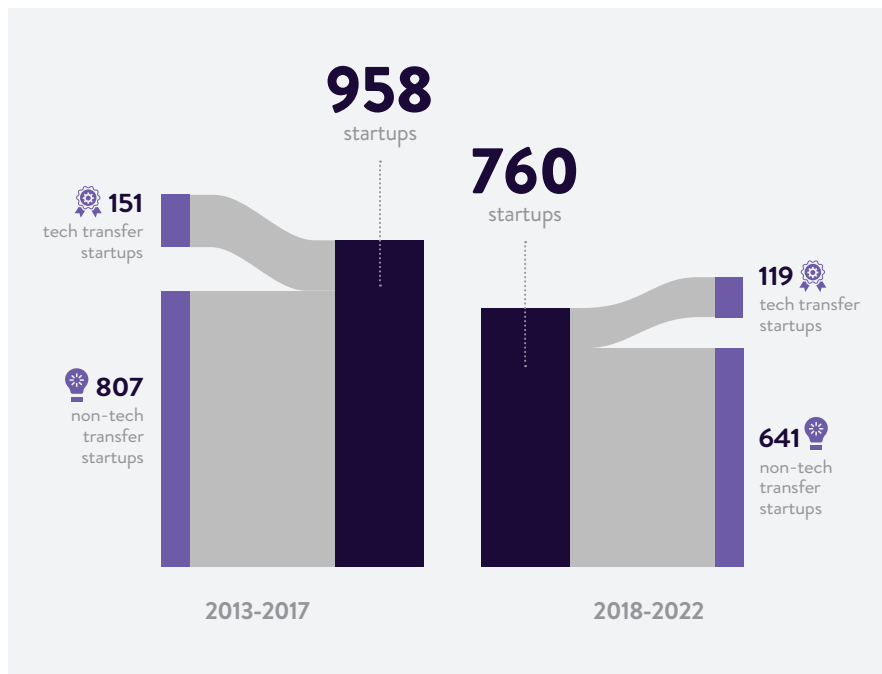
Over the last five academic years (2018 to 2022), 760 startups were created at Illinois campuses. In the previous five-year period (2015-2019), 1,064 startups were created at Illinois universities. This reflects a 26.6% decrease.

The 2019-2020 academic year was an especially slow year in which only 121 startups were created, suggesting that the onset of COVID-19 prevented many would-be entrepreneurs on university campuses from getting their businesses off the ground. Our previous reports show averages of 190 startups per year.

The ISTC University Entrepreneurship survey results for 2022 reflect a drop in startup creation for student founders and for small businesses that choose to license university technology. ISTC refers to these businesses as "tech transfer" startups. Of the 760 small businesses and fledgling enterprises formed on Illinois campuses between Academic Year 2017-2018 and Academic Year 2021-2022, 15.7% (119) attempted to commercialize university intellectual property (IP).



### Startup Activity by Period



Source: ISTC University Entrepreneurship Survey



▲ Hot Hut Outdoors Takes home Second Place Prize at Regions Bank Business Plan Competition hosted by the Southern Illinois University Research Park



## A HOT HUT TENT MADE FOR HUMID ENVIRONMENTS

SIU Professor Andrew Croxell is a lifelong adventurer and faculty member in the University's business school. During a backpacking trip he was well-prepared for, Croxell ran into a problem when condensation build-up led him to end his trip early. An overly-humid tent can cause breathing problems and make getting restful sleep on the trails nearly impossible.

Because of the dilemma, Croxell decided to use his design-thinking and problem-solving skills to create a tent that would be impervious to condensation build-up. Improving upon the design of other tents on the market, he created "Hot Hut," a tent that reduces condensation build-up in the humid conditions of southern Illinois. Hot Hut Outdoors received the second place prize in the inaugural [Region's Bank Business Plan Competition](#) and received a \$3,000 award at the SIU Research Park's Innovation and Entrepreneurship Showcase on Dec. 2, 2021.

Comparably, from 2013 to 2017 ISTC's survey captured 958 startups created on Illinois campuses; 15.8% (151) were tech transfer. Our 2022 survey results suggest that both tech-transfer startups and non-tech transfer startups formed at a slower rate between 2018 and 2022.

The creation of non-tech transfer startups, which are considerably more likely than tech transfer startups to be created exclusively by students, slowed considerably during the most recent five-year period in our survey. Between 2012 and 2019, an average of 159 non-tech transfer startups were formed each year, but that average decreased between Academic Year 2019-2020 and Academic Year 2021-2022 to 110.

This lull due to the pandemic, while disappointing, is impactful when utilized. Support staff provide assistance across the state at places like the Polsky Center at The University of Chicago, The Garage at Northwestern, the Kaplan Institute at the Illinois Institute of Technology, and the University of Illinois Technology Entrepreneur Center in Urbana-Champaign. These centers often provide student entrepreneurs with workspace, incubation programming, mentorship, technical assistance, equipment, access to capital, and more.

To date, 574 university-supported startups remain active out of the 760 formed in the last five years (75.5%). This percentage of continued activity is considerably higher than what was reported in our previous collection effort—59.4%—following the 2018-2019 Academic Year. There were 172 (22.6%) startups that were formed and went inactive within the last five academic years, while 14 (1.8%) have been acquired. Of the startups that remain active, 464 (80.4%) continue their operations in Illinois, with only 110 active university-supported startups moving outside the state.



▲ WeHearYou LLC Team featuring Founder Pierre Paul holding award



## INTERPRETING ASL WITH A PHONE CAMERA & OPENING DOORS

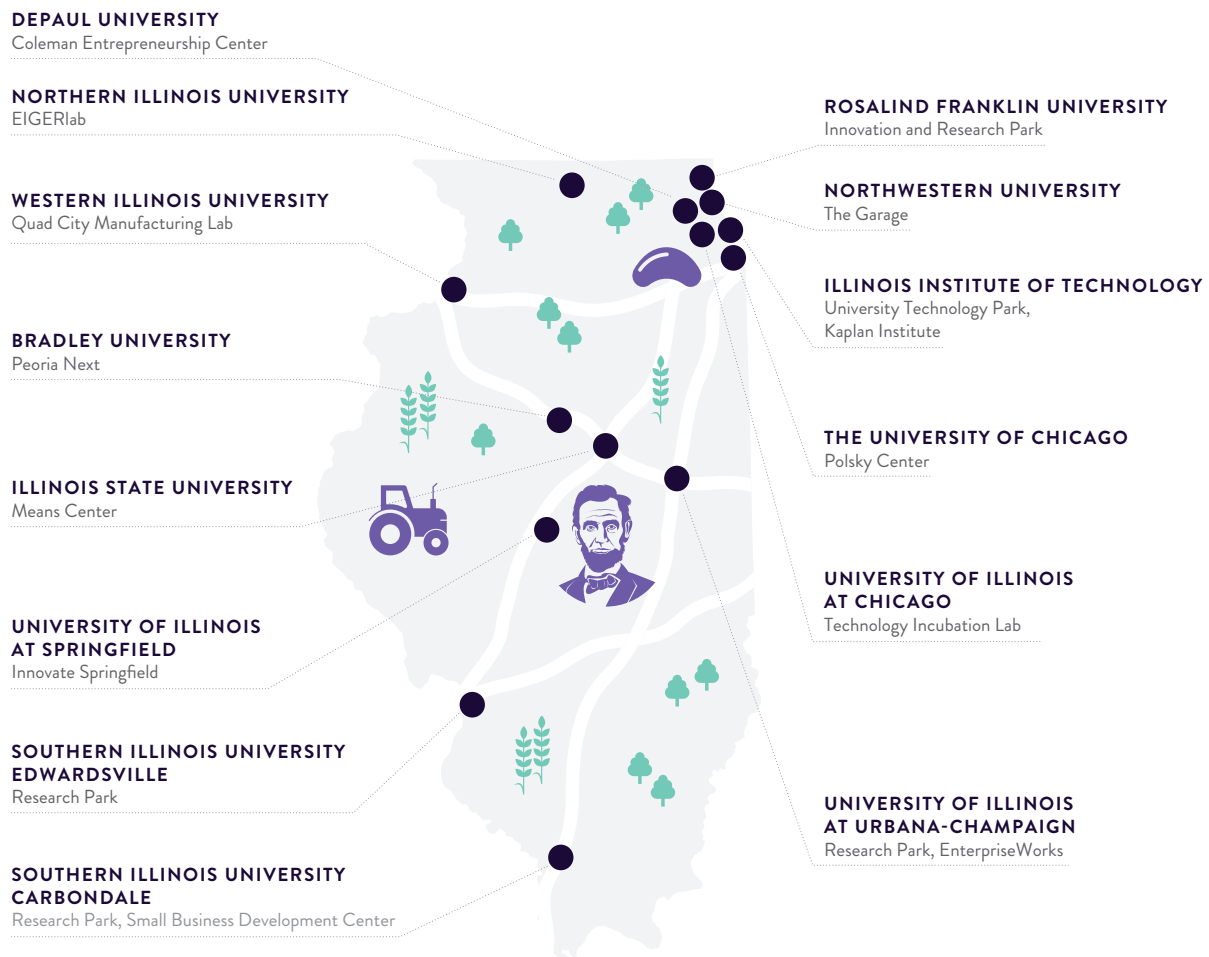
People living with hearing impairments often face barriers in communicating with others. Only 500,000 people in the United States are familiar with American Sign Language. [We Hear You LLC](#) is a startup created by Bradley University graduate student Pierre Paul to interpret sign language via a cellular device with a camera. They report that their software is nearly 99% accurate with ASL fingerspelling and 97% accurate for full gesture translation. In places where ADA compliance is not required, like grocery stores and concert venues, there is a gap for those with hearing loss. The innovative nature of their product won the top prize at Bradley University's Big Idea competition in 2020 and received \$8,000 in direct funding. They have not slowed down their development, even amid the COVID-19 pandemic, and have begun looking at new ways to assist interpreters and individuals with hearing loss.

This year We Hear You moved into a new market, seeking to serve individuals with mobility exceptionalities. Their new product, the [Push Button Mobility Add-on](#), is compatible with remotely opened doors. This Push Button will allow doors to be accessed from safe distances, assisting those who are worried about social distancing while also making buildings more accessible to those with mobility impairments.

## University Entrepreneurship Centers and Tech Parks

Over the past decade, universities in Illinois have created and grown their own vibrant startup ecosystems. Some of these hubs have more than 50 staff members assisting the entrepreneur communities on these campuses.

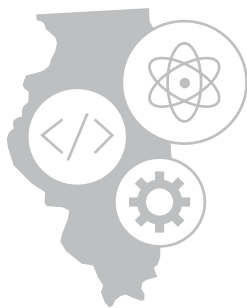
These ecosystems are anchored by university-affiliated incubators and entrepreneurial hubs—including Bradley University's [Peoria NEXT Innovation Center](#); Illinois State University's [Means Center](#); Illinois Tech's [University Technology Park](#) and [Kaplan Institute](#); Northern Illinois University's [EIGERlab](#); Northwestern's [The Garage](#); Southern Illinois University Carbondale's [Research Park](#) and [Small Business Development Center](#); Southern Illinois University Edwardsville's [University Park](#); The University of Chicago's [Polsky Center](#); University of Illinois at Chicago's [Technology Innovation Lab](#); University of Illinois Springfield's [Innovate Springfield](#); University of Illinois at Urbana-Champaign's [Research Park](#) and [EnterpriseWorks](#) incubator; and DePaul University's Coleman Entrepreneurship Center. Several of these hubs have expanded their facilities in recent years to encourage more research and innovation.





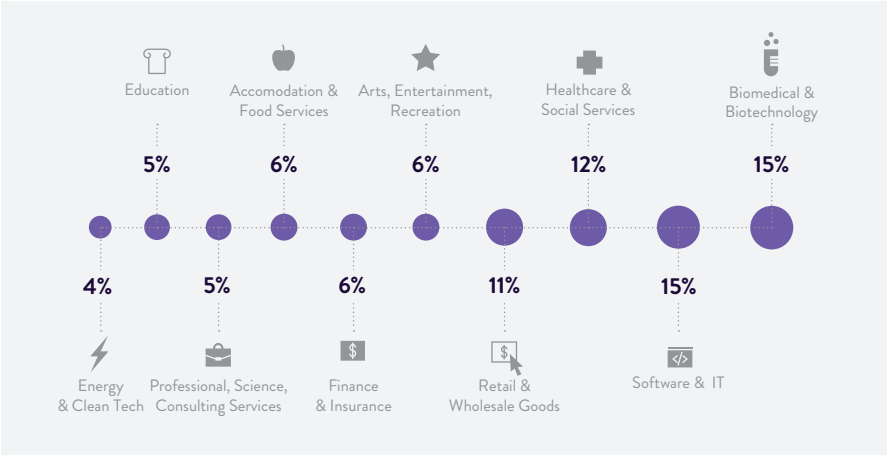
Biotech continues to lead in startup creation

Immunologic and therapeutic research continues to drive innovation and entrepreneurship within Illinois universities. The biomedical research sector led all industry fields with 115 associated university-supported startups created over the last five years. There is more diversity in the sectors where these startups have formed companies compared to the 2020 University Entrepreneurship Index. In 2020, ISTC reported that just under half of all startups were confined to three sectors: Biomedical and Bio-technology, Software and Information Technology, and Healthcare/Social Services. Between 2018 and 2022, only 41.8% of startups (318) fell into these top three sectors—a 7-percentage point drop. Startups were more evenly dispersed through other fields in our survey like Retail (11.2%), Entertainment and Recreation (6.1%), Professional Consulting Services (5.4%), Food Services (5.7%), Finance and Insurance (5.7%), and Education (4.9%).



Startups by Industry  
Top 10 Industries  
2018 to 2022

Source: ISTC University  
Entrepreneurship Survey



Illinois is home to several premier medical research institutions, and these campuses serve as the midwestern hub for life science research in the United States. State and local authorities in Illinois, including the Department of Commerce and Economic Opportunity (DCEO) place an emphasis on this life science research. In October of 2021, Governor Pritzker announced \$15.4M in Rebuild Illinois Capital Funding to boost wet lab development which would aid in the creation of new university intellectual property and entrepreneurship opportunities. Biotech startups are considerably more likely to license university intellectual property (IP) for commercialization. In fact, nearly two-thirds (64.7%) of the tech transfer startups in our survey are in the biomedical or biotechnology industries. This represents an increase in the proportion of university entrepreneurs licensing technology for commercial enterprises in the biotech sphere relative to other sectors, from 56.7% in the 2020 Index to 64.7% this year. Seventy-seven biomedical tech transfer endeavors have been attempted over the last five academic years, and only eight have gone inactive, reflecting the great potential for commercialization within the pool of IP that Illinois universities harbor.



Entrepreneurs and researchers create jobs in Illinois

Within the last five academic years, our universities and their research affiliates helped spur the creation of 2,281 jobs across the country. University-supported startups create flexible and impactful roles, meaningful high-skill positions, and innovative ideas to push the state’s economy forward. Of those more than 2,200 jobs created, 73.7% remain occupied by an employee or founder, 10.8% have been discontinued, and 15.6% were acquired by a new entity. The retail sector had the largest number of jobs created that have since gone inactive, which can largely be attributed to the impact of the pandemic on retailers overall.

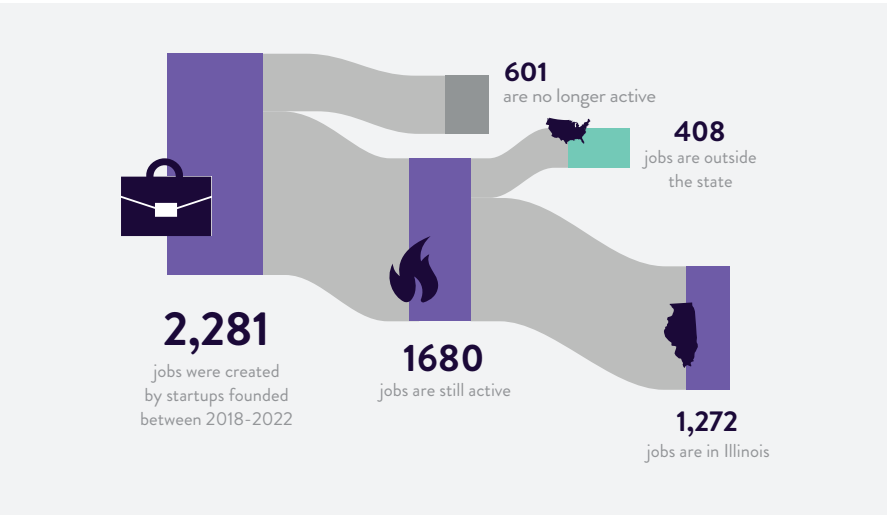
Despite the continued narrative that the most successful startups are those that leave the state to find funding elsewhere, most of the jobs created by active university-supported startups formed on Illinois campuses over the five years remain in Illinois. Our survey estimates that 75.7% of active jobs created by these small businesses remain in Illinois. While there are fewer overall active jobs in this collection than in years prior, a higher percentage of those active jobs created by Illinois university-supported startups remain in the state. Over the last five years, startups within the biomedical space have led the way in providing high-skill roles to Illinois residents, creating 553 new jobs; followed by IT and Software (296), Retail (180), and Healthcare (177).



Job Creation

2018 to 2022

Source: ISTC University Entrepreneurship Survey





▲ Grove Biopharma



▲ Professor Nathan Gianneschi, Ph.D.



Northwestern

## REPURPOSING NANO-MATERIALS FOR BIOMEDICAL APPLICATIONS

In 2020, [Grove Biopharma](#) was born out of the work conducted in the lab of professor Nathan Gianneschi, Ph.D. Professor Gianneschi and his students perform research on materials science and biomedical engineering in his lab. He has received numerous awards for his work on repurposing nano-materials for biomedical applications. Grove Biopharma is the result of years of research into novel materials and the potential use of those resources as a way of treating illnesses that do not yet have effective pharmaceutical treatments. Professor Gianneschi, along with co-founders Paul Bertin, Ph.D., and Dr. Geoffrey Duyk, Ph.D., has successfully created a protein-like polymer (PLP) biologic to target many diseases that currently have no adequate treatment solutions. The modality they have pioneered should open the door for more targeted treatment of certain cancers and other rare diseases.

Northwestern's biomedical engineering and materials science researchers have a proven track record of developing novel drug treatments. Commercialization success over the last decade indicates that the school's investment into translational space for researchers has been efficacious. Dr. Gianneschi is an elected member of the American Institute for Medical and Biological Engineering and a Professor of Chemistry at the Weinberg College of Arts and Sciences. He also holds a joint appointment at the McCormick School of Engineering and Applied Science. Grove Biopharma is part of a prestigious club of pharmaceutical success stories spun-out of multiple departments at Northwestern that include Lyrica, from a lab at the Weinberg College of Arts and Sciences, and Naurex, from a lab at the McCormick School of Engineering. During Grove's first seed funding round over the last year, they successfully raised \$10.5 million in additional capital to fund their clinical trials.

# FUNDING

## Startup funding slows from record high throughout 2015-2019

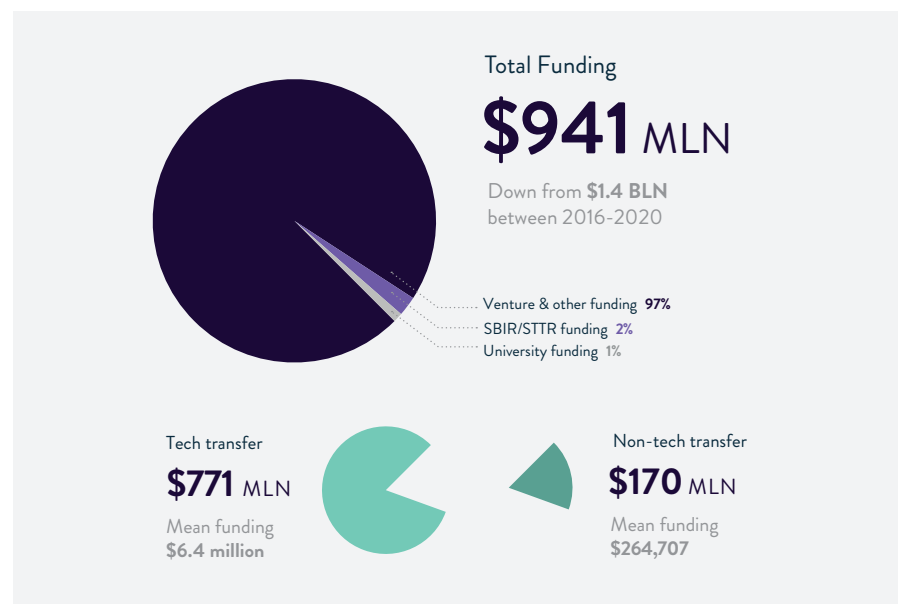
In the 2020 University Entrepreneurship Index, ISTC reported a new record high of \$1.4 billion in all forms of funding over the previous five-year stretch. The economic climate has changed over the last three academic years, as the five-year total funding numbers for 2018 to 2022 fell to \$941 million. Non-tech transfer startups—those predominantly student-founded enterprises—were disproportionately impacted by this decrease in funding. In Academic Years 2019-2020 and 2020-2021, \$37.1 million was received by university-supported startups using their own technology. This two-year total was eclipsed by the single-year amount for Academic Year 2021-2022 of \$63.6 million raised by first-year non-tech transfer startups. The student entrepreneur population felt the impact of the COVID-19 pandemic, but the effect seems to be waning given the increase that has occurred over the last academic year. Due to the pandemic many entrepreneurs were limited to remote pitching and had less time to share ideas during in-person workshops. These are just a few of a multitude of factors that likely contributed to a decline in funding for student founders compared to years prior to the pandemic. Tech-transfer startups generated more funding on average compared to the 2020 Index, while the total funding received by these startups fell to \$771 million, just short of the level reached in our previous report of \$783 million.

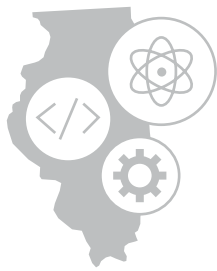


### Startup Funding by Source

2018 to 2022

Source: ISTC University Entrepreneurship Survey

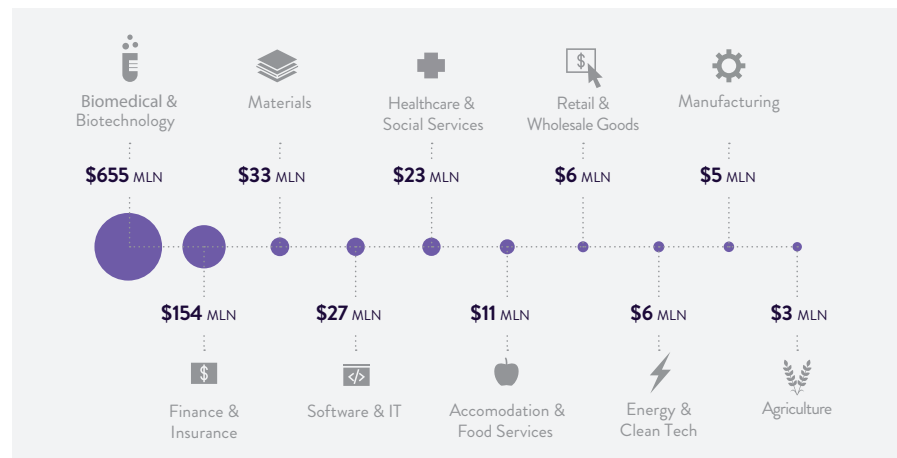




### Funding by Industry

Top 10 Industries  
2018 to 2022 (\$M)

Source: ISTC University  
Entrepreneurship Survey



## Many successful startups receive direct university funding support

One trend that has led to sustained growth in entrepreneurial activity in Illinois is the quantity and quality of university support available to students and faculty with innovative ideas. Funding support now includes everything from pitch competition prizes to equity investments and additional help to support startups at multiple stages of growth. Classes with commercialization experts, Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) workshops, and other design-thinking focused learning opportunities exist across the state for entrepreneurs seeking to learn more about the commercialization process. Conveners and STEM nonprofits like [ISTC](#), [World Business Chicago](#) (WBC), the [Illinois Innovation Network](#) (IIN), [P33](#), and others assist in this process by connecting corporate clientele with the next generation of entrepreneurs through impactful programming. One such collaborative effort is ISTC's Venture Engine matchmaking platform, a vital connector serving the interests of entrepreneurs in the most novel, dynamic sectors in the technology-based economy.

Early-stage startups benefit from startup competitions at universities across the state, including DePaul University's [Coleman Entrepreneurship Center Pitch Madness Competition](#); Illinois State University's [Means Center Startup Showcase](#); Illinois Tech's [Innovation Challenge and Kaplan Pitch Tank Competition](#); Northern Illinois University's [College of Business Big Idea Pitch Competition](#); Northwestern University's [VentureCat](#); Bradley University's [Big Idea Competition](#); Southern Illinois University's [Saluki Pitch Competition](#); The University of Chicago's [Edward L. Kaplan, '71, New Venture Challenge](#) (NVC); and University of Illinois at Urbana-Champaign's [Cozad New Venture Challenge](#). Active university funds include Illinois State University's [William and Nancy Yarger Entrepreneurial Support Fund](#); Northwestern University's [N.XT Fund](#) and [NUSeeds](#); The University



of Chicago's [George Shultz Innovation Fund](#) and [UChicago Startup Investment Program](#); University of Illinois' [Illinois Ventures](#) and the [I-Start Seed Fund](#); and University of Illinois at Chicago's [Chancellor's Innovation Fund](#). Several other sector-specific opportunities for Illinois entrepreneurs are present across the state, such as The University of Chicago's [DeepTechU](#) Venture Conference and the University of Illinois at Urbana-Champaign's [AgTech Accelerator](#).



▲ AMI CEO Gerald Wilson speaks to early stage founders as part of the Illinois Research Park's Entrepreneur-in-Residence programming



▲ AMI's new AMP-UP 100 Low Volatility primer



## SELF HEALING METAL COATINGS CONTRIBUTE TO SUSTAINABILITY GOALS

EnterpriseWorks graduate [Autonomic Materials Inc.](#) recently concluded a funding round that resulted in \$3 million worth of investments. The organization was founded in 2007, and the team is led by President and CEO Gerald Wilson, Ph.D., who was a student at UIUC where he helped develop the technology platform being commercialized by the company. Their products include "self-healing" coatings to protect metal assets. Using their products lowers the CO2 impact of protecting critical metal infrastructure. Their newest product is a coating that can be applied to metals embedded in concrete to prohibit corrosive agents from acting on the metals. While the best performing incumbent coatings expose applicators to toxic chemicals, Autonomic has placed a premium on providing products that have unprecedentedly low amounts of these chemicals. AMI's low volatility primer was recognized as a Solar Impulse Energy Efficient Solution in 2020 and a NACE Corrosion Innovation of the Year in 2019.

AMI plans to use these new funds to complete the build-out of its sales team and market its new concrete repair reinforcement coating. As part of the funding round, the company also added Mark Johnson to the board of directors. Johnson is the former CEO of Grainbridge, a grain-sales dashboard, and Zite, a news aggregator. AMI's CEO Dr. Gerald Wilson, is also an Entrepreneur-in-Residence at the University of Illinois Research Park serving as an advisor to multiple early stage founders at UIUC. He says that "Having access to all the resources available through EnterpriseWorks and the Research Park was critical when we started the company. From turnkey lab spaces to workshops aimed at teaching new entrepreneurs valuable skills to help them in

*continued on next page ►*

the early stages of running their companies, the resources that were available were very valuable. I have been pleased to see the scope of resources grow over the years and I'm confident that this investment in our entrepreneurial ecosystem will pay huge dividends for the university, our community, and the state."

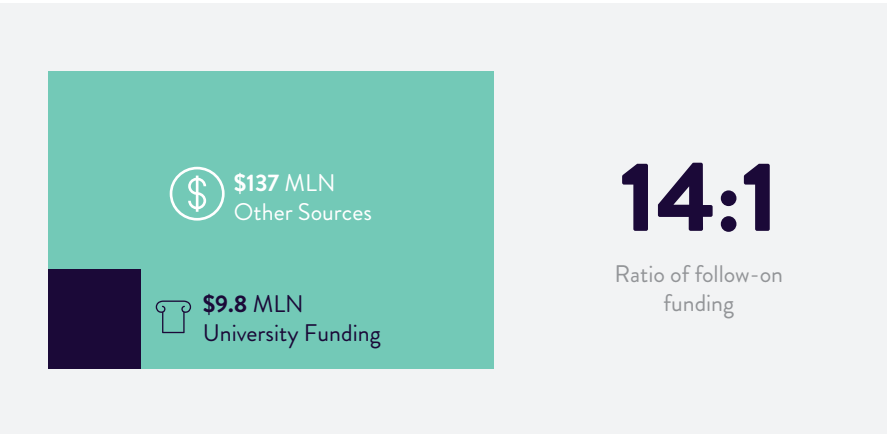
Within the last five academic years, universities gave \$9.8 million in financial support to their enterprising students and faculty members. Those that receive university assistance are slightly more likely to remain active than the general population of university-supported startups in our dataset (82.8% vs. 75.5%). Of these university-supported startups, 39.7% (302) received some form of direct university funding, either through pitch competition awards or miscellaneous financing. Direct university funding amounts are typically small (median of \$10,000) but allow early-stage startups to build minimum viable products, conceptualize their commercialization strategy, and refine their business plans while also highlighting top performers. University award recipients are much more likely than the general population of enterprises to receive follow-on funding (27.1% vs. 17.1%) sourced from an entity besides a university. The 27.1% of university award recipients that went on to get additional follow-on funding gained more than \$112 million to use for further commercialization efforts from sources outside their campus. For every \$1 that students or faculty founders make from university prizes, they could expect a return of approximately \$13.97 from outside sources, according to our data over the last five years.



**Direct University Funding**

2018 to 2022

Source: ISTC University Entrepreneurship Survey



**I-Corp participation and SBIR/STTR funding**

I-Corp is a federally-funded program administered by the National Science Foundation (NSF). It allows teams of researchers to learn about the market potential of their products, which are developed and fine-tuned at university laboratories. The Midwest I-Corp hub in Illinois is

located at UIUC which now serves as one of the region’s lead universities for the federal program. The program has developed a standardized curriculum for exploring hard tech commercialization. Learning occurs within workshops over a six-week period where teams begin to identify the market potential and customer targets for their novel product or service. The University of Illinois Urbana Champaign’s Grainger College of Engineering and EnterpriseWorks, with assistance from the Illinois Ventures team, manages the program.

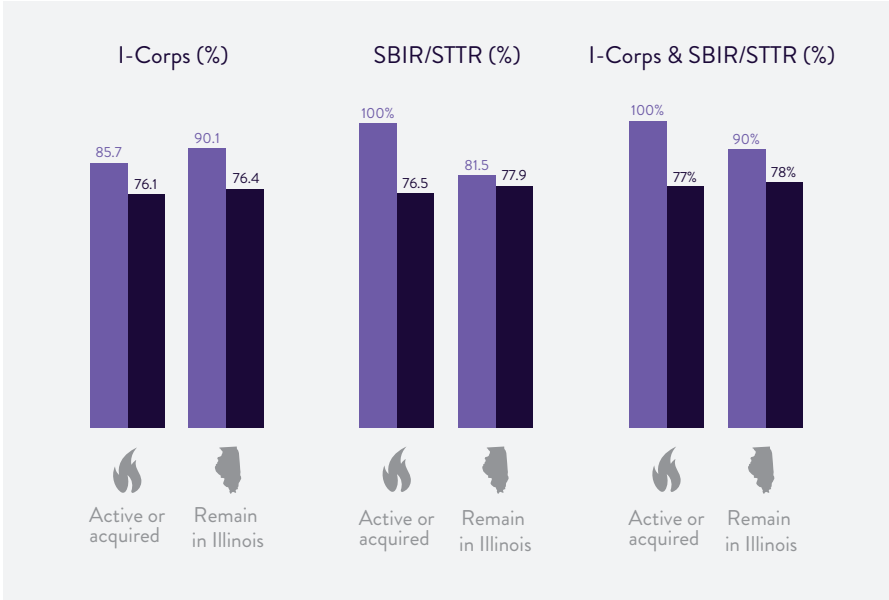


**I-Corps & SBIR/STTR**

2018 to 2022

■ Participants  
■ Non-Participants

Source: ISTC University Entrepreneurship Survey



Ninety-one startups in our survey were reported as having previously been I-Corp teams. The data shows that of the I-Corp participating small businesses formed over the last five academic years, 85.7% remain active. Eighty-two I-Corp participants (90.1%) kept their businesses in Illinois during the time period of this study. I-Corp participants are more likely than non-participants to keep their businesses active (85.7% vs. 76.1%), and base their small business out of Illinois (90.1% vs. 76.4%).

Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) are similar grant programs run by the U.S. Small Business Administration under the banner of "America’s Seed Fund." Federal agencies with extramural research budgets over \$100 million are required to allot 3.2% of their budget each year to small business grants under the SBIR program. The Department of Energy, Department of Defense, National Science Foundation, the National Institutes of Health, and many other major departments participate in the program. The STTR program requires the largest of these federal agencies to contribute .45% of all extramural research budgets to fund cooperative research and development (R&D) projects between small businesses and premier research institutions. Both programs seek to catalyze technology-based economic development by assisting early-stage startups.



Over the past five academic years, 27 university-supported startups have received funding from a federal agency through an SBIR or STTR grant. All of these startups remain active, according to our survey, and only five of them have moved out of state to pursue funding opportunities.

Illinois founders received 157 SBIR or STTR awards in 2021, amounting to an investment of \$85,598,210. This places Illinois 12th overall in the number of companies receiving awards. It also ranks 13th in federal funding allocated to ventures in the state. Illinois passed legislation in March of 2021 to provide matching funds for all Phase I SBIR/STTR awardees up to \$50,000. In the FY 2023 budget, \$5 million is allocated to this program. We expect the increase in matching funds will be an incentive to encourage more founders to file SBIR/STTR grant applications in the coming years.



▲ mySibi created an easy e-commerce experience for food ingredients buyers



## A B2B E-COMMERCE PLATFORM TO CONNECT HEALTH FOOD STORES WITH REPUTABLE SUPPLIERS

Business-to-business transactions in the food and retail space are increasingly moving to online forums and platforms, and they have been for some time. Shopify, NetSuite, and several others have been operating in the space for two decades. MySibi, founded by DePaul student Kevin Natale in 2020, aims to do what the other B2B e-commerce platforms do for suppliers and buyers but with a focus on health food ingredients. Offering specialty ingredients like Orange Habanero Chilli Puree, Beechwood Creosote, and Cassia Oil, among other items, Kevin's creation works with wholesale suppliers like Ernesto Ventos, Sustainable Botanicals, Cargill, and ISTC Partner Archer Daniels Midland (ADM) company.

MySibi's business model establishes it as a platform to connect restaurants and marketplaces with reputable ingredient suppliers from all over the world. It is their belief that the supply chain crisis that is currently hurting the food industry will be partially quelled by the move of suppliers and buyers to e-commerce platforms, a process the MySibi founder finds is rapidly accelerating.

# FOUNDERS

## <sup>1</sup> Estimate Statistic

Estimate based on subset of 485 startups for which data were available

## <sup>2</sup> Crunchbase 2020 Funding to Female Founders Report

## Women founders

Our Index collection includes questions about the demographic profile of the respondents' student and faculty founders. These questions usually have a response rate of 50%. Over the past five years ISTC estimates that 36.7% of all university-supported startups were founded by women<sup>1</sup>. Globally, around 20% of startups receiving a first round of funding feature a woman or women among their group of founders<sup>2</sup>. The efforts of numerous mission-oriented projects like [GET Cities](#) and [Chicago:Blend](#) are beginning to show returns.

University diversity and equity programs within the tech space in Illinois serve as a model for other states in how to effectively promote the widening of our ecosystem to new parties. Programs like the [Women in Entrepreneurship Institute at DePaul](#) and the [Propel Program at Northwestern](#) are helping to push the state forward. Both programs were formed in 2018 and provide one-on-one mentoring opportunities, pitch competitions, and cash prizes for women entrepreneurs.

Outside of Chicago, The Grainger College of Engineering and the EnterpriseWorks Incubator at the University of Illinois collaborate to provide the [Advancing Women and Underrepresented Entrepreneurs \(AWARE\) program](#). AWARE is intended to reveal a pathway to the other programming offered at the university, such as SBIR workshops, the NSF's I-Corp program, and the Cozad New Venture Challenge, for students who have been inadequately represented among startup founders. The NSF's involvement in this process has been clear since the program's inception in 2016.

The numbers in this Index support the conclusion that these equity-focused initiatives are making a real impact. In our 2018 Index, it was reported that 28% of university-supported small businesses featured a woman as a co-founder or founder, this rose to 33% in 2020, and to nearly 37% this year. Responses to the demographic portion of the survey show that there are 178 startups founded by a woman and 51.7% received funding. This is consistent with the 2020 University Entrepreneurship Index when 52.9% of startups featuring a woman as a founder or co-founder garnered funding.



▲ Jasmine Shells, Founder and CEO of Five to Nine



## CONSOLIDATING AND SIMPLIFYING TRAINING AND ONBOARDING PROGRAMS

This year, Five to Nine, a human resources and employee resource group platform co-founded by then-Chicago Booth School student Jasmine Shells, [raised \\$4.25 million as part of their first seed round](#). Shells and her co-founder are among a very small group of Black founders to raise more than \$1 million in a single seed funding round. Five to Nine rapidly scaled their business model after their fourth place finish at the Polsky Center's 2021 Edward L. Kaplan New Venture Challenge at the University of Chicago. Chicago-based venture capital fund [Cleveland Avenue](#) was among the group of funders for Five to Nine's most recent round.

The goal of Five to Nine is to consolidate and simplify the in-person employee programming that a company can offer. Training, onboarding, and general HR events can be promoted and managed on the platform while also collecting valuable insights on the benefit of said programming. One area that the organization hopes to promote is the creation of employee resource groups (ERGs) at larger corporations. ERGs coalesce like-minded individuals and employees of the same affinity groups with the aim of fostering a more diverse, equitable, and synergistic workplace. Often the organizers of these initiatives within businesses face logistical hurdles and unconscious pressures. Many "diversity hires" feel pressure to participate in these initiatives without knowing how they may benefit from the programs. Five to Nine seeks to fill in the gaps by easing the lift for organizers on the front end and making the value add for employees obvious on the back end.

**3 Estimate Statistic**

Estimate based on a subset of 269 startups for which data were available

**Diverse founders more likely to remain active**

According to our survey of university-supported startups, startups with an immigrant founder or co-founders and those with at least one woman founder are more likely to remain active (80.7% and 80.9%, respectively) than the general population (76.2%). Immigrants and foreign-born founders are critical to Illinois' small business ecosystem. Innovation is benefitted by the presence of new ideas from abroad, and immigration drives the transfer of knowledge between countries. Our survey suggests that the percentage of university-supported startups founded by at least one immigrant entrepreneur is around 42%<sup>3</sup>. This is the highest percentage of immigrant entrepreneurial activity that ISTC has recorded over the last decade of collecting this data. Of those 115 startups with immigrant founders that remain active, 39.1% have received additional funding from other sources.

Immigrants often face barriers, like the cost of travel, limited social networks, and language gaps that make forming a new business harder. More must be done to ensure that immigrants who desire to be an entrepreneur in the U.S. are given time to scale their businesses. Illinois already benefits from having an extremely diverse small business owner population and stands to gain from federal policy changes that incentivize, rather than discourage, immigration. Policies like an immigrant entrepreneur's visa program and paths to citizenship for foreign-born students are two areas where federal legislation can boost innovation in Illinois and in other states.

**Foreign-born Entrepreneurs and Women Founders**

2018 to 2022

University-supported startup founders

Source: ISTC University Entrepreneurship Survey



**37%**

36.7% of university-supported startups feature a **woman as founder or co-founder**



**43%**

42.8% of university-supported startups feature a foreign born founder or co-founder



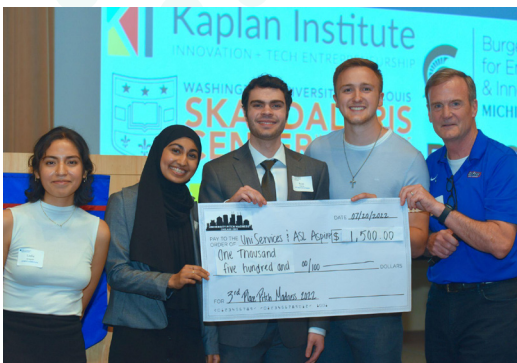
▲ Kwiki Karts Winning Top Prize at Kaplan Institute's PitchTank Competition



## IMPROVING COMMUNICATIONS IN MOBILE FOOD DELIVERY SERVICES

The 2022 Kaplan Institute's Pitch Tank Competition grand prize winner Kwiki Karts is a startup already present on the world stage. Co-founder Oluwafemi "Femi" Lafua is Nigerian and noticed a need for mobile food delivery services in the country. Kwiki utilizes WhatsApp to communicate with customers and provide a service similar to UberEats and Postmates. Their riders travel via motorbikes, and the company plans to use additional funding to offer its services in more locations over the coming months. As they expand operations into new cities in Nigeria, their goal is to increase the functionality of their WhatsApp chatbot to include tracking services similar to other food delivery services.

As the grand prize winner, Femi and his team were given a \$30,000 cash prize by the Ed Kaplan Family Institute for Innovation and Tech Entrepreneurship. The Institute's support services were part of the reason that Femi first considered coming to the United States. He was very interested in scaling the operations of Kwiki Karts and moving away from the WhatsApp communication model, preferring a more sustainable option. During the [2022 Pitch Tank Competition](#) in April, Femi noted how helpful the Illinois Institute of Technology's programming has been in his search for entrepreneurial expertise.



▲ ASL Inspire Receiving 3rd Place Award at DePaul's Pitch Madness Competition



## SUPPORTING DEAF AND HARD-OF-HEARING STUDENTS IN STEM

Virtual learning is increasingly important in an era when young learners are seeking as much flexibility as possible in pursuit of their dreams. Many young learners with hearing loss have run into challenges pursuing their STEM education, including unconscious

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▲ ASL Aspire Founder Mona Jawad

biases that exist within the classroom. [ASL Aspire](#) seeks to bridge this gap and support deaf and hard-of-hearing individuals in their learning, especially in regard to STEM vocabulary. Because incidental learning—knowledge imparted through real-world interaction with general course subjects—can be more difficult for those who do not have full access to multisensory perception, the ASL Aspire App is intended to provide such learning through games and challenges, all of which are in American Sign Language. The goal is to assist middle school students and increase their confidence in STEM subjects.

Co-Founders Ayesha Kazi and Mona Jawad and a team of 10 other students at the University of Illinois at Urbana-Champaign contributed to the app's design. Their trials and tribulations paid off in 2021 when the team was named the winner of the Carle Illinois College of Medicine [Health Make-a-thon](#). This year, ASL Aspire was selected through a Shark Tank judging process at the 2022 Health Make-a-Thon, which included the development of a business plan for the Health Maker Lab Cohort 2022. The team was awarded \$20,000 in innovation funds and provided technical and business mentoring for their prototyping and entrepreneurial activities as a member of the HML cohort. Lawrence Angrave, a distinguished professor of Computer Science at UIUC, said of the team that "It was obvious from the very first meeting that this core team had mountains of enthusiasm, a vision, perseverance, and the ability to work effectively to create something worthwhile." The team was given a \$5,000 cash prize as a result of their win at the Health Make-a-thon and has [expressed a desire](#) to continue developing the app to address a need within the STEM education community. ASL Aspire was recently announced as a member of the third cohort for the [Illinois IDEA Institute's Grassroots Initiatives to Address Needs Together \(GIANT\) program](#). The 2022 program includes advising for each team from a designated mentor and funding phases; four Phase I projects and three Phase II projects will receive funding.

# TECH TRANSFER METRICS

## Licensing revenue and patent acquisition increases significantly

University IP is a complex and important area of economic development. Universities play a key role in bringing new products and services to market. Researchers on Illinois campuses serve as the first movers; they are responsible for engaging with a university to process a disclosure. Disclosures reveal where funding for a project came from, and the next step in the process is a review by university officials. If university officials find that a product or service could eventually be commercially viable, while also being worth the expense of pursuing a patent, the patent application process begins.

The next major step after disclosure is protection of the intellectual property. The U.S. Patent and Trademark Office usually takes between four and six years to confirm a patent. Universities guide the patent application process in an effort to get their new IP across the finish line, which can often be an arduous journey. Universities are deeply engrossed in this work because of the multitude of benefits they can garner from the commercialization of a researcher's work, which constitutes the final stage of the technology transfer process.

Technology and innovation created through advanced research are transferred to the public domain through licensing, assuming that a university review process finds the product has a high chance of being utilized by an existing company or a new small business. Licensing agreements can consist of exclusive agreements where an entity may be permitted to use new technology in a commercial venture; these usually involve universities taking an equity stake in the new startup and a royalty arrangement. These license and option agreements also allow the university to take a stance on future acquisitions of the entity in order to protect the IP in question.

In 2020, Illinois universities disclosed 808 new inventions. In the same year, state universities were awarded more patents than any previous year, with 348 new patents awarded to researchers on campuses. There were also 246 new license and option agreements reached and initiated—an increase of 80 compared to 2018—which is a new record high in the state's history.

Commercialization and patent acquisition rapidly accelerated in 2019 and 2020, as indicated by the cumulative annual growth (CAG) rate that Illinois has achieved over the last five years. Patent awards to universities increased 7.62% annually between 2016 and 2020, while license and option agreements increased by 6.33% annually. The increase in the number of licensing agreements reached by state universities in that time frame was particularly pronounced. Illinois went from ranking 19<sup>th</sup> in 2018 to 12<sup>th</sup> in 2020.



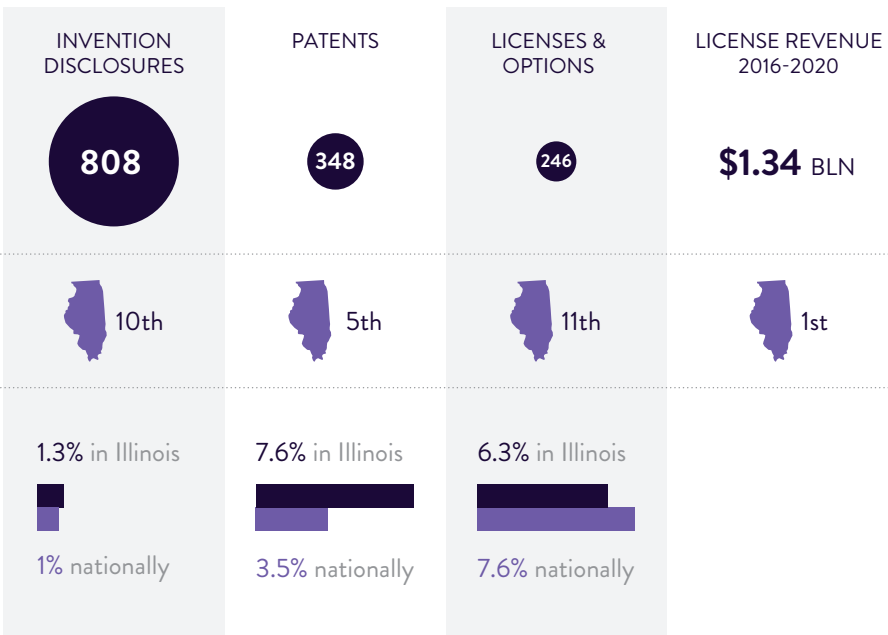
**Tech  
Transfer  
Metrics**

2020

State rank

CAG 2016-2020

Source: Association of  
University Technology  
Managers (AUTM)



**Illinois has been the nation's leader in licensing revenue over the last five years**

License agreements include opportunities for universities to receive royalties assuming the venture starts securing sales. Between 2016 and 2020, Illinois universities received \$1.34 billion in licensing revenue, the highest in the nation over this period. This total licensing revenue is carried by a number of "jackpot licenses," typically in the biomedical and therapeutics sector, that are spun out of high-research R-1 universities.

Illinois is the leader in licensing revenue despite the fact that the state has never ranked in the top 10 for the total number of license and option agreements initiated in a given year. This suggests that not only is the technology being spun out of Illinois university labs more viable than any other state but also that the state is home to several "jackpot licenses." During the pandemic, when lower residence hall occupancy and tuition deferment impacted university revenues, licensing revenues also fell, from \$310.68 million in 2019 to \$160.91 million in 2020.





▲ Andes STR Co-Founders Sebastian Rivas and Matias Duhart



## HELPING PROPERTY MANAGERS ACCESS NEW RENTAL MARKETS

2021 was a big year for [Andes STR](#), who won the Polsky Center for Entrepreneurship's Top Prize at their New Venture Challenge. Andes is a property technology startup with a goal of removing barriers and hassles that prevent people from buying or managing short-term rental properties like those made available through platforms like Airbnb. The company was founded in 2018 by pioneering CEO Sebastian Rivas, who has since taken his business global. Andes is now based out of Austin, Texas, and has operations in Canada, Chile, and the United States.

Andes' business strategy is to help rental property managers find and access new rental markets. They get an overview of what a buyer may be interested in or where their investments already exist and make suggestions on how to diversify their portfolios.

Their organization prides itself on being the go-to for data-informed decision-making about return on investment. [The Edward L. Kaplan New Venture Challenge](#) is the longest-running startup pitch challenge in Illinois and has helped support over 300 new small businesses over the competition's 26 years of existence.



▲ Dr. Mark Rasenick, Founder of Pax Neuroscience and Chief Scientific Officer



## A BLOOD TEST TO IDENTIFY TREATMENT RESISTENT DEPRESSION

Approximately one-third of patients who suffer from depression have a form of the disorder that is seemingly treatment resistant. Treatment resistant depression (TRD) impacts around seven million Americans each year. Distinguished Professor of Physiology and Biophysics Mark Rasenick, Ph.D., at the

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University of Illinois-Chicago Medical School has devoted his career to researching how depression impacts the body's physiology. There is increasing evidence from his research that shows that a molecule known as adenylyl cyclase can be an effective signal for depression-like symptoms. The body makes these molecules in response to neurotransmitters like epinephrine. Anti-depressants cause a sharp increase in neurotransmitter endorphins, but researchers have been curious as to why some patients with depression seem to have treatment-resistant symptoms. Dr. Rasenick and his team hypothesize that this treatment-resistant phenomenon is due to a problem with an [intermediary protein called Gs alpha](#). This Gs alpha protein is being studied as a potential biomarker for TRD patients; this type of research is focused on developing a blood test to diagnose depression. During a [recent controlled trial](#), 19 patients with major depressive disorder were given anti-depressants. Results showed that those patients that responded to treatment had significantly higher levels of adenylyl cyclase responses, suggesting that the intermediary protein problem theory may be correct.

The potential for the creation of a blood test to determine if someone is showing signs of depression is what led Dr. Rasenick to set up [Pax Neuroscience](#) in 2010 as an extension of the work in his lab. The results of the most recent trial in early 2022 are a cause for optimism. Rasenick said in an article by Diagnostics World that "this is the first-ever test that might indicate therapeutic response with a single biomarker. The ideal expectation is that the test could be used to determine if anti-depressant therapies are working as soon as one week after beginning treatment." This is the culmination of years of research by Dr. Rasenick and others. It is believed that a blood test like this would lead not only to better patient care but also reduce the social stigma that those with depression face. Pax Neuroscience is calling its blood test the "MoodMarkDx" and is preparing to partner with a novel anti-depressant treatment to evaluate and compare treatment responders vs. non-responders.

## Looking forward

Incubators serve a vital role for student founders leaving the university where they began their business journey. Often, businesses choose to leave Illinois not because they can't find a market for their products but because they are looking for funding opportunities. Over the past decade, Illinois' university entrepreneurship centers have set out to reverse this trend



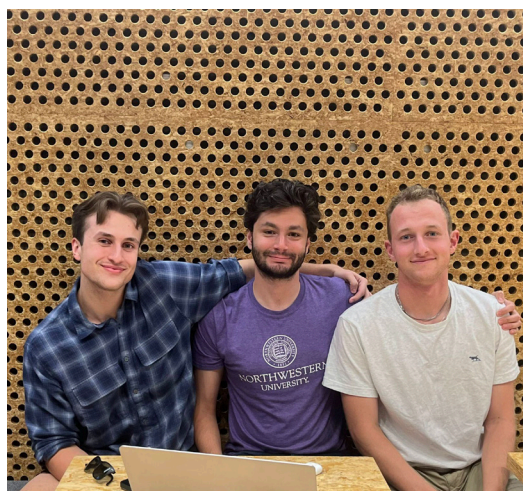
of high-achieving startups seeking funding in other states by improving the pipeline to resources outside campus. These resources include [1871](#), [BLUE1647](#), [iBIO](#), the [Industrial Council of Nearwest Chicago](#) (ICNC), [ISTC](#), [mHUB](#), [MxD](#), [TechNexus](#), [Techstars](#), and many more. Industry-specific resources include [2112](#), [CBC Accelerator Network](#) (CBCAN), [Healthbox](#), [Evergreen Climate Innovations](#), [Current](#), [Duality](#), [P33](#), mHub's [Climate and Energy Tech Accelerator](#), [MATTER](#), [The Hatchery](#), among others.

Given the demographics of student entrepreneurs in Illinois, the state stands to benefit from the creation of a startup visa program at the federal level. Startups founded at Illinois universities by individuals born outside of the United States have created close to 300 jobs over the last five years. While this may be seen as a success, barriers continue to block the full potential of immigrant founders. These barriers include, but are not limited to language accessibility, limited social networking during the pandemic, and travel-related costs associated with reaching a target market.

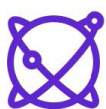
A startup visa program at the federal level could provide access and encourage immigrant founders to pursue small business ventures by granting citizenship to successful entrepreneurs who reach specified benchmarks. It is estimated that improving current STEM visa programs and/or creating new startup visas could expand the national economy by up to \$233 billion over the next decade; about \$9.65B of this growth would be concentrated in Illinois alone. With this in mind, ISTC will continue to work alongside the American Business Immigration Coalition (ABIC) and others to advocate for the creation of this program.

ISTC has consistently recognized the benefits offered to Illinois entrepreneurs by the U.S. Small Business Administration's "America's Seed Fund." SBIR and STTR grants have been a vital part of the success story of many university-supported startups over the last two decades in Illinois. (FWD.us Report). In October 2022, the Federal SBIR program was reauthorized, which will extend the program and its benefits until 2025. The protection of this program will remain a key focus area for ISTC.

ISTC is proud to be a continued supporter of America's Seed Fund and will continue to advocate for the SBIR matching funds program passed by the legislature last year. Governor Pritzker's administration and the Department of Commerce and Economic Opportunity announced that \$5M will be allocated to the matching funds program for 2023. Early-stage startup founders will now be able to utilize a new funding source in their pursuit of an innovative product or service.



▲ JupiterDX Co-Founders Mason Secky-Koebel and Alex Bahram with team member Gleb Blekher



# JupiterDX

Building the Highways of Healthcare



## Northwestern

### COMMUNICATING THE REWARDS OF SHARING HEALTH CARE DATA

Northwestern's undergraduate programming for entrepreneurship includes its [Jumpstart](#) initiative. [JupiterDX](#) is one student team that has benefited from this programming over the last academic year. Their startup is among the most promising in ISTC's dataset, and they developed the idea for their health care data portal through the Jumpstart programming. The goal of the company is to provide patients with a one-stop resource for managing their health care data and simplify the rewards process. Data-sharing is an important part of making informed health care decisions. JupiterDX's core thesis is that the best way to share valuable clinical data with leading researchers is by putting the patient in total control of the process. JupiterDX asks each patient if they are interested in providing de-identified healthcare information to research causes they care about and will compensate them for any information that is purchased through the platform. The platform also allows patients to easily share data about their condition with loved ones and researchers attempting to learn more about emerging chronic illnesses, such as long COVID-19. JupiterDX Co-Founder Alex Bahram mentioned at ["The Garage Jumpstart Demo Days" event in August](#) that nearly 91% of patients would be interested in sharing their health care information with a cause where they have a personal connection.

Sharing health care data reduces the chance of redundancy. Additionally, with access to this data, researchers can ensure that care is reliable and provide an independent check on potential problems emerging from the industry. Alex Bahram, Co-Founder Mason Secky-Kobel, and Marketing Specialist Gleb Blekher noticed that the information vital to this research process was not going to where it was needed most. Valuable health care data cannot be utilized if people are worried about potential threats to their privacy. Alex Bahram is particularly concerned about patients dealing with chronic pain or illnesses that often journey between multiple providers in their search for solutions. Alex noted in a [spotlight by the Garage](#) that "With JupiterDx, we are hoping to make that journey easier by creating one central location for all health care data, from doctor visits to smartwatch data." JupiterDX is primed to disrupt health care data management with automated processes and a focus on patient privacy. They feel it is vital to promote a product that is going to keep users' information secure while also incentivizing the sharing of medical data, which is a valuable resource for research.



The Illinois Science & Technology Coalition (ISTC) is a member-driven nonprofit that measures, connects, and advocate for Illinois' innovation economy. Created by the State of Illinois 30 years ago, we create powerful links between the state's universities, industry, startups, and government to strengthen our economy and talent pipeline through data collection, policy advocacy, and programs.

## INDEX STAFF & CONTRIBUTORS

**COLLEEN D. EGAN**  
President & CEO

**AUSTIN GREEN**  
Data & Policy Intern

**ANNE MARIE RZEPECKI**  
Director of Marketing & Communications

**ALL TOGETHER**  
Layout & Design

**ROB PATINO**  
Board Member Advisor

**JIM BRAY**  
Board Member Advisor

**KHESIA TAYLOR**  
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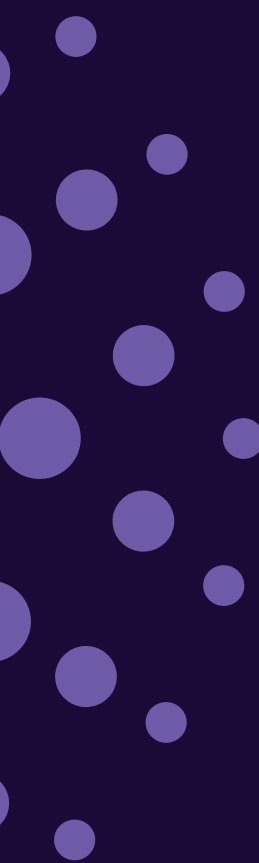


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# Innovation Index