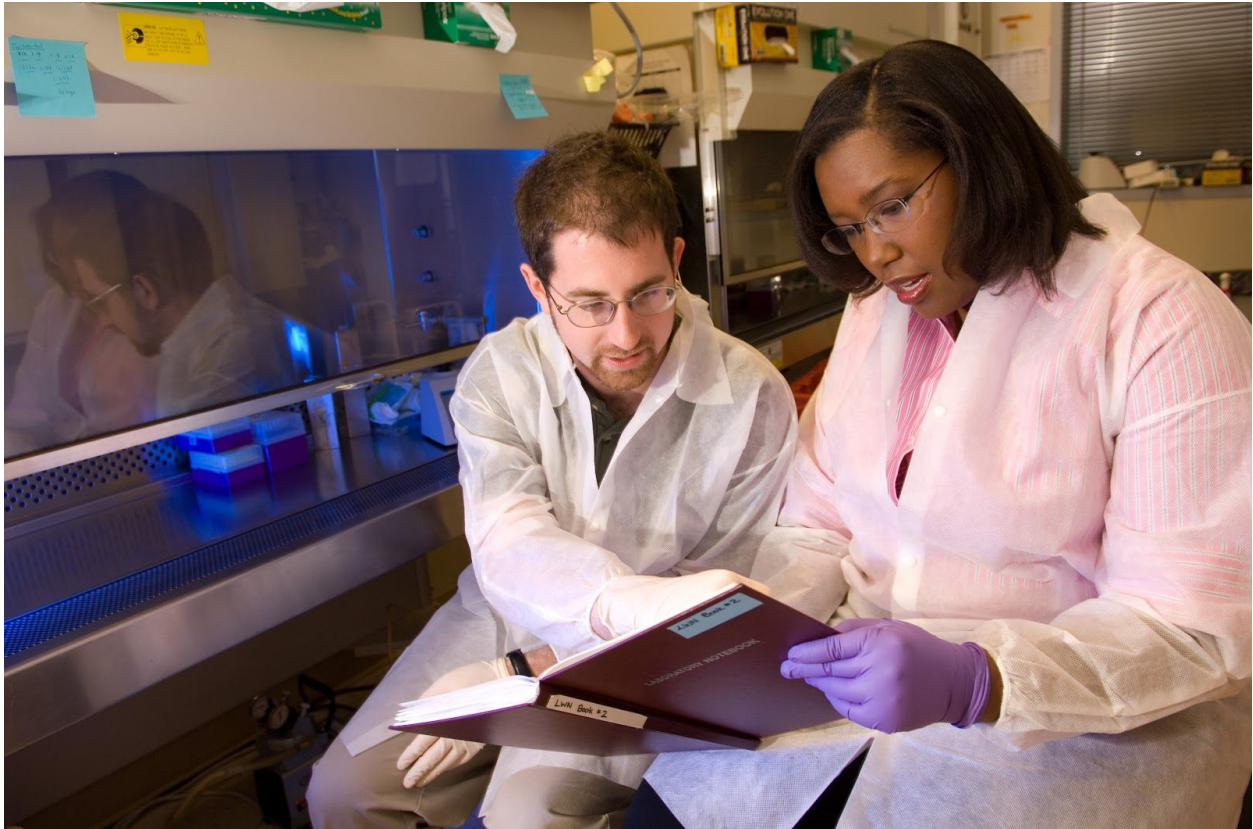


# Creating a Research Startup at Georgia Tech

## For faculty, researchers and PhD students

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## Introduction

Georgia Tech is a world class research institute, annually ranked as one of the top five engineering schools in the United States. Georgia Tech is also an inventive place, creating new innovations and startup companies at a brisk pace. Georgia Tech was originally founded to create economic activity in the Georgia and the Southeast, and this continues today in the form of startup companies created from research.

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“One of our goals is for Georgia Tech to be the **Innovation Institute**, a place where technology, economics, business, public policy, law, commercialization and entrepreneurship co-mingle and thrive. This involves creating **a culture that values not only the rewards of research, but also the economic and commercial impact of the results.**

” -- Bud Peterson

This guide is for everyone involved with research at Georgia Tech interested in creating a spinout to commercialize their technology. It is intended to help you understand how startups are created at Georgia Tech, and to provide you with information about all of the resources available to you as faculty or a student of the Institute.

## VentureLab

This guide was created by VentureLab. VentureLab was founded in 2001 to focus on building startup companies from research at Georgia Tech. VentureLab is part of the Enterprise Innovation Institute (EI2) at Georgia Tech. EI2 includes a number of organizations at Georgia Tech, all focused on economic development and service. In addition to VentureLab, EI2 includes the ATDC, a premier University-based technology startup incubator.

VentureLab is staffed by engineers and entrepreneurs who help launch startups from Georgia Tech research. VentureLab is the place to go to get the experience, funding and best practices for building your startup. It is open to all faculty and graduate students at Georgia Tech. VentureLab does not charge a fee and does not take equity in your startup.

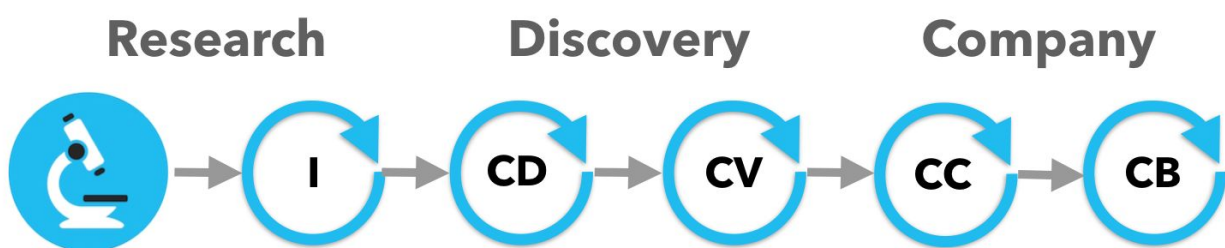
VentureLab is one of seven nodes for the National Science Foundation Innovation Corps (I-Corps) program. This program was created in 2011 with the goal of increasing the impact of NSF funded research by creating better startups. VentureLab follows the I-Corps philosophy, using the Customer Development model and the Business Model Canvas as tools for creating startups.

## Customer Development Model

Steve Blank, entrepreneur, author and cofounder of the NSF I-Corps defines a startup as a **temporary organization searching for a repeatable and scalable business model**. Until customer needs are known and a compelling business model can be found, there is no business. The creation of a spinout company is a process by which startups reduce risk. Steve Blank also defines four

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stages that all new companies go through, from Research to Company launch and growth. We at VentureLab have added a fifth stage at the front end of the process called Ideation.



**I:** Ideation      **CD:** Customer Discovery      **CV:** Customer Validation  
**CC:** Customer Creation      **CB:** Company Building

## Ideation

Innovations often come from success in the research process. Technology innovations are often created without any intended use case. The Ideation stage is where we evaluate the potential use-cases for a technology innovation. Where can it be used? To whom do we believe great value can be delivered? We will evaluate multiple potential use cases with the goal of finding one strong business thesis. A business thesis is a statement defining what your product is, who your customer is, and why they will buy.

## Customer Discovery

Customer Discovery is the process of getting out of the building, talking to customers and users and learning about customers' problems and needs. We start with our general business thesis. We then make reasonable hypotheses about what must be true such that the thesis is true. These hypotheses are tested by a series of interviews with potential customers. As evidence is gathered, we continuously update our hypotheses, business thesis and our working business model canvas.

After 100 interviews we have either a great understanding of our customer and a compelling business model, or we go back to the lab and start over. A key element of the CD process is that we never talk about the innovation or technology on the front end of the interview, that is, we don't engage in selling or trying to persuade the interviewer of the value of the innovation or technology. This tends to bias the discussion. Rather, we use a style of open, adaptive inquiry to discover where the true pains are in the market, and observe if our hypotheses match up with actual customer experience. Naturally, on the back-end of an interview, it is natural to say: "What we have is

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early...not a product yet, but here's what we're working on." Useful feedback will found, but without biasing earlier opinions and insights.

We also create a minimum viable product (MVP) test and validate that our projected product will deliver the value we expect to our customers. We don't build our product yet, we use a product test instead. Only after completing CD do we even know what to build. Obviously, this is much easier to achieve with software products, but rest assured, the model *does* apply to hardware as well.

## **Customer Validation**

Customer Validation (CV) is when we build our first functional prototypes and test our sales process. In CD, we learned about our customers' needs. In CV, we prove they will be willing to buy our product. We do this by testing our Value Proposition in front of potential early-adopter or 'earlyvangelist' customers. If we cannot prove a sales process, we must pivot our business model and go back to the Ideation stage.

## **Customer Creation**

Once you have a deep understanding of your customers and a proven sales process, you can form a company and raise outside capital. During the Customer Creation (CC) phase, you will attempt to get an early-adopter to actually pay for your product or service. Once this has been done, not once but several times, will you have a shot at raising money. If you can on-board several customers (3-5), you will have proven your business model is *repeatable*. You have yet to prove your business is *scaleable*!

Customer Creation is usually the stage where you legally form a company and raise seed capital. The founders often start working on the business full time.

## **Company Building**

Company Building (CB) is the process of scaling up your business. This is the stage where you might move into an incubator as well as raise your first round of venture capital. You will use this stage to build out a complete management team and start focusing on execution of a now proven business model.

## **Startup Risk Factors**

All startups, especially those coming from research, begin with a large set of unknowns. These unknowns create risk. We have identified five major forms of risk any technology startup will face.

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## **Market Risk**

Can we define a customer segment that will buy our product? Does our technology enable a product that solves a big enough problem? What is the competitive environment? Do we understand the ecosystem around our customers and the use of our product? Do we understand the channel by which we will sell? What is the value chain? A deep understanding of the market risks is essential to understanding the chances of building a viable business. In addition to knowing WHERE the startup fit into the supply chain (and therefore who really IS the customer?), it is important to understand legal and regulatory hurdles that might slow or prevent adoption or limit competitive ability).

## **Technology Risk**

Can we engineer a product around our technology? Will it work in real-world conditions? Can we manufacture it reliably and repeatedly?

## **People Risk**

Can we find the right people to be a part of our startup? What holes do we need to fill? Can the team make the transition from discovery to execution? Investors value the TEAM above the Market and above the Technology. They would rather invest in an 'A-team' and a 'B-idea' vs. a 'B-team' and an 'A-idea.' Investors will usually require an experienced CEO be at the helm, and will want to know that the equity compensation plan (capitalization table or 'cap table') favors the people actually taking the risk in the business, that is, the CEO and other key full-time employees. This is often a difficult concept for the Faculty Innovator, especially, if it is their idea. However, investor value execution (once the business has transitioned from 'search mode' to execution mode) above invention. Untold numbers of startups fail, not because the idea was bad or the technology doesn't work, but because a scalable and repeatable business cannot be found. The model cannot be made repeatable unless there is a well-oiled execution machine put in place and managed by key employees, such as the CEO, CTO and VP of Marketing, Sales, & Business Development.

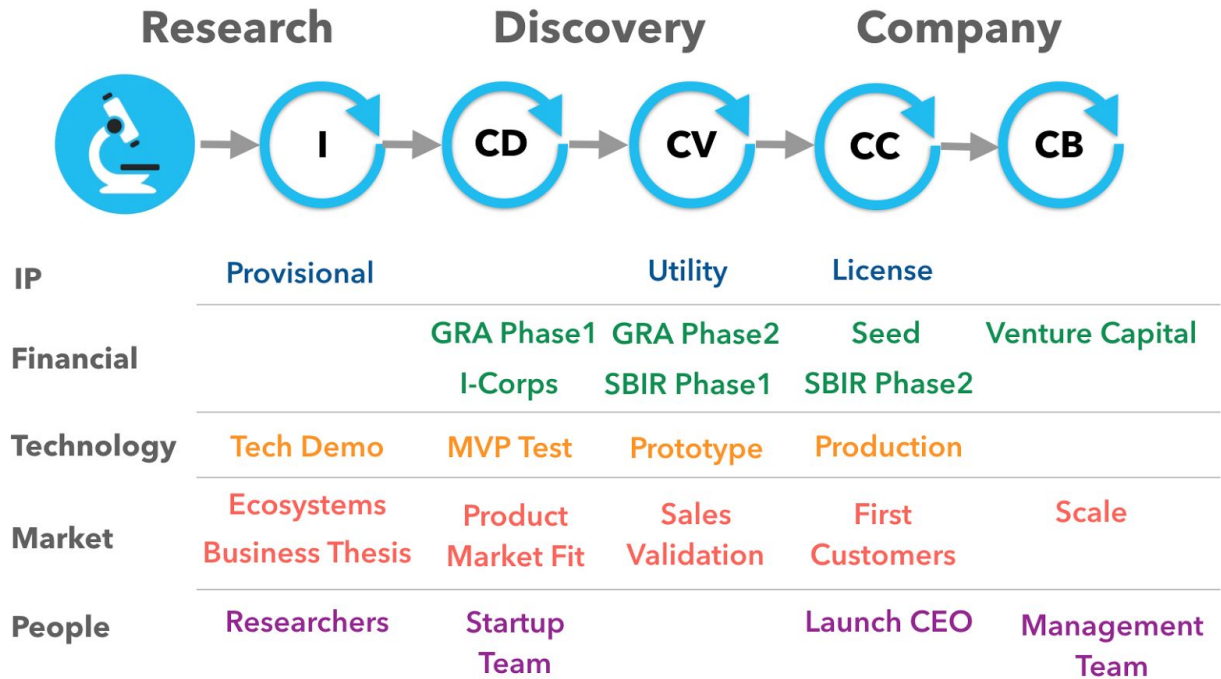
## **Financial Risk**

How much money will it take to develop our product? What is the cost of manufacturing our product? Can we find a profitable revenue model?

## **IP Risk**

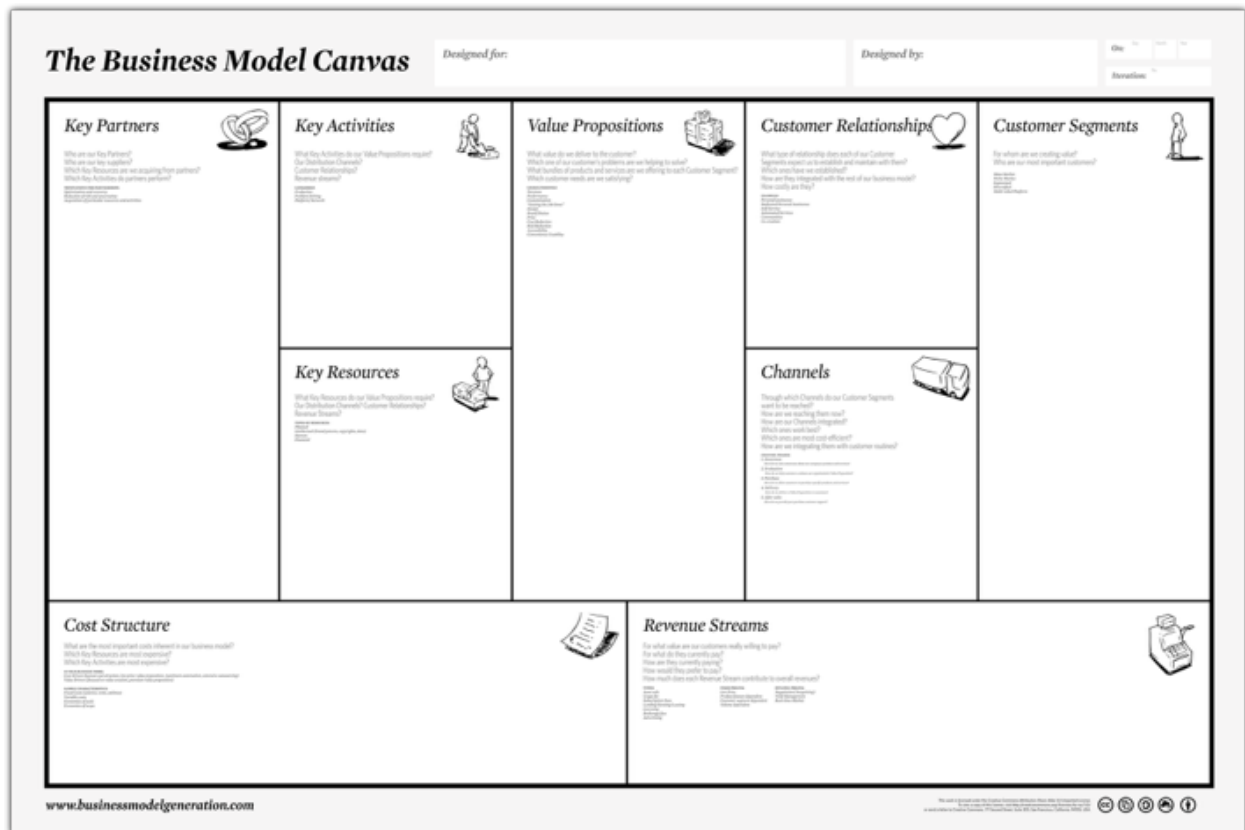
Is there intellectual property for our innovation? Is it patentable? Do we have freedom-to-operate? Can we execute a license to the technology we need to sell our product?

## VentureLab Process



## Business Model Canvas

At Georgia Tech, we do not write business plans for startups. A business plan is a tool for when customers and their needs are well understood. This is not true for a startup. Instead we use the business model canvas, popularized by Alex Osterwalder in his book *Business Model Generation*.



During the startup process, we will create and constantly revise a business model canvas (BMC) for each startup project that we work with. Updates occur as we conduct CD and CV, and collect evidence to back up our guesses about the business model.

## Funding

There are a variety of different options for funding a startup at Georgia Tech. These include non-dilutive grant funding, early-stage Seed funding and Venture Capital.

### Grant Funding

Georgia Tech researchers have access to a number of valuable grant programs. We always recommend pursuing grant funding because it does not necessarily require the company to be formed or the entire team to be assembled. Grant funding is non-dilutive. This means you do not have to give up equity in your startup to receive the funding.

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## NSF Innovation Corps

[www.nsf.gov/news/special\\_reports/i-corps/](http://www.nsf.gov/news/special_reports/i-corps/)

### **lcorpssouth.com**

The National Science Foundation Innovation Corps (I-Corps) program was founded in 2011 with the twin goals of increasing the quality of startups emerging from NSF-funded basic research, and to teach NSF researchers about entrepreneurship and how to recognize opportunities for commercializing their research. Georgia Tech is the home for I-Corps South, one of seven regional nodes for the I-Corps program.

The national I-Corps program includes a \$50,000 grant and a six-week customer discovery boot-camp. A lineage to NSF research is required to qualify for the national I-Corps program. You apply to national I-Corps as a team. Teams consist of a PI, usually a professor, an entrepreneurial lead, usually a PhD student, and an industry mentor. VentureLab can help find a mentor for your team. A one page application is required followed by two or three short conference calls with the program managers. A decision is made within a few weeks. Over forty teams from Georgia Tech have completed the I-Corps national program.

I-Corps South, the Georgia Tech led regional node for I-Corps, also hosts four regional I-Corps programs per year. These are 6-week customer discovery programs and teams that complete the regional program qualify for the national I-Corps program. I-Corps regional teams are two or more members, and can be student teams. A PI and mentor are not required, nor is NSF lineage.

## Georgia Research Alliance

### **gra.org**

The Georgia Research Alliance (GRA) is a nonprofit organization that works with the University System of Georgia and the Georgia Department of Economic Development. The GRA recruits world-class researchers to Georgia Universities through their Eminent Scholar program. The GRA also helps build out technology for University labs.

The GRA has a commercialization grant program dedicated to spinouts from Universities in the State of Georgia. Projects that include intellectual property such as patents are eligible for the program. There is a \$50k Phase 1 grant and a \$100k Phase 2 grant. These are grants to Georgia Tech for the purpose of working towards commercialization of the technology. There is also a Phase 3 loan of up to \$250,000 that is made directly to the spinout company once it has launched. Projects receiving



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GRA grant funding are also eligible for the GRA Venture Fund (GRAVF). The GRAVF will selectively make equity investments in GRA-funded companies pending extensive due-diligence.

## **NSF AIR-TT**

**[www.nsf.gov/eng/iip/pfi/air-tt.jsp](http://www.nsf.gov/eng/iip/pfi/air-tt.jsp)**

Partnerships for Innovation: Accelerating Innovation Research- Technology Transfer (PFI:AIR-TT) is a grant program of the National Science Foundation to help to commercialize basic research funded by the NSF. AIR grants are made directly to the University for \$200K and last 18 months. The grants can be used to perform more targeted CD, and to create a prototype and to scale up the technology.

AIR-TT grant proposals are due once a year in September. Funds are generally available the following May. Researchers must have an NSF lineage, either a research award that ended within six years of the proposal deadline or a have graduated from I-Corps within the previous three years. AIR-TT proposals include a details market opportunity section and a commercialization plan. The team must include someone with business experience. VentureLab can assist in writing the grant and providing business experience for the team.

## **SBIR/STTR**

**[www.sbir.gov](http://www.sbir.gov)**

The SBIR (and STTR) are programs of the US Government to provide R&D funding for small businesses. These programs do not fund basic research, but rather fund application research with hopes of developing a commercially viable product for the small business. The SBIR program refers to itself as America's Seed Fund. SBIR funding is often used by University research spinouts. SBIR grants are made directly to the spinout company and not to Georgia Tech. Phase 1 grants are up to \$150K and Phase 2 grants are up to \$1M.

Each government agency issues their own solicitation and each have their own rules and deadlines for proposal submission. Eleven agencies participate. Generally, NIH proposals are due in January, April and September and NSF proposals are due in June and December. Below is the current calendar showing when solicitations are released and when proposals are due. Note this can change, make sure to check with the specific agency.

**USDA:** Released June, Close October

**NSF:** Released March, Close June  
Released October, Close December

**NIST:** Released January, Close March

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- NOAA:** Released October, Close January
  - DOD:** Released April, Close June  
Released July, Close September  
Released December, Close march
  - DOEd:** Released December, Close January
  - DOE:** Released July, Close October  
Released October, Close February
  - EPA:** Released August, Close October
  - DHS:** Released December, Close January
  - NASA:** Released 11/14, Close 1/20
  - NIH:** Grants Released June, Close September, January, April  
Contracts Released June, Close September
  - DOT:** Released October, Close December

Georgia Tech offers support to companies considering an SBIR grant proposal. We have a dedicated SBIR support expert who is available to meet and consult with companies interested in learning more and creating an SBIR strategy. The only requirement is to first join ATDC - which is free for any Georgia Tech student, researcher or faculty. There is an SBIR information session on the first Tuesday of each month at 11:30am at ATDC.

## **VentureWell E-Team**

### **venturewell.org**

VentureWell is a nonprofit based in Amherst, MA. VentureWell is supported by the Lemelson Foundation and provides training and funding for student entrepreneurs. The VentureWell e-team grant program provides up to \$25,000 to student teams. VentureWell hosts various training programs including ASPIRE. VentureWell is also a partner in the NSF I-Corps program

## **Seed Funding**

Once a spinout company has formed and the founders are prepared to work full time in the company, it is ready to pursue Seed funding. Seed funding is also called Angel Capital. Seed funding is appropriate for companies that are pre-revenue and need the funds to complete product development and build out their team in preparation for launch.

## **Tech Square Ventures**

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### **techsquareventures.com**

Tech Square Venture was founded in 2014 by Blake Patton. Blake is a serial entrepreneur, Georgia Tech alum and former Director of the ATDC. Tech Square Ventures has a focus on student led startups, and has funded research spinouts from Georgia Tech.

### **Venture Capital**

Once a spinout company has launched and is receiving revenues it often will turn to Venture Capital to fund scale up.

### **GRA Venture Fund**

The Georgia Research Alliance, in addition to their commercialization grant program, has established a Venture Capital fund.

## **Intellectual Property**

Research at Georgia Tech can result in the creation of intellectual property. The most common form of intellectual property is a patent. Inventions created by Georgia Tech faculty and graduate students either as part of their research or in their field are owned by the Georgia Tech Research Corporation (GTRC). Non-governmental research sponsors may also have ownership of the intellectual property depending on the terms of the research contract.

Inventions must be reported to GTRC using an Invention Disclosure. Within 90 days of receiving an invention disclosure, GTRC is required to inform the inventors of their intent to protect the intellectual property, and then file a provisional patent. The provisional patent must be filed before the researchers disclose their invention either through a published paper or presentation at a research conference. A full utility patent must be filed by GTRC within one year of the filing of the provisional patent in order to continue the patent process.

Once a spinout company launches, they enter into a negotiation with GTRC to license the patent. GTRC will require documents from the company wishing to license the technology, often including a business plan and projected financials. Significantly robust and detailed CD data (e.g.: 100 interviews) and a sufficiently detailed BMC with written explanation should suffice as a business plan.

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## Conflict of Interest Management

**[coi.research.gatech.edu](http://coi.research.gatech.edu)**

Spinouts based on research at Georgia Tech often create conflicts of interest. This is common and should not be a reason to avoid pursuing a startup. Conflicts of interest can arise when there is a professor and a student both involved in the spinout. Conflicts can also arise because of financial commitments. Faculty and researchers must report their plans for commercializing their research so that a management plan can be developed to address any potential conflicts of interest.

Georgia Tech has a dedicated Conflict of Interest management Office (COI Office) that can help with this process. When considering a spinout from Georgia Tech, the first step is to report this using Georgia Tech's ecoi (electronic conflict of interest) reporting system. Faculty and researchers then work with the COI Office to develop and receive approval for a COI management plan.

## Company Formation

Forming a company is an important milestone in the process of creating a spinout. In order to maximize non-dilutive grant funding opportunities, we often encourage teams to delay company formation as long as possible. Note that delaying formation of a company does not eliminate conflict of interest concerns. These must be addressed whether the company has been formed or not. However, once a spinout makes the decision to pursue GRA Phase II or III funding, SBIR grants or seed capital, a company should be formed.

**[ecorp.sos.ga.gov](http://ecorp.sos.ga.gov)**

Because of the low cost and ease of reporting, many research startups begin as an LLC. An LLC can be formed by visiting the Georgia Secretary of State website. There is a \$100 charge to form an LLC. No documents have to be filed with the State to operate an LLC. When a company grows to the stage of needing equity capital, it will usually then be converted to a C-Corporation. There is no need to take on the complexity and cost of forming a C-Corporation before this stage.

## Local Technology Accelerators

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A technology accelerator is a limited time program designed to move a startup quickly through the ideation and discovery stages of their startup lifecycle. Many accelerators work on a cohort model - which means they have a group of between 10 and 20 startups active in the accelerator at the same time. There is competitive acceptance process. Accelerator cohorts generally last from 6 to 12 weeks. Accelerators usually provide a small amount of funding in exchange for equity. They provide credibility and mentoring.

## **Endeavor**

### **[endeavor.org/location/atlanta/](https://endeavor.org/location/atlanta/)**

Endeavor is a non-profit, international accelerator program. The Atlanta program was announced in early 2017. Endeavor has been around for more than 20 years and is in 27 locations around the world. Atlanta is only their fourth location in the US. Endeavor Atlanta received seed funding from Cox Communications. Endeavor is different from other technology accelerators - they do not take equity in the companies they select.

## **Engage**

### **<https://engage.vc>**

Engage was launched in early 2017 by Georgia Tech and ten Atlanta-based corporations. The companies include AT&T, Chick-fil-A, Cox Enterprises, Delta Air Lines, Georgia-Pacific, Georgia Power, Intercontinental Exchange, Invesco, The Home Depot, and UPS. The accelerator will provide mentors, connections to these Atlanta based companies and seed funding. A total of \$15M has been raised to be invested into the companies in the program. It is expected Engage will support 16 companies per year with the first cohort of companies to be selected and supported in mid-2017.

## **Flashpoint**

### **[flashpoint.gatech.edu](https://flashpoint.gatech.edu)**

Flashpoint was founded by Georgia Tech College of Computing Professor Merrick Furst. Flashpoint is located in Technology Square. Flashpoint has a cohort model and is mentor-driven. Startup teams in the program follow the Startup Engineering model created by Merrick Furst. Flashpoint has a mixture of Georgia Tech spinouts and non-Georgia Tech teams. Flashpoint provides financial support in exchange for equity in the startup company.

## **Techstars**

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### [www.techstars.com/programs/atlanta/](http://www.techstars.com/programs/atlanta/)

Techstars is an international accelerator program that is currently in fifteen locations around the world. Techstars Atlanta is located in Ponce City Market about two miles from Georgia Tech. Once a year, roughly a dozen teams are selected to participate as a cohort in a 13-week program. Techstars offers a \$100k convertible note to each team along with a stipend to cover living expenses during the program. Teams are expected to work full time on their business during the program from the Techstars office. This is a mentor-driven program. Techstars model is to take a 8% equity stake in the companies they select. Techstars Atlanta is supported by Cox Communications, but there is no requirement for product or market focus. Applications for Techstars Atlanta are generally solicited in the Spring.

Techstars has no geographic restriction. Teams from Georgia Tech have participated in Techstars programs in other cities, such as the IoT specific program in new York. If Techstars is a fit, teams are encouraged to consider which Techstars program would work best for them and apply.

## Local Technology Incubators

Spinout companies eventually need a place to meet and to run their business. There are local options including co-working and incubators. Technology Incubators also provide mentorship, connections to other startups, connections to industry and social events.

### ATDC

#### [atdc.org](http://atdc.org)

A part of Georgia Tech, ATDC is one of the oldest and largest technology incubators in the US. ATDC was founded in 1981. Nearly 200 companies have graduated from the ATDC, many of them formed from research at Georgia Tech. ATDC is on the second floor of the Centergy Building in Technology Square.

ATDC has three levels of membership. A basic level called **Educate** is open to individuals who want to participate in ATDC educational programs. The Educate level includes the ATDC Financial Literacy course which all Georgia Tech entrepreneurs should take advantage of. Georgia Tech students and faculty can join the ATDC Educate level at no charge.

The ATDC **Accelerate** level is for startups that are in the Customer Discovery and Customer Validation stages of their lifecycle. Accelerate companies need to have their first MVP completed and

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be starting the process of sales. There is direct interaction with the ATDC Entrepreneurs-in-Residence (EIRs). The ATDC **Signature** level is for companies that have raised their first round of funding, and are usually in the Customer Creation stage. Signature companies often move into dedicated office space at ATDC.

ATDC does not invest in their startups and they do not take equity. There is a fee for companies to join ATDC, but the basic level of membership is free for all Georgia Tech students and faculty. When signing up, use the Promotion Codes 'GTFaculty' or 'GTStudent'. Many of the VentureLab research-based startups at Georgia Tech join the ATDC. ATDC may provide space for Signature companies and for some Accelerate companies.

ATDC holds an information session the second Tuesday of each month at ATDC. We recommend all projects plan to attend a session to learn more about what ATDC offers.

## Tech Square Labs

### **techsquare.co**

Tech Square Labs is an incubator and a seed fund located in Tech Square. It was founded by Georgia Tech alums Paul Judge and Alan Nance. Tech Square labs has 25,000 square feet of space for startups. Tech Square Labs has a focus on Georgia Tech spinout companies.

## Sandbox - The Garage

### **sandboxatl.com**

Sandbox is a membership club with a location in the basement of Square on Fifth in Technology Square. The Garage has co-working space and holds events. The Garage is heavily focused on student startups coming out of Georgia Tech.

## Atlanta Tech Village

### **atlantatechvillage.com**

Atlanta Tech Village (ATV), located in Buckhead, was founded by local serial entrepreneur David Cummings. ATV focuses on software startups and has a variety of flexible options for renting space.

## Office Space and Coworking Options

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## Industrious Ponce City Market and Midtown

**industriousoffice.com**

Industrious is a company offering co-working space around the country. They have two locations in Atlanta convenient to Georgia Tech. One is in Ponce City market, the other on Peachtree Street in Midtown, near the High Museum. Industrious offers flexible space on short term leases.

## Spaces Midtown East

**<https://www.spacesworks.com/atlanta/midtown-east/>**

Spaces is located on Peachtree Street near the Fox Theater.

## Strongbox West

**strongboxwest.com**

Strongbox is a co-working space located on Marietta Street less than a mile from Georgia Tech. It is Atlanta's original co-working space, launched in 2009. They have a variety of plans including dedicated offices. The proximity to Georgia Tech makes this a great option for Georgia Tech startups looking for a space close to campus.

## Switchyards Downtown Atlanta

**switchyards.com**

Switchyards is a membership club which offers drop in offices to its members. It is located in Downtown Atlanta near Centennial Olympic Park. Switchyards was founded by two Atlanta technology entrepreneurs and they focus on building a thriving community of designers, artists and entrepreneurs. Switchyards is well suited for companies with a consumer focus.

## Wework Colony Square

**wework.com**

wework is a company offering co-working space all over the world. The closest location to Georgia Tech is in Colony Square, a Peachtree and 14th Street. wework offers both dedicated desks and private offices. Wework could be a good option for someone travelling significantly that needs to have an office to drop into when in San Francisco, New York, London, etc.



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## How to Get Started

Engaging with VentureLab is a simple process. Send us an email and we will have one of our Principals respond and schedule a meeting with you.

**[venturelab@gatech.edu](mailto:venturelab@gatech.edu)**