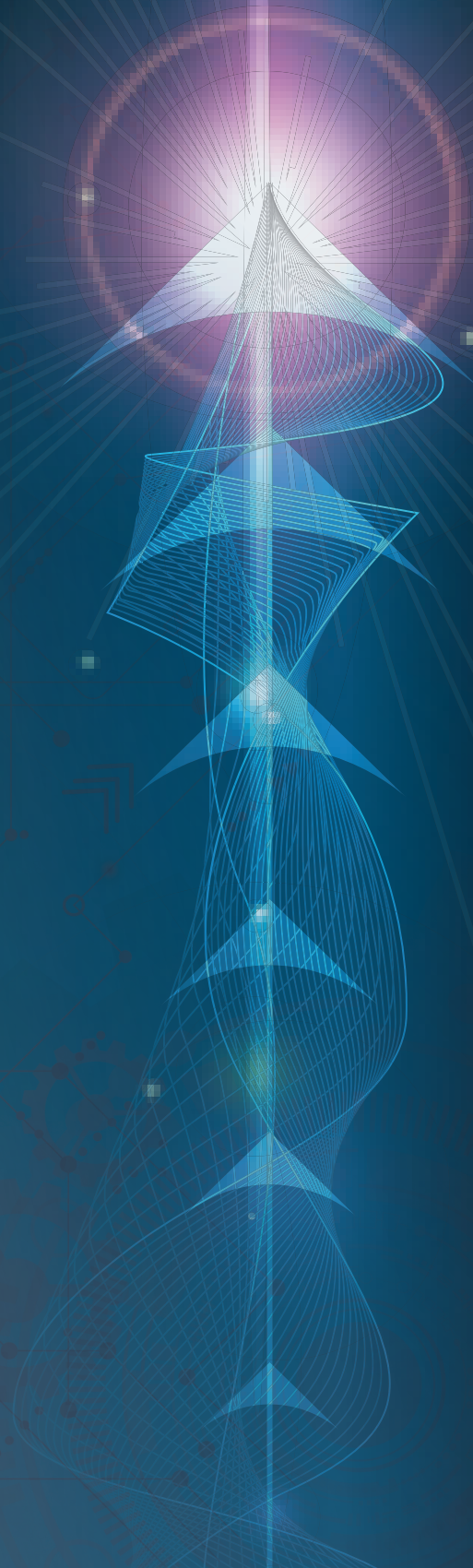


# Entrepreneur's Guide to Start-Ups



JOHNS HOPKINS  
APPLIED PHYSICS LABORATORY

Office of  
Technology Transfer









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You are probably reading this guide because you are interested in how the Applied Physics Laboratory (APL) enables individuals and teams from APL to spin off APL know-how and technology. As an APL employee, you may be interested in someday taking a leave of absence and launching a new venture. Designing, leading, and building a new technology venture is not for everyone, but APL offers numerous resources, including this guide, to support qualified, prospective entrepreneurs.

This “Entrepreneur’s Guide to Start-Ups” provides a broad overview of the start-up process as well as a summary of best practices, available resources, and applicable policies associated with start-up activity at APL. It is primarily intended for APL staff members who are interested in launching a start-up company based on APL intellectual property.

This guide is for Informational Purposes Only. APL staff members should refer to any applicable guidance and policy documents for the Laboratory’s official policies or contact APL’s Office of Technology Transfer (OTT) for additional information on the topics discussed in the guide.

This guide is intended to be a companion publication to the APL “Inventor’s Guide to Technology Transfer” ([https://aplweb.jhuapl.edu/innovation/ott/Documents/18-04761\\_OTT\\_Inventors\\_Guide\\_FINAL.pdf](https://aplweb.jhuapl.edu/innovation/ott/Documents/18-04761_OTT_Inventors_Guide_FINAL.pdf)).

# STRATEGY



As part of JHU's Innovation Ecosystem, APL's commercialization and technology transfer strategy seeks to:

- **transfer** knowledge and technology responsibly and with speed, agility, and transparency;
- **partner** strategically with others to support research and development across APL, including in fields advancing health-enhancing capabilities; and
- **discover** technological advances throughout the world to help solve the nation's most complex national security and space exploration challenges.

APL's Office of Technology Transfer (OTT) manages APL-affiliated intellectual property (IP) to help ensure its broadest possible impact. The role of OTT and its experienced licensing staff is to support APL staff members in this process.

APL staff members are encouraged to explore how to disclose IP and participate in the technology transfer process.



## Office of Technology Transfer

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External website: <http://www.jhuapl.edu/About/OTT>

OTT staff: <https://aplweb.jhuapl.edu/innovation/ott/Pages/Team.aspx>



# OVERVIEW

## What is a start-up?

For the purposes of this guide, a start-up company (or start-up) is a new business venture that is in its earliest stage of development and outside APL's business enterprise. Components of a successful start-up include a compelling concept, a strong market opportunity, a competitive advantage, a sound business and financial plan, an experienced and customer-focused management team, and opportune timing.

Start-up entrepreneurs must have unbending passion, optimism, and faith in their venture, along with an eagerness to commit long hours of their own time and their own resources to developing the technology that is at the core of their business. Many start-ups fail even if the core technology is innovative and promising.<sup>1</sup> However, when a start-up develops and brings to the market the right technology at the right time, the technology has the potential to significantly benefit society.

## How are start-ups relevant to APL?

APL's primary mission is to support the mission of its sponsors, which is often accomplished by transitioning IP directly to the government. However, there are other important ways to contribute to national preeminence, including commercializing IP and supporting entrepreneurship. As highlighted in the insert on this page, fostering entrepreneurial activity at APL is aligned with the Laboratory's Centennial Vision, which envisions a culture of experimentation and of embracing risk in order to have a positive impact. The start-up resources, programs, and policies described in this guide will help enhance APL's efforts to be a magnet for the nation's top talent and a sought-after partner at the center of a vibrant innovation ecosystem, while further strengthening APL's role as a vital and integral member of JHU.

There are many vehicles for expanding the impact of APL-based technologies. Founding a start-up that licenses the

technology, develops it for commercialization, and then brings it to the market for commercial access, including by sponsors, can be one such vehicle. This guide is primarily intended for APL staff members interested in launching a start-up based on IP that is owned by JHU through APL.

Whether it is licensing to a start-up or an established company, APL seeks to maximize the chances of successfully transferring the technology to increase its impact while prioritizing the Laboratory's mission to make critical contributions to our nation's critical challenges.

## How can OTT support your entrepreneurial aspirations?

OTT realizes that most APL technologies are early stage and that a significant investment of both time and resources is required to translate a discovery or invention into new products and services that can be commercialized in the marketplace.

## Centennial Vision

When we celebrate our centennial, APL will be a treasured national resource, widely recognized for our technical leadership and bold, previously unimaginable solutions to the nation's most complex national security and space exploration challenges. Always anticipating the future, we will also be providing decisive advantage to the nation in complementary new areas. Never losing sight of why APL was created, we will be **nurturing a culture of experimentation, embracing risk**, and exemplifying what it means to be a trusted research and development laboratory. Furthermore, APL **will be a magnet for the nation's top talent** and a **sought-after partner at the center of a vibrant innovation ecosystem**. Finally, as an **integral member of one of the world's finest universities**, we will be sharing knowledge and technologies that benefit our society and improve the lives of people throughout the world.



Although it cannot guarantee success, OTT can help identify resources and expertise to assist APL staff members with the start-up process. For example, OTT can connect you with various entrepreneurial resources provided by Johns Hopkins Technology Ventures (JHTV), the state of Maryland, and Howard County, as well as other helpful resources, including angel and venture capital investors and advisors knowledgeable in your target market space. Once a start-up is formed, in order to commercialize an APL technology, OTT may negotiate with the start-up to craft an appropriate technology transfer agreement that is designed to help the start-up succeed. Additional details regarding resources and OTT agreements are provided in this guide and its companion publication, APL's "Inventor's Guide to Technology

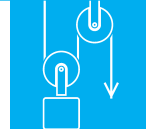
Transfer" ([https://aplweb.jhuapl.edu/innovation/ott/Documents/18-04761\\_OTT\\_Inventors\\_Guide\\_FINAL.pdf](https://aplweb.jhuapl.edu/innovation/ott/Documents/18-04761_OTT_Inventors_Guide_FINAL.pdf)).

OTT is an enterprise group within the Legal and Commercialization Branch of APL's Central Laboratory. It includes technology managers who have strong technical backgrounds and who are highly experienced in IP management, licensing, and business development. Aligned with one or more APL sectors, departments, and mission areas, each technology manager works closely with management and technical staff as a trusted partner to ensure APL's IP objectives are met in accordance with sponsor sensitivities and APL's overall goals as a university affiliated research center (UARC).

*NOTE: Throughout this guide, unless specifically described otherwise, the term "inventor" includes individuals listed on patents or patent applications as well as contributors who have created IP that is disclosed but not patented.*

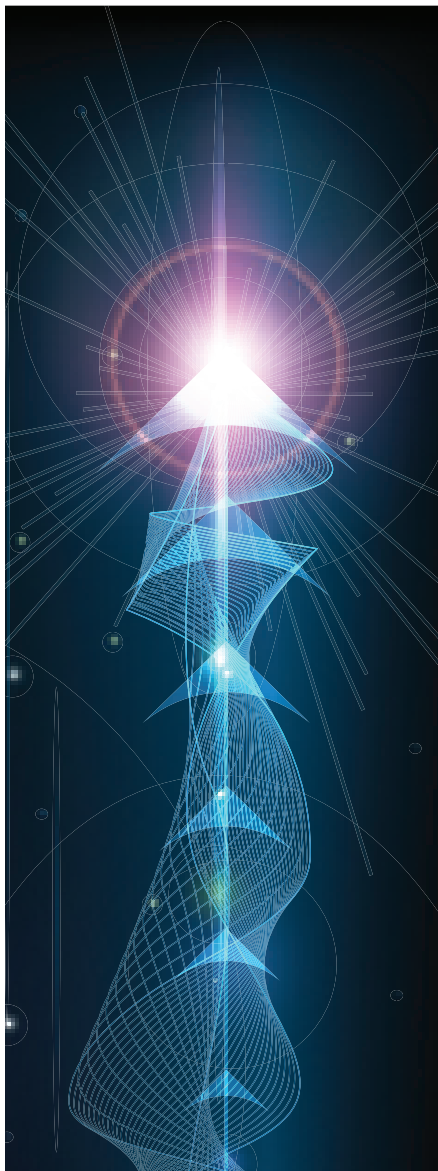


# APL ENTREPRENEURIAL STAFF & ALUMNI PROGRAM (AeSAP)



## What is AeSAP?

AeSAP seeks to ensure that APL remains a sought-after partner at the center of a vibrant innovation ecosystem, as well as a magnet for the nation's top talent, and that APL continues to share knowledge and technologies that benefit our country and society.



The goals of AeSAP are as follows:

(1) to promote innovation; (2) to support talent recruitment and enthusiasm; (3) to expedite and facilitate the process to re-engage or re-employ talented staff; and (4) to leverage the private sector to mature and manufacture APL technology into viable commercial products by enabling staff members who wish to pursue their entrepreneurial aspirations of starting or joining a company.

Staff members who want to start or join a start-up company to pursue their entrepreneurial goals may be approved to have the opportunity for re-employment for up to a 2-year period. Such staff members may also be allowed to license APL IP to pursue their start-up. APL will also support approved staff members by offering entrepreneurial education.

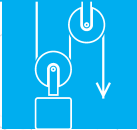
Approved staff members planning to start a company based on APL IP may opt to participate in a business plan competition in which up to two staff members will be selected each year for an Archimedes Award. The Archimedes Awardees will be granted workspace, mentoring, and other support at JHTV and APL benefits ([https://ecm.jhuapl.edu/sites/GP/Docs/APL\\_Entrepreneurial\\_Staff\\_and\\_Alumni\\_Program\\_\(AeSAP\).docx](https://ecm.jhuapl.edu/sites/GP/Docs/APL_Entrepreneurial_Staff_and_Alumni_Program_(AeSAP).docx)) consistent with the benefits provided to staff members who are on a "Leave of Absence for Professional Reasons."

## How does AeSAP work?

The program consists of three phases. In Phase I, interested staff members apply to participate in AeSAP. If approved by their sector or department head, staff members who are not interested in licensing APL IP may discontinue their employment relationship with APL and sign an agreement providing for re-employment if they return to APL within 2 years. Approved staff members interested in licensing APL IP proceed to Phase II. In Phase II, option agreements to license APL IP are negotiated, and staff members may opt to participate in the business plan competition to be selected for an Archimedes Award. The Archimedes Award consists of an unpaid professional leave from the Laboratory; an APL benefits package consistent with that type of leave; and working space and entrepreneurial support while in the APL program. In Phase III, Archimedes Awardees who are interested in returning to APL and those former staff members who were approved for the opportunity for re-employment and are interested in returning to APL may contact APL's OTT to initiate that process.

At any time before separation from APL or before beginning a leave of absence, a staff member can, for any reason, choose to withdraw from AeSAP and remain an active employee at APL by notifying their supervisor.

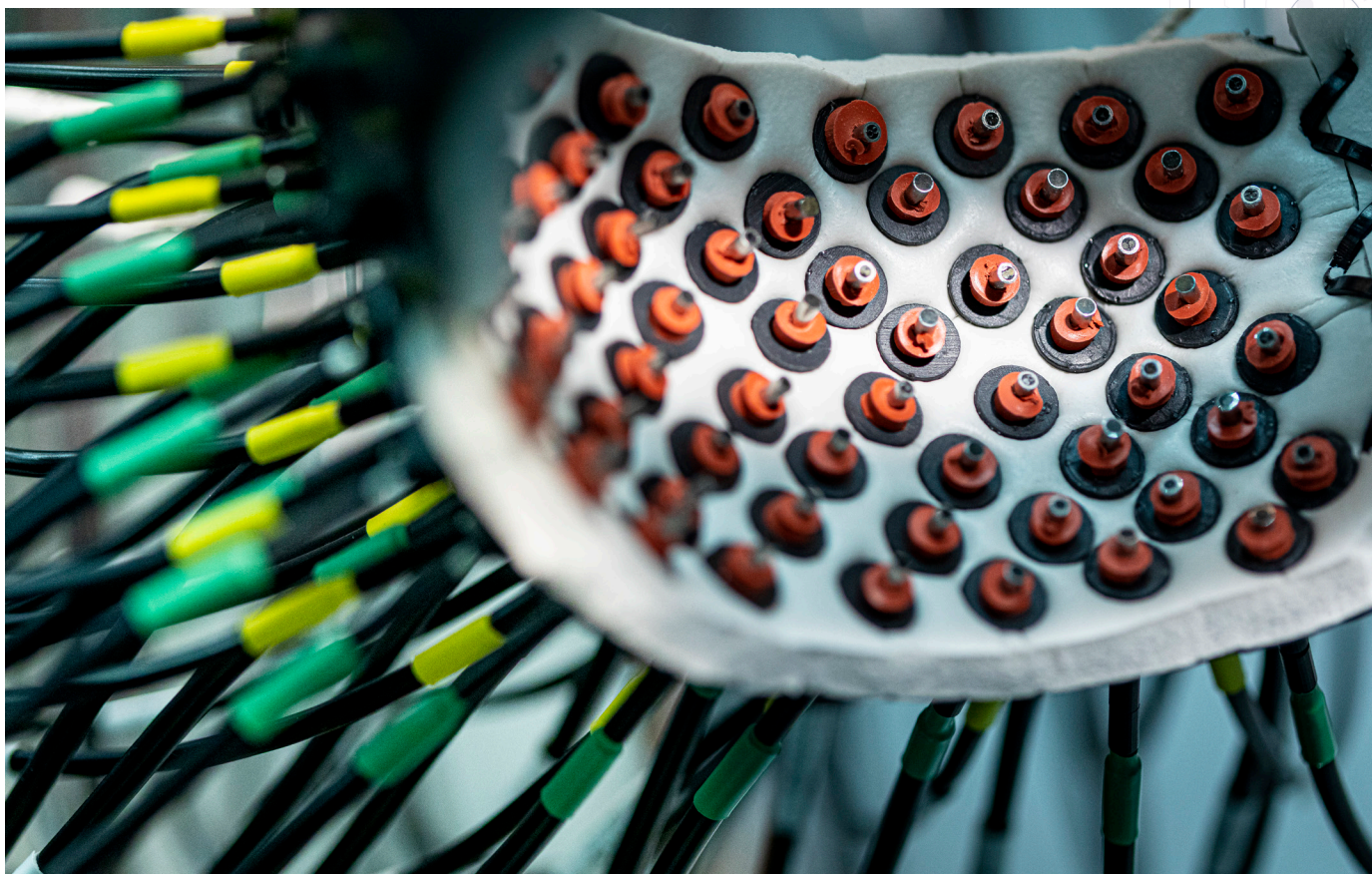




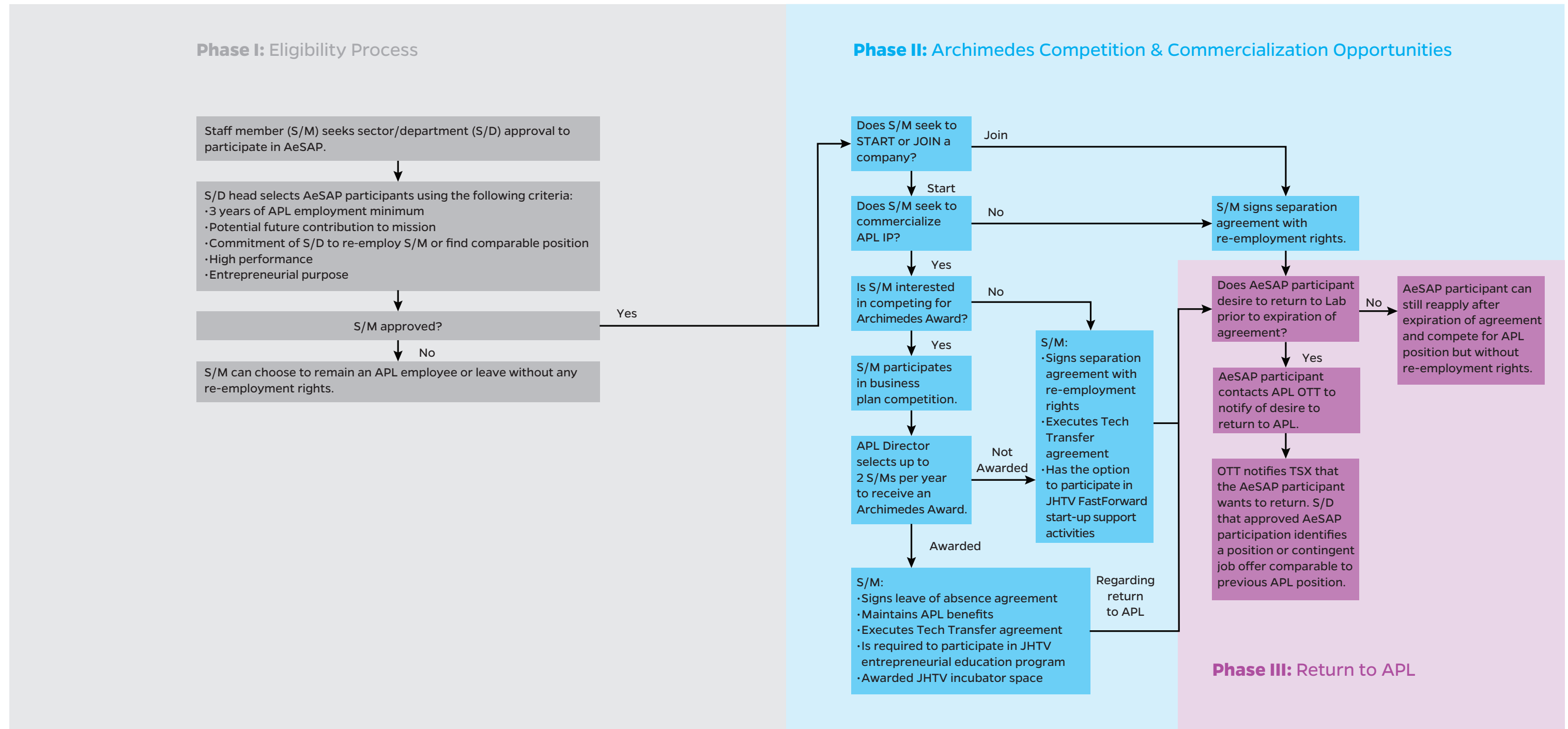
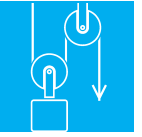
## AeSAP Benefits

1. Opportunity to start a company based on APL-licensed IP
2. Possibility for re-employment for up to 2 years
3. Access to a suite of entrepreneurial resources at JHTV's FastForward innovation hub
4. Participation in a business plan competition for the Archimedes Award for additional benefits

Additional details can be found in G&P #003-0005, APL Entrepreneurial Staff & Alumni Program (AeSAP) ([https://ecm.jhuapl.edu/sites/GP/Docs/APL\\_Entrepreneurial\\_Staff\\_and\\_Alumni\\_Program\\_\(AeSAP\).docx](https://ecm.jhuapl.edu/sites/GP/Docs/APL_Entrepreneurial_Staff_and_Alumni_Program_(AeSAP).docx)).



The diagram below provides an overview of AeSAP, including specific steps associated with Phases I–III.





# LAUNCHING A START-UP



## *What does it take to launch a successful start-up?*

Launching a successful start-up requires commitment, dedication, and perseverance. Entrepreneurs spearheading a new company's formation will be the key champions for the technology and the start-up. In addition to navigating the standard technology transfer process, they are responsible for a variety of tasks, such as identifying the market opportunity, developing a business plan, securing beachhead customers, and pursuing financing. Every start-up follows its own unique path. But there are many common steps to getting the business off the ground, as discussed in this section.

## *How should I get advice and guidance on forming a start-up?*

Throughout the start-up process, advice and mentorship are invaluable in building the foundation for a successful business. APL, in partnership with the JHU ecosystem, cultivates a strong entrepreneurial spirit and has many resources to help with networking and to provide guidance for a path to commercialization. JHTV offers formal programs and entrepreneurship classes, and combined with informal advice from advisors, friends, and colleagues, these resources can help shepherd entrepreneurs through various elements of the start-up process—for example, writing a business plan, building a management team, attracting board members, and

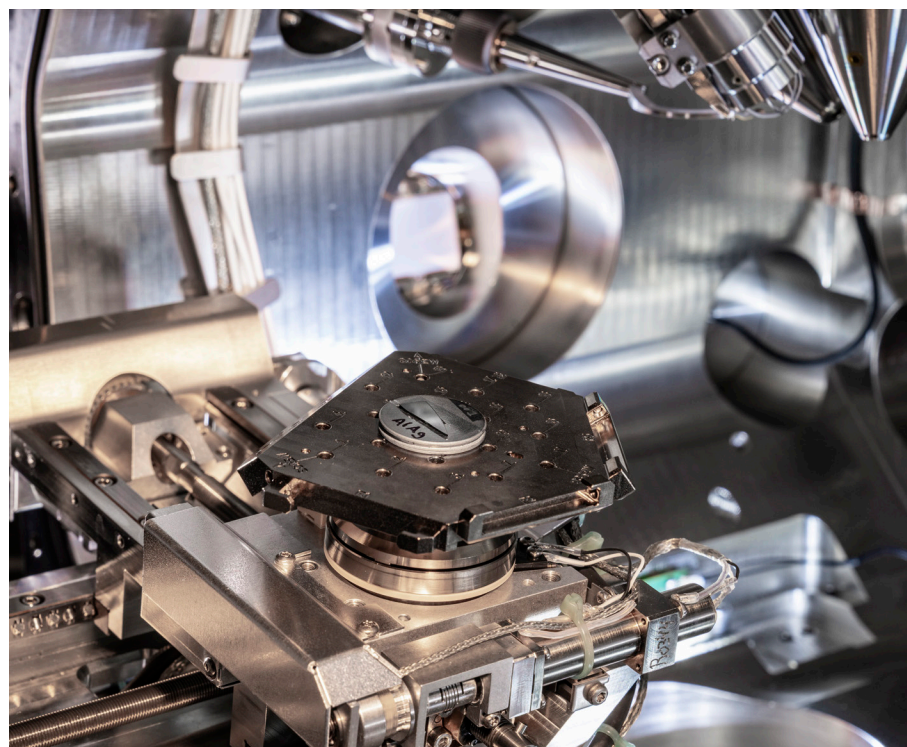
meeting potential investors. Additionally, OTT staff members can provide guidance based on their significant experience with and connection to the start-up community, including starting their own companies and investing in start-ups.

## *What should I consider in making the decision to form a start-up?*

Several key factors should be considered when deciding to form a start-up:

- **Technology innovation and valuable, protected IP** – Is broad patent or other IP protection possible? Is there background IP that is owned by others? Will the company have
- **Development risk** – How far along is the technology? How much time and money will be required to bring a product to market?
- **Development costs versus investment return** – Can investors obtain their required rates of return (e.g., 10× the initial investment in 5 years)?
- **Product strategy** – Does the technology lend itself to opportunities for multiple products and/or platforms?
- **Market size, dynamics, and potential** – Is the market big

freedom to operate to develop the product?





enough to justify financial investment and support the desired rates of return? Is it controlled by a few players? Is there a healthy growth trend?

- **Financial potential** – What market share can be obtained? Is it worth the effort?

Entrepreneurs should develop a thoughtful business case to understand the market potential, competition, and funding needs. This should include a plan for developing the technology and attaining sufficient revenue to sustain and grow the company. This plan will be useful when meeting with investors and pursuing funding.

### *What are the necessary components of a typical business plan?*

A business plan should be clear and concise. It will be easier to “sell” the vision to investors and attract management talent with a formal business plan. Investors are interested in investing in start-ups with high growth potential. The business plan should address what investors want to know, including, for example, what the compelling concept is, whether the company will have a competitive advantage (including whether the company will secure patent rights or other IP protection), what the technology’s market and financial potential is, and whether the company has a proven management team. The business plan is usually a confidential document and should be carefully distributed.

Specific components of a typical business plan may include, for example (see also <https://www.entrepreneur.com/article/238926>):

#### **1. Problem Statement and Solution**

- What problem does the invention solve? What is the unmet need?
- What is the magnitude of the proposed advance? How different is it from existing solutions? Is this a marginal or groundbreaking improvement to current technology?

#### **2. Value Proposition**

- What is the product/service that addresses the unmet need?
- What is the size of the unmet need?
- Does the market change from year to year?

#### **3. Customer Discovery**

- Who is the buyer/customer and is this the same as the end user?
- What are the market segments and in which do you operate? What is the size of the market segment?
- Do you have a process for continual deployment based on customer feedback?

#### **4. Competition**

- What is the competitive landscape and what makes this product/service unique?
- Do you know your competitors in detail (features, customer profile, demand creation strategy)? What do customers like most about your product or service? What do they like least?

#### **5. Capital**

- How much funding has been invested to date?
- How much capital will be required to take the product to market?

#### **6. Milestones to Move the Product to Market**

- What additional experiments must be completed to move this technology to licensing, commercialization, venture investment, or industry collaboration?
- Will the technology scale?
- Are regulatory or other third-party approvals required?

#### **7. Commercial Plan**

- What type of company might license the technology?





### How can I mitigate risk factors in a start-up?

One of the most prominent methodologies employed to mitigate risk factors in a start-up is the “lean start-up” strategy proposed by Eric Ries<sup>2</sup> and others.<sup>3</sup> Ries, who was a venture advisor at venture capital firm Kleiner Perkins, provides an approach to creating and managing a start-up and getting a desired product into the hands of customers faster.

A major risk factor facing a start-up is whether it can establish sufficient product/market fit, which would allow the start-up to enter a strong market with a product that can satisfy that market. Product/market fit is typically achieved by creating a so-called “minimum viable product” (MVP) that addresses an existing need or problem. Ries’s approach helps to mitigate the risk of not establishing sufficient product/market fit.

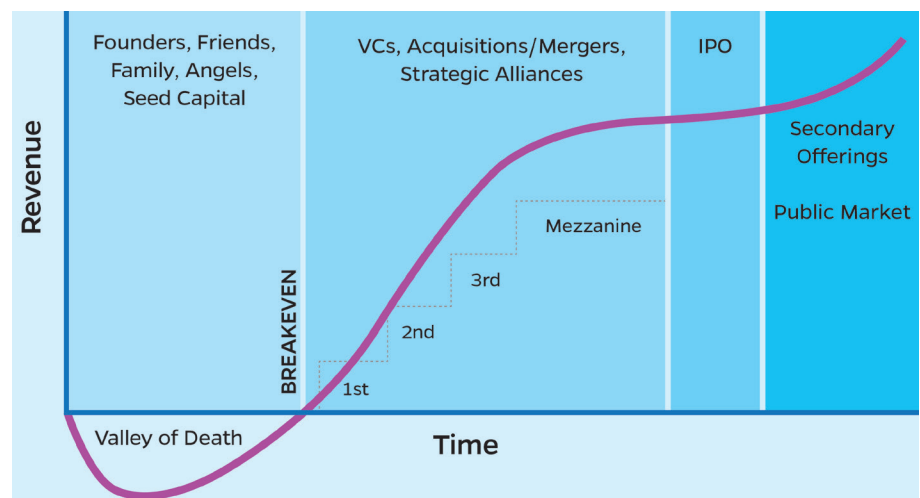
The methodology consists of four phases:

- **Customer discovery** – This phase involves defining a set of hypotheses about the market and customers and thinking about ways to prove or disprove the hypotheses. It is important to talk to customers to test the hypotheses, gain insights into the problems, and test whether the solution is viable. At the end of this phase, you will end up with strong hypotheses and decide to proceed or pivot.
- **Customer validation** – This phase involves performing more rigorous tests of whether each strong hypothesis is true and whether the resulting business model is repeatable and scalable. This is done by selling a product pitch. In the process of doing so, one not only tests whether customers are serious, but also gains insights about pricing and budget issues as well as insights for generating a sales road map. At the end of this phase, you will adjust any hypothesis, if necessary, and decide to proceed or try a new approach or angle.
- **Customer creation** – This phase is the start of actual business model execution. It includes building the product and using sales and marketing strategies to drive customers into your sales funnel.
- **Company building** – This phase is when the lean start-up methodology ends and the start-up becomes a real company.

### What types of funding are available for start-ups?

Although the amount of funding needed for a start-up can vary widely, commercializing technology is typically a capital-intensive process. Entrepreneurs need to present their opportunity to people with the funds to help them make it happen. Typically, these are venture capitalists (VCs), angel investors, and—perhaps in the initial stages—friends and family.

This graphic is an example of a start-up financing cycle using traditional funding sources through an initial public offering (IPO). There could be more or fewer rounds of funding. The first, second, and third rounds can



Start-up financing cycle.



be equivalent to Series A, B, and C investment rounds.<sup>4</sup>

### Angel Investing

Angel investors are typically high-net-worth individuals who have a personal interest in funding new companies. They are often willing to invest in earlier stages and with smaller amounts of money than VCs in exchange for equity. They can take passive or active roles in the start-up and typically have a longer investment horizon than VCs.

### Venture Capital

Compared with angel investors, VCs can invest larger amounts of money (usually millions of dollars) in a company. In exchange, they tend to receive more equity, seek to exercise some control of the company, and bring in experienced management talent to help guide and grow the company. Sometimes they invest in several rounds of funding and are part of a larger consortium of company investors.

### Nontraditional Funding

Start-ups may also investigate and pursue funding from nontraditional sources. Some examples of these are:

- **State economic development funding** – The Maryland Technology Development Corporation (TEDCO) invests in Maryland start-ups with the

primary goal of economic development in the state.

- **Government grants** – Certain research grants are available through programs such as SBIR/STTR (Small Business Innovation Research and Small Business Technology Transfer; [www.sbir.gov/](http://www.sbir.gov/)) and the Department of Energy (<https://arpa-e-foa.energy.gov/>).
- **Banks** – Banks do not usually participate in equity investments in new companies, but they are a source of loans, particularly for capital purchases when there is some kind of collateral (such as large equipment).
- **Crowdfunding** – Various crowdfunding companies enable entrepreneurial fundraising by pooling small investments from a network of individuals.

#### How do investors evaluate a start-up?

Investors listen to pitches constantly, and only a small portion of start-ups get funding. The investors will determine whether the start-up meets their strategic and financial goals and whether the company fits into their current portfolio of investments. VC funds typically target at least an overall 20% annual return on their fund, which is significantly higher than other investment vehicles such as stocks and bonds.

Investors have specific criteria by which they evaluate any company in which they are considering investing. As an example, a VC might consider the following criteria in making an investment decision:

- Technology impact;
- Ability of start-up to attract other investors;
- Feasibility of technological approach and likelihood of success; and
- Market space and ability of technology to fill gaps.

Investors typically perform their due diligence in researching a start-up before funding new opportunities, and they often view the fact that a new company is working with APL positively in this analysis. For example, OTT's involvement may provide an extra measure of reassurance to investors that IP rights are being properly secured by the company. For further details, see Funders and Founders' infographic explanation of how start-up valuation works.<sup>5</sup>

#### What is meant by "exit strategy?"

Founders and investors typically plan to recoup their investments in the start-up via exit strategies. For example, VCs generally hope to sell their equity in a portfolio company within 3–7 years, ideally through an IPO. Another exit strategy could be through a merger or acquisition involving another business entity instead of an IPO.

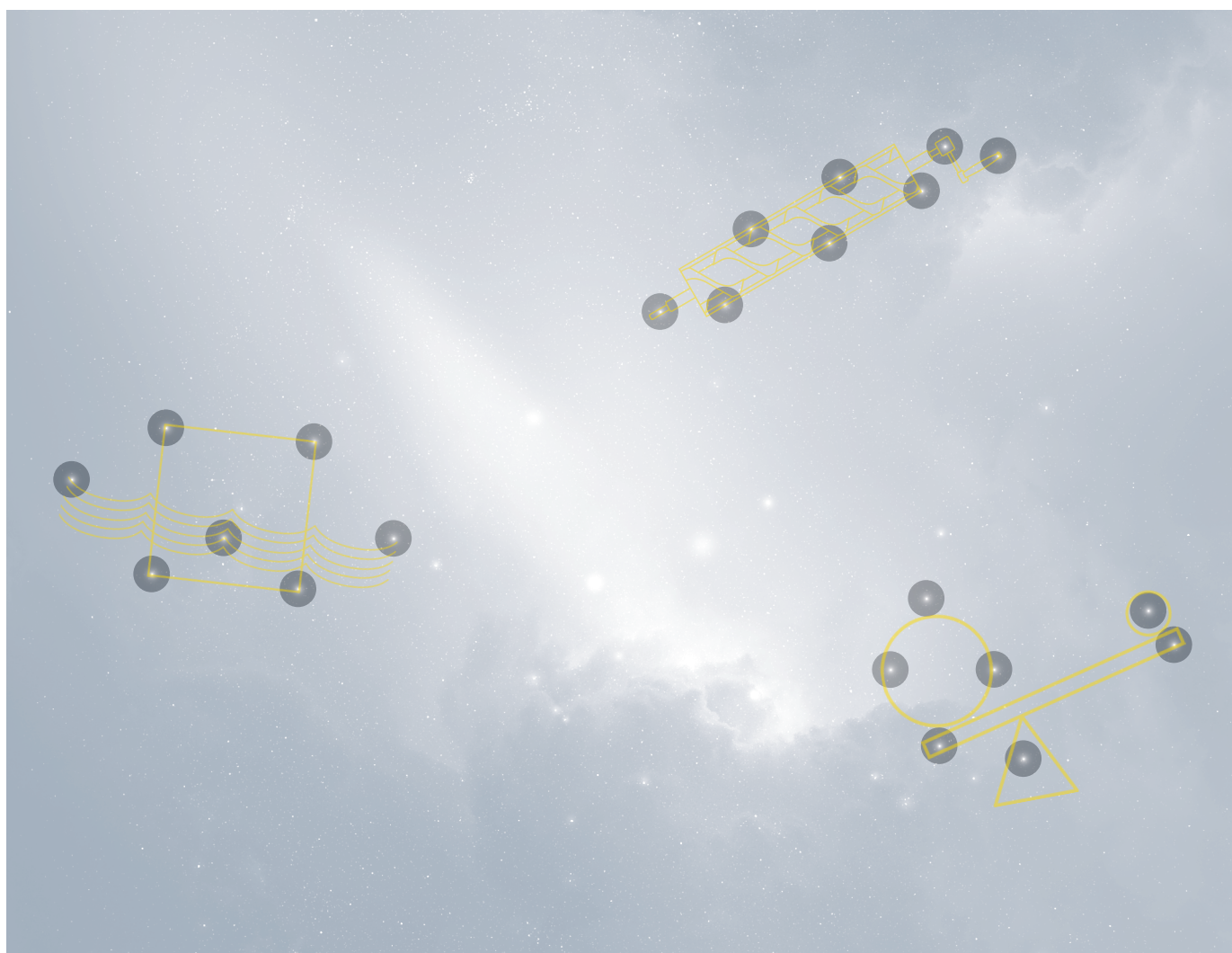




### What are some of the pitfalls?

New company formation is a high-risk proposition. Although many start-ups are successful, most are not for a variety of reasons.<sup>6</sup> Keep in mind that failing fast and learning from mistakes are important parts of the cycle of entrepreneurship and can ultimately facilitate success. Some common problems that can cause start-ups to fail include the following:

- **Inexperienced management** – A strong, experienced, cohesive team is required for a start-up company to be successful. Problems can arise if founders or other members of the team do not have enough start-up and business experience or if founders, new management, and investors do not have the same strategic vision.
- **Lack of funding** – A start-up needs sufficient capital to overcome technical challenges, reach critical business milestones, and progress to the next phase of development. To attract investors, the company must have a solid business plan and a strong management team.

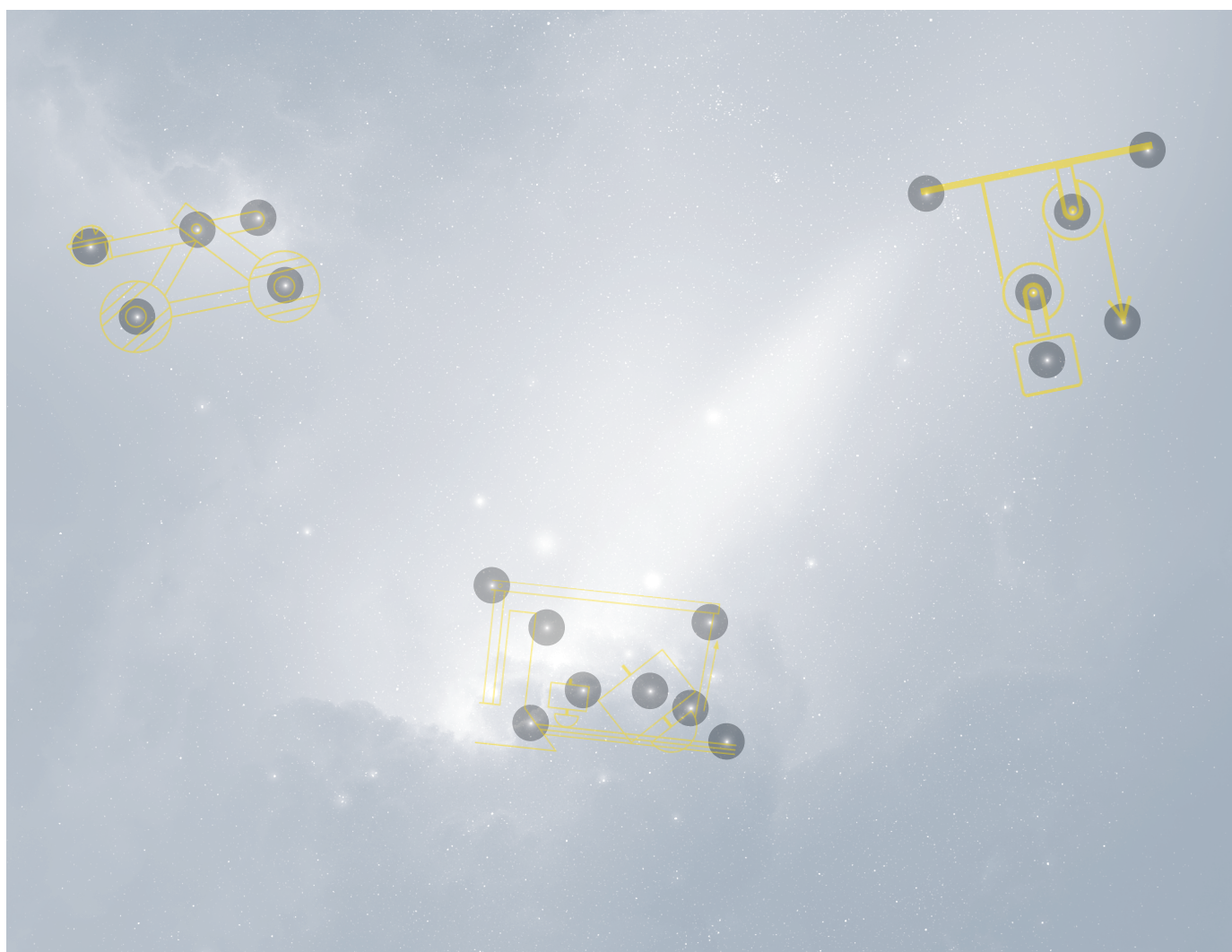




- **Technology does not meet a commercial need** – Sometimes the science is innovative and exciting but does not correlate to a critical commercial need, or current solutions are still better than the new technology.
- **Timing** – Even when a commercial need exists, the company may miss the market. Sometimes this is because the market

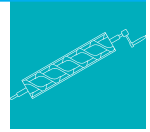
is not ready for a product (e.g., it is too early, the technology is still too expensive, or the need is unrecognized). Sometimes it is because the product is too late to the market and the need has already been filled by a different technology or because competitors have leapfrogged over the company with an even better product.

- **Marginal niche** – If the target market is smaller than expected, the company may not meet its financial targets.
- **Bad luck** – Sometimes events outside the entrepreneur's control can negatively impact a company.





# PITCHING TO INVESTORS



## *Is there a one-size-fits-all template for investment presentations?*

Pitching to investors is an essential part of the start-up's success. However, a template for the perfect slide deck does not exist. Along your start-up journey, you will certainly receive conflicting advice. This section serves as a guide and may help you make the best adjustments for your start-up. Always remember that potential investors will study your deck; this means that company values, like integrity and excellence, begin to be instilled and judged early.

## *What are some basic points to keep in mind?*

- Simpler is better. Present one idea or image per slide.
- Include the date and a page number on every slide except for the cover.
- Each page should have an informative/descriptive title—nothing generic.
- Insert your logo as a header or footer on every slide.
- Prominently indicate which slides contain confidential information.
- For security and formatting reasons, send presentations in PDF format. However, bring your original file to the event in case you need to make unexpected, last-minute changes.

- You have the greatest attention from your audience in the first 60 seconds. Do not waste them.

## *What should be included in the presentation?*

### **1. Cover page**

- Tell the investor who you are and why they should remember you.
- Include a tagline—one sentence or phrase that captures how you want to be known.
- Include your organization's name, logo, and slogan (if you have one) as well as your name, title, and contact information.

### **2. Executive summary**

- Capitalize on the first 60 seconds when you have maximum investor attention by concisely telling investors why you are a compelling investment opportunity.
- Start with your investment thesis (i.e., the few major points that make your investment proposition appealing). This includes the opportunity/problem, your solution (value proposition), and what makes your solution compelling.
- You should aim to heighten interest in a concise fashion, NOT to tell the whole story.

- The rest of the presentation will support these claims in a logical, supportive fashion.

### **3. Opportunity or problem**

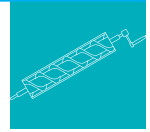
- What is the opportunity/problem that you are addressing?
- Do not give unrealistic market projections.
- Define the market you are going after—incidences, procedures, dollars spent, and the REASONABLE percentage you can obtain.
- If possible, show actual results and let the investors extrapolate for you.

### **4. Solution**

- Tell investors that you have something that exploits the opportunity or solves the problem(s) above.
- What is your value proposition?
- What problem(s) are you solving?
- What opportunities are you creating?
- Solutions should match the opportunities/problems cited above. Product features are NOT value propositions.
- If possible, show actual results and data.

### **5. Twenty-four-month action plan**

- What is your action plan and critical path—what research,



- product development, regulatory, and other milestones do you intend to meet?
- What resources do you need to put in place—capital, management, technical, other?
- Identify risks and state how you plan to address them.
- Be clear and decisive.

#### **6. Business model**

- How do you plan to generate revenue and profit?
- How will you capture value?
- Focus on one segment and revenue stream.
- If you have legitimate long-term opportunities, mention them at the end of your 24-month action plan as areas for exploration.
- Focus on the metrics that matter in driving the business and creating value.

#### **7. Competitive analysis**

- Tell investors why you are better than competitors and can succeed despite risks and challenges.
- What are the key success factors and metrics as defined by users and purchasers?
- How do you compare against others? A table format is preferable for showing this comparison.

- Express your competitive advantages clearly and concisely.
- Pictures, diagrams, and prototypes are worth a thousand words each.

#### **8. Financial forecast and use of funds**

- Tell investors what you are going to do with their money over a specific time period.
- What is the amount of financing sought?
- What are the planned uses and milestones that match your 24-month action plan?
- What are the planned sources of funding?
- Describe funding and sources to date, including significant grant or philanthropic funding, to establish credibility.

#### **9. Management team**

- Tell investors why they should partner with you.
- Provide backgrounds of key executives, advisors, and investors.

#### **10. Summary slide**

- Remind investors why your proposition is a compelling investment opportunity.
- Repeat the investment thesis and value proposition or the few major points that you want remembered.

- Leave this slide up during your Q&A.
- Wait until you are walking out the door to thank individual attendees.

#### **11. Appendix**

- Provide structured answers and data to address likely objections and technical questions.
- Slides should provide additional information or address significant risk factors.
- Your ultimate goal is to have a comprehensive slide deck from which you can easily extract shorter versions to match each presentation's objectives and duration.

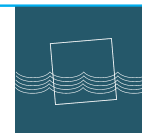
#### ***How long should the presentation take?***

It depends on the objectives at hand and the number of slides to be presented:

- 30-second elevator pitch: opportunity, solution, competitive advantage, compelling business model
- 7-slide pitch: 5 minutes or less
- 10- to 15-slide presentation: 10–15 minutes
- 15- to 30-slide presentation: 30 minutes
- 30- to 50-slide detailed presentation: 30–60 minutes



# LICENSING IP FROM APL



## *How are APL inventors involved in the licensing process?*

The licensing process starts when APL inventors disclose their new ideas (<https://aplweb.jhuapl.edu/insideapl/cil/IP/Pages/Intellectual-Property-Disclosure.aspx>) and continues as they collaborate with OTT throughout the life cycle of the technology. OTT carefully considers inventor feedback and strives to keep inventors informed along the way. OTT encourages APL inventors to recommend leads on potential licensees, to provide input for assessing technical and market feasibility, and to offer suggestions on which licensing strategy would be best to commercialize the technology. However, APL inventors do not participate in OTT's negotiation of license agreements with potential licensees.

In the case of a start-up formed by an APL inventor, the APL inventor is not permitted to directly negotiate or execute license or other technology transfer agreements with OTT on behalf of the start-up while employed by APL. This approach is based on the Laboratory's conflict of interest (COI) policies. However, under certain circumstances, a representative of the start-up who is not the APL inventor may negotiate or execute license or other technology transfer agreements with OTT. In addition, if the APL inventor has a COI that arises as a result of the start-up obtaining a license to APL IP, the APL inventor will need to seek review by APL's Principal Ethics and Compliance Officer (PECO).

An exception is made for Archimedes Awardees under AeSAP, who are permitted to negotiate and execute license or other technology transfer agreements with OTT on behalf of their start-ups while on a leave of absence for entrepreneurial reasons.

## *Does OTT give any preferential treatment to APL inventor start-ups when selecting a licensee?*

OTT generally selects licensees on the basis of their ability to commercialize technology successfully. Sometimes established companies have the industry experience as well as technical and financial means to best commercialize the technology. At other times, APL inventor start-ups are in the best position to bring a technology to commercial fruition because of the expertise and passion of the APL inventors associated with the start-up. License negotiations with APL inventor start-ups must generally fall within OTT's customary range of terms and conditions for similar licenses to companies not associated with APL inventors.

## *How should my start-up share information about IP that is licensed from APL with potential investors or partners?*

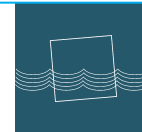
APL entrepreneurs may need to divulge proprietary or confidential aspects of the IP to potential investors to generate interest. A nondisclosure agreement (NDA) may be used to protect the confidentiality of IP during

evaluation by third parties, such as potential investors or corporate partners, thereby facilitating open discussions regarding the IP under the protections afforded by the NDA. The management or legal counsel for the start-up typically negotiates and executes NDAs on behalf of the company with third parties. However, some venture capital firms and strategic corporate investors may be reluctant to execute NDAs because they fear doing so would constrain their existing portfolio of technologies or future opportunities. For inventions protectable by patents, some entrepreneurs are more comfortable sharing proprietary or confidential details of the invention only after a patent application has been filed.

Start-ups that have licensed APL IP should be aware of any obligations imposed by APL with regard to the distribution and handling of APL confidential and proprietary information. Before sharing APL confidential and proprietary information with third parties, the start-up should review its obligations under the applicable agreement and coordinate with OTT to ensure that appropriate measures have been considered to protect the APL IP.

## *Which comes first, the license agreement or the funding agreement?*

Investors usually want to be sure the start-up has a license to the technology before investing in the company, but



the start-up entrepreneur often does not know what kind of license (e.g., field of use, financials, etc.) investors require. A term sheet is a document outlining the material terms and conditions of a prospective license and is a tool OTT uses for simplifying the negotiating process. If it is not feasible at this early stage to fully resolve all of the details in a term sheet, one solution is for the start-up to take an option to a license, with the terms of the license to be negotiated later.

#### **What is an option agreement and can a start-up take that instead of a full license?**

An option agreement is often used to reserve IP rights while a start-up evaluates the technology, explores funding opportunities, and raises the capital needed to license the rights in question fully. Option agreements may require a start-up to pay a fee to APL to reserve those rights. Start-ups sometimes prefer this route, and OTT may grant an option to APL IP under terms that are appropriate for the technology and the start-up's business plan.

#### **How long does it take to obtain a license to APL IP from OTT?**

There are numerous factors that may impact the length of time required to negotiate and execute license agreements for APL IP. While every license deal is different, OTT has typically negotiated and executed license agreements within several weeks to

several months after license negotiations have been initiated.

#### **What are typical licensing terms for APL's license agreements with start-ups?**

OTT has executed numerous license and option agreements with start-ups. These agreements have both financial and nonfinancial terms that vary based on the particular set of facts associated with each technology and potential licensee. For example, the stage of development of the technology, the field of use applicable to the licensee, and commercialization risks are all taken into consideration.

Typical terms include:

- **Annual or minimum fees, milestone payments, and royalties on net sales.** Exclusive licensees are generally expected to pay patent expenses. Financial terms may also include a minority share of equity in the start-up if it makes sense for both parties.
- **Field-of-use restrictions** since a start-up often does not have the resources to develop all of the applications of a technology.
- **Reservation of rights** for APL to continue using the technology for its internal research and development purposes and for the benefit of the U.S. government.
- **Diligence terms** to ensure reasonable progress in growing

the start-up and commercializing the technology.

OTT's goal is to negotiate an agreement that is fair and reasonable based on its experience, the relevant industry, and how the APL technology fits into the start-up's ultimate product or service. Additionally, APL seeks to maintain an arms-length relationship in all of its business transactions.

#### **Does APL take a seat on the board of the start-up?**

No, nor does APL take an active role in managing the start-up.

#### **Will APL assign ownership of IP to a start-up (or existing company)?**

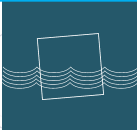
No, APL does not assign or transfer ownership of IP.

#### **What happens if there is follow-on IP to the originally licensed APL IP?**

It depends on who owns the follow-on IP, which may be specified in the license agreement. In general, follow-on IP developed solely by the licensee without APL's involvement will usually belong to the licensee. Follow-on IP developed solely by APL will be owned by JHU/APL, and the licensing of the follow-on IP will be handled by OTT. Typically, the existing licensee will not be automatically granted a license to follow-on IP owned by JHU/APL.

Additionally, during the effective period of an Archimedes Award, the





Archimedes Awardee is not required to disclose the creation of IP unless: (1) the IP is funded in whole or in part by APL or a sponsor of APL; (2) the IP involves the use of APL facilities, personnel other than the Archimedes Awardee, equipment, or materials; or (3) disclosure is required under any separate agreement between APL and the Archimedes Awardee.

***Does the legal structure of a start-up affect its ability to obtain a license for APL IP?***

To be eligible for a license, a start-up should be officially formed and registered according to any applicable government regulations. This could be in the form of a corporation, limited liability company (LLC), or other formal structure. However, APL will generally only accept equity (e.g., in lieu of cash) in a start-up as compensation for a license if the start-up has a structure that allows for the issuance of stock (e.g., a corporation).

***If a start-up needs IP from another institution besides APL, will a separate license be needed?***

Yes, under most circumstances the start-up will need to negotiate separately with the other institution for a license to its IP. The start-up should consider conducting a freedom-to-operate analysis as part of its business plan to ensure it has a viable path to acquire or license any third-party IP rights that are neces-

sary for making or selling its planned products or services.

***If the APL IP is unpatented, will the start-up still need a license?***

The APL IP may be protected by other forms of IP protection, such as copyright and trade secret protection. As a result, a license may still be required for unpatented APL IP. For software that has been released as open-source software (OSS), the start-up may only need to comply with the terms of any applicable OSS license under which the software was released. In that scenario, the start-up would not need to negotiate a separate license with APL for use of the OSS.



# CONFLICT OF INTEREST POLICIES



## *What is APL's policy on personal conflicts of interest (PCOIs) with regard to outside activities?*

APL enjoys significant benefits due to its status as a UARC. To maintain this status, APL and all APL staff members must conduct business with a high degree of objectivity, integrity, and trust by avoiding any actual or potential PCOI. Each staff member's actions can affect APL as a whole, and any unmitigated actual or potential PCOI could constitute a breach of contract or disqualify APL from performing work for our sponsors.

APL staff members may work with outside companies within the scope of their employment at APL through certain approved mechanisms whereby the staff members are provided with a budget and an APL charge number:

- Tech transfer grant – the staff member works as an APL employee with budget provided by OTT
- Tech transition funding – the staff member works as an APL employee with budget paid by the licensee as part of license fees
- APL contract – the staff member works as an APL employee with budget paid by the licensee through a formal work-for-industry (WFI) contract with APL

A formal PCOI evaluation is required for all other cases in which APL staff members wish to work with outside

companies. PCOIs are evaluated on a case-by-case basis by APL's PECO in accordance with G&P #001-0029, Outside Activities and Financial Interests ([https://ecm.jhuapl.edu/sites/GP/Docs/Outside\\_Activities\\_and\\_Financial\\_Interests.docx](https://ecm.jhuapl.edu/sites/GP/Docs/Outside_Activities_and_Financial_Interests.docx)).

Staff members must obtain prior supervisory approval of all outside employment or other outside activities that may present even the appearance of a COI. In general, outside activities must not interfere or conflict with a staff member's role and responsibilities at APL. Additionally, a PCOI can occur if a staff member performs work for another organization (with or without pay) that would call into question the staff member's or APL's objectivity.

Involvement by APL staff members in any outside activity that presents an actual or potential PCOI that cannot be mitigated, including the activities of corporations, companies, sole proprietorships, nonprofit organizations, defense contractors, or labor organizations that are directly or indirectly involved with APL, will not be permitted. In particular, APL staff members may not be employed by companies that have signed or are negotiating technology transfer agreements with APL without prior clearance from the PECO. APL staff members must not participate in the activity or enter into any agreements until final approval is obtained from the PECO.

## *Can I participate in a start-up while maintaining APL employment?*

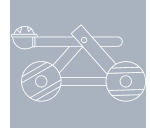
Archimedes Awardees under AeSAP are permitted to participate in their start-ups while maintaining employment at APL (under a professional leave of absence). Additionally, Archimedes Awardees are permitted to negotiate and execute license or other technology transfer agreements with OTT on behalf of their start-ups while employed by APL.

For staff members who are not Archimedes Awardees, participation in start-ups may raise PCOIs, which are evaluated on a case-by-case basis by APL's PECO in accordance with the Laboratory's policies, including G&P #001-0029, Outside Activities and Financial Interests ([https://ecm.jhuapl.edu/sites/GP/Docs/Outside\\_Activities\\_and\\_Financial\\_Interests.docx](https://ecm.jhuapl.edu/sites/GP/Docs/Outside_Activities_and_Financial_Interests.docx)).





# RESOURCES FOR START-UPS



OTT staff members are available to assist you in accessing a number of local and regional resources that can provide meaningful assistance for your start-up.

## JHTV resources

JHU offers several resources for APL staff members interested in launching a start-up based on IP that is owned by JHU through APL. These resources are managed by JHTV (<https://ventures.jhu.edu/>), which is the IP administration center of JHU.

- **FastForward:** <https://ventures.jhu.edu/fastforward/>

FastForward, a division of JHTV, represents a coordinated suite of resources designed to assist start-ups with efficiently moving technologies to the marketplace. FastForward is prepared to screen technologies for start-up venture potential and, when appropriate, to facilitate the development of a commercialization plan for advancing the venture. FastForward also helps entrepreneurs navigate legal, market, operational, funding, talent, strategic, and other hurdles all the way from company formation to advanced venture capital deal-making. In addition to these offerings, FastForward has a mentor-in-residence program that provides entrepreneurs advice and connections to funding sources. One of

the most visible parts of FastForward is its Baltimore innovation hubs, which provide affordable, flexible coworking, office, and lab space for start-up companies at both the Homewood and East Baltimore campuses.

- **Mentors-in-Residence:** <https://ventures.jhu.edu/mentors-in-residence/>

Each FastForward member is paired with one or more mentors who have successfully built, sold, and invested in start-up companies. These mentors-in-residence operate under nondisclosure agreements and share their business and technical expertise with FastForward start-ups.

- **Social Innovation Lab (SIL):** <https://ventures.jhu.edu/programs-services/social-innovation-lab/>

SIL supports innovative non-profits, mission-driven companies, and disruptive technologies that aim to create change and opportunity in Baltimore and beyond. SIL provides social entrepreneurs the funding, mentorship, office space, and workshops they need to develop into thriving, sustainable ventures that make a measurable impact.

## Maryland resources

TEDCO provides resources and connections that early-stage technology and life sciences companies need to thrive in Maryland. Their mission is to enhance economic development growth through the fostering of an inclusive entrepreneurial and innovation ecosystem.

- **TEDCO funding programs:** <https://www.tedcomd.com/funding>

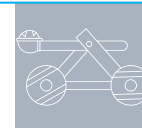
TEDCO funding programs include the Pre-seed Builder Fund, the Seed Fund, and the Maryland Venture Fund. TEDCO's website includes instructions for applying for these funding programs.

- **TEDCO online resources:** <https://www.tedcomd.com/onlineresources>

TEDCO provides a number of links to many educational and other resources available online.

- **TEDCO entrepreneurial resources:** <https://www.tedcomd.com/gateway-services/entrepreneurial-resources>

A site outlining entrepreneurial resources provided as part of TEDCO's Gateway Services program.



### Other resources in Maryland

- **Startup Maryland:** <https://startupmd.org/>

Startup Maryland is a peer-driven, high-growth, and tech venture-focused initiative leveraging ecosystem building for economic development. It strives to connect innovation communities, entrepreneurs, ecosystem builders, investors, and great ventures.

- **Accelerate Baltimore:** <http://www.acceleratebaltimore.com>

Accelerate Baltimore is an initiative of the Emerging Technology Centers (ETC), Baltimore's award-winning incubator, and The Abell Foundation. Its goal is to close the gap between innovative ideas and getting to market by providing seed capital, resources, mentors, potential partners, and a collaborative community.

- **Baltimore Angels:** <http://baltimoreangels.com/>

Baltimore Angels seeks to invest profitably in the regional entrepreneurial ecosystem and advance early-stage innovators to the next stage of capital formation. In the About Us section, the website provides a Company Investment Information form that can be used to apply for early-stage funding as well as a listing of investing members.

### Howard County resources

The Howard County Economic Development Authority (HCEDA) offers several resources to assist Howard County-based start-ups.

- **Howard County Innovation Center:** <http://www.hceda.org/innovation-startups/howard-county-innovation-center/>

The Howard County Innovation Center provides in-house expertise with established technology and business leadership resources. The Center serves the Baltimore-Washington corridor community and beyond. With a roster of world-class entrepreneurs and partners, the Center can assist entrepreneurs with the mentorship and connections needed to move to the next level.

- **Maryland Center for Entrepreneurship (MCE):** <http://www.hceda.org/innovation-startups/mce/>

MCE offers a business resource center to support businesses of all types across Howard County. Included in this center are the Small Business Development Center (SBDC) as well as SCORE mentors.

- **Business Resource Center:** <http://www.hceda.org/innovation-startups/resources/>

Nontechnical, services-based companies, or businesses that

are too early stage for the incubator, can still get support and assistance through the MCE's Business Resource Center.

- **Business Plans:** <http://www.hceda.org/innovation-startups/resources-2/>

This resource can provide assistance with business planning.

- **Start-Up Assistance:** <http://www.hceda.org/innovation-startups/business-assistance/>

Through its Small Business Development Center (SBDC) representative, HCEDA provides technical assistance and business development counseling for new entrepreneurs.

- **Howard Tech Council (HTC):** <http://www.hceda.org/who-we-are/howard-tech-council/>

The HTC strives to be the epicenter of the local tech community. The active and engaged membership base spans a variety of industries and can provide access to a diverse collection of organizations providing mentorship, networking, and connections, as well as potential investors and customers. In addition, the MCE hosts valuable business development workshops and provides incubator space through the HTC.

## REFERENCES

<sup>1</sup> Erin Griffith, “Why Startups Fail, According to Their Founders,” *Fortune*, September 25, 2014, <https://fortune.com/2014/09/25/why-startups-fail-according-to-their-founders/>.

<sup>2</sup> Eric Ries, *The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses* (New York: Crown Business, 2011).

<sup>3</sup> Steve Blank, “Why the Lean Start-Up Changes Everything,” *Harvard*

*Business Review*, May 2013, <https://hbr.org/2013/05/why-the-lean-start-up-changes-everything>.

<sup>4</sup> Stanford University, “Stanford University Office of Technology Licensing Start-Up Guide,” updated March 2016, <https://otl.sites.stanford.edu/sites/g/files/sbiybj10286/f/otlstartupguide.pdf>.

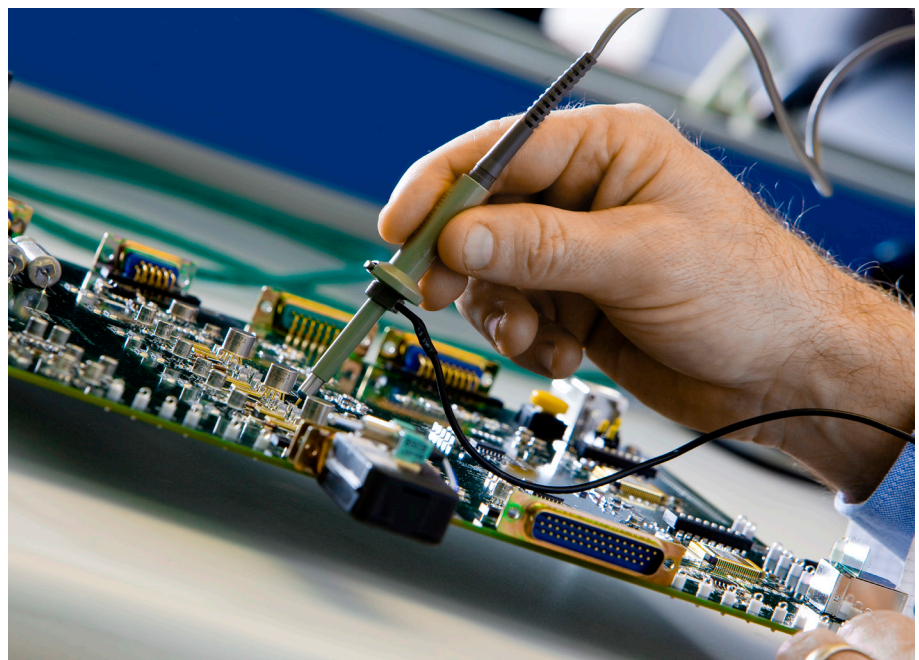
<sup>5</sup> Anna Vital, “How Startup Valuation Works: A Way to Measure a Company’s Potential,” *Funders and Founders*,

July 1, 2013, <https://blog.adioma.com/how-startup-valuation-works-infographic/>.

<sup>6</sup> Geoffrey James, “The 7 Real Reasons Startups Fail (and What to Do Instead),” *Inc.*, November 2019, <https://www.inc.com/geoffrey-james/the-7-real-reasons-startups-fail-and-what-to-do-instead.html>.

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