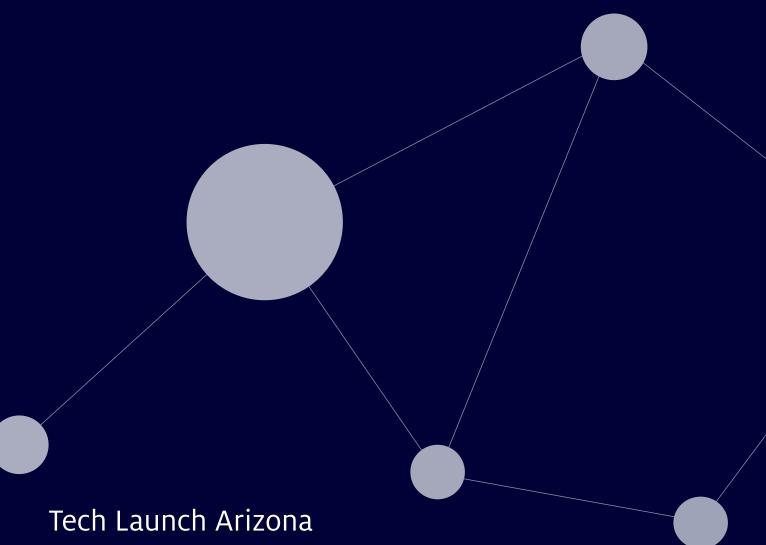


CREATING AND CONNECTING

An Ecosystem of University
Invention and Commercialization



Bringing the inventions of the University of Arizona from the lab to the world

2015 ANNUAL REPORT AND ROADMAP UPDATE

IMPACT IS ONLY THE BEGINNING



Established in 1885, the University of Arizona, the state's super landgrant university, is a global leader and ranked 16 for the employability of its graduates. The UA is a research powerhouse, bringing more than \$625 million in research investment each year, and ranking 19 among all public universities. We are advancing the frontiers of interdisciplinary scholarship and entrepreneurial partnerships, and are a member of the Association of American of Universities, the 62 leading public and private research universities.

Tech Launch Arizona (TLA) is advancing the ways researchers and students at the University of Arizona impact Arizona and our world by translating their discoveries into tangible solutions to the grand challenges of the twenty-first century. By leveraging the UA's emerging excellence in technology transfer, commercial feasibility studies, corporate relations, and tech parks, TLA has produced an ecosystem that encourages partnerships across industries and communities, propels cycles of innovation, and actively supports entrepreneurs as they bring new products to market.

A recent example of this ecosystem in action is SinfoníaRx. A medication management company that employs software developed at the UA College of Pharmacy, SinfoníaRx recently signed an agreement with Walmart to implement the technology in its pharmacies and monitor prescription use for approximately 300 health plans that represent more than six million patients across the U.S.

Such impact is only the beginning. As the UA continues discovering new ways to enrich lives and improve prospects for the people of Southern Arizona and the world, TLA is helping to build Southern Arizona into a center of economic prosperity and high-tech career development. By drawing upon the remarkable research enterprise at the UA, TLA will continue supporting the inventors and entrepreneurs whose discoveries promise to transform science fiction into science fact.

Ann Weaver Hart, Ph.D., President The University of Arizona





In 2015 at the University of Arizona, researchers reported over 200 inventions to Tech Launch Arizona, including a drug that shows promise in helping relieve some of the involuntary muscle movements of Parkinson's disease, an enhanced MRI technology that provides more accurate images in less time, and a new social media platform that allows people to share video clips and blend them into mini documentaries.

These ideas and hundreds of others being developed here have the potential to positively affect people's lives. Even though great scientific ideas add to the body of knowledge and represent thousands of highly educated and trained students moving into the workforce, if they are never brought to market, they remain just that: great scientific ideas. To move from potential to impact, we borrowed from best-in-class university practices, re-engineered our processes and procedures, and created organizational innovations that replicate the success of some of the world's most productive innovation ecosystems at university and regional levels.

Today, we share commonalities with many of the top research universities in the country. What is evolving in Tucson and Phoenix has many of the antecedents that have led to high-tech employEstablished in 2012, Tech Launch Arizona creates social and economic impact through bringing the inventions of the UA from the lab to the world. We build connections between the talents of our faculty and researchers and the experience of entrepreneurs and investors. We cultivate these conversations, fostering ideas that start in the lab, and grow them into new products and thriving businesses that benefit society.

ment and wealth creation in the country's most active innovation hubs. For example, this year, following a rigorous TLA-led self-study and application process, the Association of Public and Land-grant Universities recognized the UA as an Innovation and Economic Prosperity University.

Over the past two years, we have been building an infrastructure at TLA to bridge the gap between such ideas and the people and resources needed to bring them to the world. To do that, we are **creating and connecting** the dots to build an ecosystem of invention and commercialization.

Visualize the dots representing all the individual elements that comprise the ecosystem: people; companies; capital; capacity; capability; facilities; events; and other aspects of technology-based commerce. Just considering people, we work with: UA researchers and students across virtually all disciplines; university administrators and professional staff; patent and business attorneys; experienced business people and technologists who comprise our domain expert advisory network, many of whom are UA alumni;

entrepreneurs and innovative companies that adopt new technologies; and organizations and governmental agencies that support universities and technology-led economic development.

In spanning the boundaries between the University and the technology business world, we are creating meaningful connections between these points. Across the UA, we are seeing a cultural shift in support of commercialization due to our workshops, our seminars, our reputation for service to inventors, and our "can do" attitude. We have successfully collaborated campus-wide to update the promotion and tenure policy and the intellectual property policy to support entrepreneurial activities.

We are creating and connecting new and existing parts of the business community. For example, our SBIR/STTR Tech House and Commercialization Partners programs bring stakeholders from outside the University to the table to help move technologies out of the UA and into the market. At Tech Parks Arizona we have initiated company recruitment programs that reach across our nation's boundaries to companies that want

to serve North American markets and access the talent of the University of Arizona. We are maximizing the social and economic impact of the ecosystem to create new opportunities, new companies, new jobs, and new levels of engagement and collaboration.

As a result, we are achieving neverbefore-seen levels of activity in commercialization at the UA and across the ecosystem through constant adaptation at TLA. In part, the success is due to the hard work and focus of the TLA team. But it is also due to all of the elements of the ecosystem leaning in and engaging with us.

As you peruse this annual report and revision to our Roadmap, keep the connecting-the-dots analogy in mind. You should get a sense of all the connections necessary to make UA commercialization work at a world-class level.

Thank you for being connected with us. We look forward to continuing to work with you to build and strengthen our ecosystem.

David N. Allen, Ph.D. Vice President



PROCESS & SUCCESS

WHAT WE IMAGINED

In 2013, we created a vision for what we thought was possible with a clear mission and UA unit like Tech Launch Arizona to generate and connect the ideas and resources to bring it together. We imagined this scenario in our original Roadmap:

Environmental researchers working to detect water contamination collaborate with an optics professor to develop a bench-top instrument that prepares and analyzes samples in one-tenth the time, and at half the cost of the conventional approach. They bring the invention to TLA and the UA files a patent application. The researchers work with an engineering colleague and an industry business advisor to devise specifications for a hand-held device. TLA funds prototype development and analysis to validate performance. The advisor decides to help lead a startup company to commercialize the invention. UA students are brought in to help analyze the business opportunity and contribute to developing the business plan. The new business gets help launching their company and space to start operations at the Arizona Center for Innovation. A year later, the company is up and running, and is starting to create jobs, pay taxes, and pay royalties back to the UA.

WHAT WE HAVE ACHIEVED

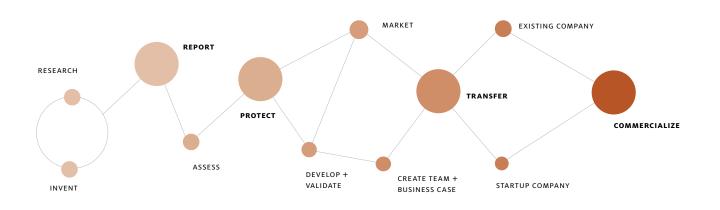
Today, the vision is being realized, and what we imagined is happening every day at the University of Arizona. Here is just one illustrative example of what we have achieved:

A team of researchers from the UA and ASU have been collaborating on a Campylobacter food safety vaccine to reduce bacteria colonization and incidence of resulting human disease. They brought their invention to TLA Licensing Manager Tod McCauley, who helped them disclose the invention and file a patent with help from expert external counsel. At the same time, TLA called upon its domain expert network to help find the best pathway to market for the technology. Proof-of-Concept funding was leveraged to develop the invention. One network member, UA alumnus, Eller MBA and TLA Executive-in-Residence John Buttery, was recruited to lead the startup company as its CEO, in partnership with the co-inventors. Today, the company—called Anivax—has filed for USDA approval for its initial Campylobacter vaccine and has two other vaccines in their pipeline.

OPPOSITE: The world-class work being done at the UA's Richard F. Caris Mirror Lab—which has revolutionized the production of mirrors for the world's largest telescopes—traces back to a 1980 experiment done by Roger Angel, Ph.D., Regents' Professor of Astronomy and Optical Sciences.



With the original TLA Roadmap and then again in last year's annual report, we presented an overview of the university ecosystem of invention and commercialization. That view continues to evolve: we remain guided by our vision of becoming a national leader in university technology commercialization, and delivering on the promise of creating social and economic impact. Over the past year, we have refined our processes, and brought more effective, focused and varied resources to bear on each case we touch. We continue to hone our skills every day, across every point and pathway of the process.



FROM RESEARCH TO IMPACT

TLA's unified methodology for commercializing inventions emanating from UA research

RESEARCH & INVENT

As scientific research proceeds, it may—by intention or by happenstance—give rise to novel inventions. At any time, researchers can approach TLA to discuss their results and inventions. When they are ready, an invention is officially reported.

REPORT

Working with a TLA Licensing Manager, the inventor(s) file an Invention Disclosure that formally reports the invention to TLA and kicks off the process of evaluating the existing patent land-scape and potential market for the invention.

EMBEDDED LICENSING MANAGERS

We have a team of experts embedded within the UA colleges most active in creating cutting-edge technologies. Each Licensing Manager works alongside faculty every day, helping them to identify inventions with potential market value and take them through the process of bringing their inventions from disclosure to license.

ASSESS

Once an invention report is filed, the TLA team works on assessing the patentability and potential market for the invention. Licensing Managers, Business Intelligence and TLA Student Fellows perform this initial assessment, which is then shared and discussed with the inventor(s) and TLA's Commercialization Partners.

COMMERCIALIZATION PARTNERS

Commercialization Partners help by serving TLA and UA startups as Entrepreneurs-in-Residence, Executives-in-Residence and Investors-in-Residence. As of the publication of this report, we have 14 professionals actively engaged with UA startups.

BUSINESS INTELLIGENCE UNIT

Although many intellectual property (IP) disclosures come to us well-supported by market research, we work on those that do not yet have such information to back up a patent and commercialization strategy. In 2015 we optimized our Business Intelligence function to provide early insight into the market for technologies in our pipeline, and to continue refining market analysis as other resources and people are brought into the case.

STUDENT FELLOWS

We have a team of student TLA Fellows who work both individually and in groups with Licensing Managers to assess the potential of newly disclosed technologies.

IN THE NEWS: Tech Launch Arizona Commercialization Partners Take On UA Startups

What are the ingredients for a successful university startup? When starting a new company like those based on research at the University of Arizona, TLA understands that startups require a number of unique elements for success, such as great marketable ideas and great leadership.

DEC 2014, HTTP://BIT.LY/TLA2015-COMMPARTNERS

INVENT

PROTECT

Once the novelty and originality of the invention are determined, TLA and the inventor(s) work with a network of patent lawyers around the nation to protect the invention, usually through filing a provisional patent application.

IN FY 2015, we filed 97 provisional patents and put greater resources into crafting better, stronger applications than in years prior to TLA. As with FY 2014, 100% of our FY 2015 patent prosecution work was performed by outside counsel, ensuring the highest quality work done on behalf of the UA and its inventors.

IN FY 2015, we converted 62 provisional patents to utility patents.

MARKET

If the value proposition for the newly protected invention is apparent and appropriate for existing companies, it is marketed to those companies whose offerings may be enhanced through adding such an invention to their existing products and/or services. Sometimes, this potential licensee is already known based on prior relationships. Other times, TLA conducts market research to identify potential licensees.

TECHNOLOGY MARKETING

We have a Technology Marketing Associate on our team who, working with TLA licensing managers, develops and executes strategic marketing plans to connect UA technologies with potential licensees.

DOMAIN EXPERT ADVISORY NETWORK

In 2013, in partnership with the City of Tucson and AZTERA, we began creating a network of volunteer domain experts with experience in technology-related fields, and/or who are experienced entrepreneurs. We bring these talented minds to the table on a case-by-case basis to help us understand the potential for new UA technologies, and help develop go-to-market strategies. As of May 2015, our network stands at over 1,300 members—900 of whom are UA alumni—and it continues to grow.

ASSESS

MARKET

DEVELOP + VALIDATE

Many inventions we receive are either not ready for market or it becomes apparent that additional work can boost the adoption value. Many approaches can be undertaken to refine the market proposition, from additional research on prospective customer needs to validation of the market proposition through prototype development or laboratory development work.

If this process determines that the product's best path is a license to an existing company, potential licensees are identified and the IP is actively marketed.

TECHNOLOGY ASSET DEMONSTRATION

Since the inception of TLA, we have spent over \$1.5 million to help UA investigators with inventions that needed further development—what we used to call Proof-of-Concept funding. Our approach is to identify an important incomplete element of the technology that relates to how it would be productized. Projects funded included prototyping, commercial valuation and validation, coding completion and scalability studies.

IN THE NEWS: TLA, University Libraries Partner to Support Commercialization of UA Inventions

Tech Launch Arizona has teamed up with University Libraries to create a Business Intelligence Unit, dedicated to gathering information to help researchers and faculty members make smart, well-informed business decisions as they bring inventions to the marketplace.

MAY 2014, HTTP://BIT.LY/TLA2015-BUSINESSINTEL

CREATE TEAM & BUSINESS CASE

If the process determines that the invention represents a solid foundation for a startup company, TLA works with the inventors and its extensive network to help build a solid leadership team for the new entity. The leadership team then develops a business case describing how and why the new company will achieve success.

STARTUPS

We help cultivate new UA ventures, moving them from budding idea to thriving startup. We do so through helping them understand what they need for success, and then finding the right leadership—often from our Commercialization Partners program—to take them forward.

DEVELOP + VALIDATE

CREATE TEAM + BUSINESS CASE

EXISTING COMPANY

TRANSFER

This is the period of time when TLA licensing managers negotiate and execute the license that transfers the rights in the IP to the licensee. The license contract grants IP rights in exchange for protection, infringement and commercialization obligations and applicable royalties.

In 2015, TLA completed 86 licenses and options in total, which included 45 exclusive and 38 non-exclusive licenses.

DEVELOP

The company builds upon the initial University invention and work to develop initial products for market. If the company is a startup, resources such as continued involvement with TLA and its network of experts, the services of the Arizona Center for Innovation (AzCI) and the resources of Tech Parks Arizona can be leveraged.

ARIZONA CENTER FOR INNOVATION

AzCI fosters University technology startups, and helps emerging and mature companies develop their ideas, inventions and the evolution of product. As TLA's business incubator at the UA Tech Park, AzCI provides the facilities, services and expertise needed to prepare businesses for successful entry into the market.

COMMERCIALIZE

The licensee uses, makes and sells products that are protected by the patent rights granted in the license from the UA.

CATAPULT CORPORATION

The Catapult Corporation, or "Cat Corp," is a 501(c)(3) non-profit corporation—a seed venture capital investment company—designed to provide early-stage capital to the most promising startup companies emerging from UA researchers and students.

Cat Corp offers an innovative philanthropic opportunity unique among universities, and represents a vehicle for philanthropic, entrepreneurial donors to contribute to capitalizing new UA-related ventures. Through Cat Corp, the UA receives the benefit of an interest in new UA-born companies in forms such as convertible debt and stock.

IN THE NEWS: Brown Foundation's \$2.5 Million Challenge Kicks Off Catapult Corporation

In 2014, Tucson's Thomas R. Brown Foundations pledged to match up to \$2.5 million raised to initiate Cat Corp, designed to be a self-sustaining investment corporation. The eventual goal is to grow a \$10 million corpus of endowed funds.

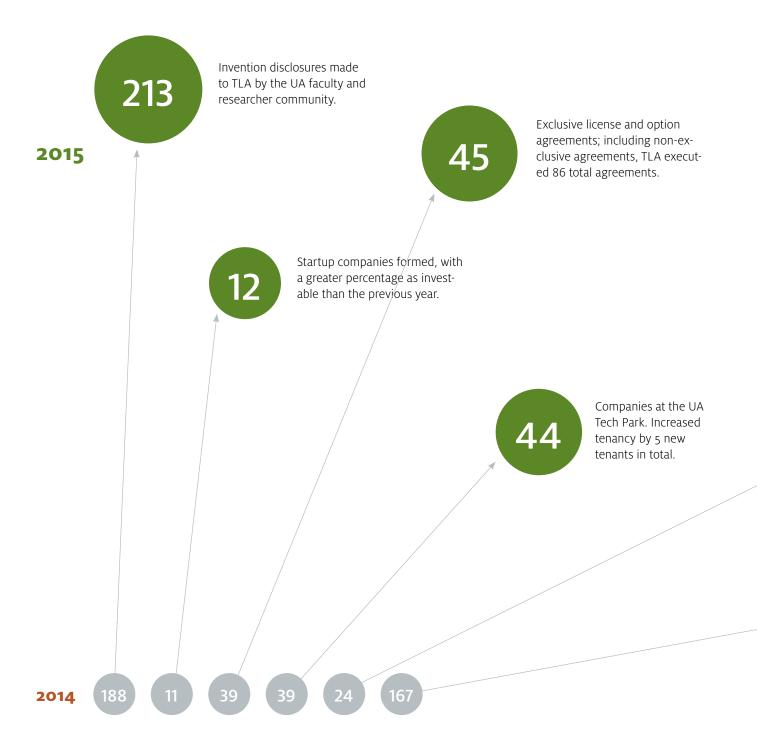
AUG 2014, HTTP://BIT.LY/TLA2015-CATCORP



STARTUP COMPANY



BY THE NUMBERS





In revenue, encompassing \$2.4M from royalties and patent reimbursements for intellectual property, representing a 45 percent increase over last year. Also includes a one-time settlement payment of an additional \$2.3M.



The average wage of a worker at a UA Tech Park tenant was \$91,145—about twice the Pima County average of \$46,363.



Patents issued for technologies invented at the UA.



UA Tech Park and its resident companies have an annual economic impact of \$2.33 billion on Pima County's economy and \$3.12 billion on Arizona's economy.



US patent applications filed.

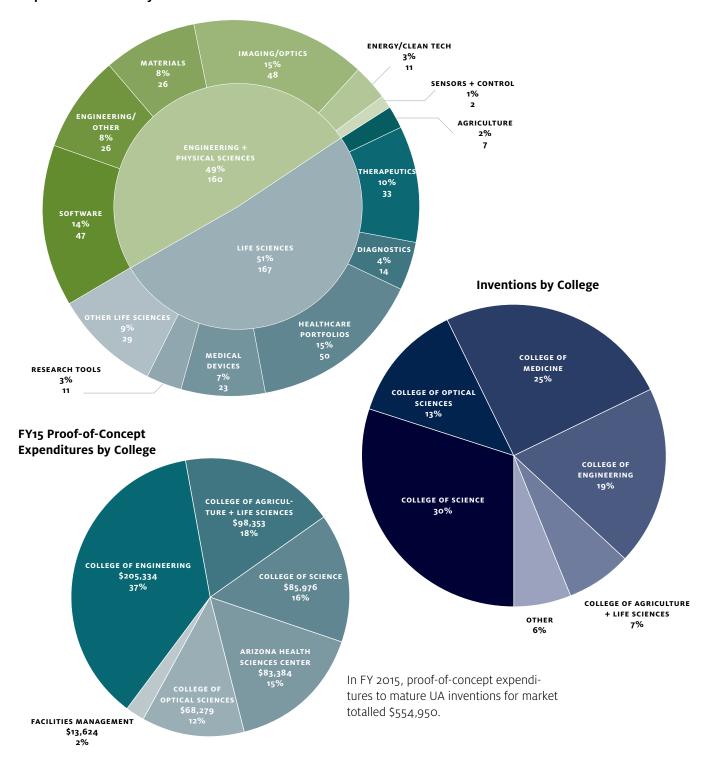


Proof-of-Concept awards made to align inventions with market drivers.

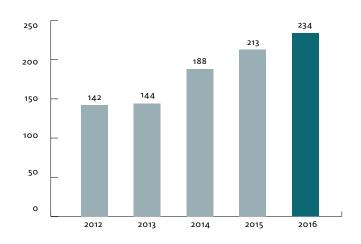


Arizona Center for Innovation helped 16 companies this year, and offered 17 workshops reaching 244 people.

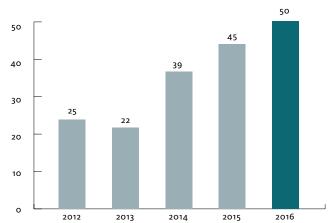
Reported Inventions by Field



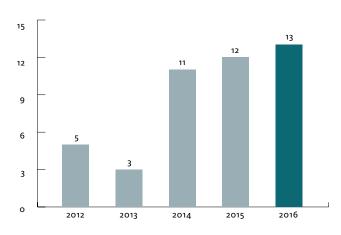
Total Invention Disclosures



Exclusive Licenses and Options



Total Startup Companies



Royalty and Patent Reimbursement Revenue











ANIVAX was started this year to commercialize a revolutionary food safety vaccine developed jointly at the UA and Arizona State University to reduce colonization of Campylobacter bacteria in poultry. The goal is to ultimately lower the incidence of human disease and associated conditions.

www.anivax.com

DATAWARE VENTURES

developed a solution to make databases perform faster. The technology, called microspecialization, was invented in the UA Department of Computer Science by Ph.D. student Rui Zhang and his advisors, computer science professors Saumya Debray and Richard Snodgrass. They worked with both the Business Development Resources Group and the Arizona Center for Innovation to mature their company.

www.datawareventures.com

GLYCOSURF executed an exclusive license agreement this year for a novel chemical synthesis of glycolipids technology. The startup took full advantage of TLA's services, from product development strategy through proof-of-concept funding. GlycoSurf worked on its business strategy with the Arizona Center for Innovation, where it built a reactor vessel to create customer samples.

www.glycosurf.com

METROPIA, a company founded by College of Engineering Associate Professor Yi-Chang Chiu, launched an innovative app that incentivizes commuters to change their driving habits for improved regional traffic, officially hitting the streets of Tucson on March 20, 2015. This local company worked with Tech Launch Arizona and the Arizona Center for Innovation to commercialize its technology.

www.metropia.com



sinfoníarx was launched in 2013 based on a medication therapy management technology developed at the UA College of Pharmacy that proactively monitors prescription medications and identifies problems within a patient's regimen. Following on rapid growth, Sinfoníarx announced in 2015 that Walmart will implement the technology in its pharmacies to improve outcomes for millions of patients.

www.sinfoniarx.com



LOOKING AHEAD

When we set out on this journey two years ago, we were tasked with unifying three University functions—technology transfer, corporate relations, UA Tech Parks, and adding a fourth focused on ecosystem development and new ventures.

In 2014 while simultaneously achieving excellent levels of performance and building our team, we laid out a clear path for that integration. Since then, a clear image of the ecosystem has taken shape.

While we still have much work to do, we are a truly unified organization, working under a singular mission and vision. We're creating and connecting the ecosystem, bringing together the raw materials, a team of generous and committed partners, and our full complement of services and resources to achieve measurable social and economic impact.

TLA is creating and connecting:

We are building on our past and creating our future. TLA's original 2013 Roadmap represents the beginning of our journey. In the two years since, we have expanded our reach, connecting our starting points with the people and resources to extend the social and economic impact of UA research.

As we move into FY 2016, those connections continue to grow, and we are working to meet our goals in support of the University, the Never Settle strategic plan, the citizens of Arizona, and communities that extend beyond our borders.

Our mission remains the same:

TLA will build upon the synergies among the faculty, administration, students and alumni of the University of Arizona, its Tech Parks, and the technology and business community to significantly enhance the impact of UA research, intellectual property, and technological innovation and entrepreneurship.

We are on track to achieve our vision:

By 2020, the University of Arizona through Tech Launch Arizona will become a recognized national resource for its role in commercializing UA-created knowledge, bringing the University's inventions to the public for economic and social benefit, and creating new levels of collaboration between academia and industry.

MORE INFO ONLINE: Read about our progress against each of our FY2014 commitments on our website.

HTTP://BIT.LY/TLA2015-2016ROADMAP



TO DO IN FY 2016:

- Continue to integrate our Business Development Resources, Tech Parks and Technology Transfer operations.
- Continue to grow the IP and license portfolio with 10 percent increases in major performance metrics.
- Increase selectivity for entry into our network of domain experts in order to better cover select UA technologies and create connectivity among its members.
- Grow Commercialization Partners group from 14 to 28 and bring them into case discussions earlier, during reviews of invention disclosures.
- Broaden the scope and objectives of the Asset Validation and Demonstration program (formerly POC program) and initiate 30 grants to faculty.
- Complete the Biomedical University/ Company needs assessment project and create a set of actionable recommendations.

- Implement Salesforce CRM in collaboration with UITS.
- Appropriately advocate for approval of the Pima County Bond package; begin planning and design of the Innovation Building at the UA Tech Park—The Bridges, with the goal of having that project early in the bond sales.
- Select development partners for the UA Tech Park and the new UA Tech Park—The Bridges.
- Issue an RFP and select firms/technologies for Solar Zone Phase Two projects.
- Complete the Cooperation Agreement between the UA and Campus Research Corporation (CRC).
- Complete the Cat Corp Thomas R.
 Brown Foundations challenge match
 (raise an additional \$2.4M) and initiate
 the first round of two to four investments.
- Evaluate the efficacy of the SBIR/STTR

Tech House program.

- Continue to provide "front door" response to inquiries from business about engaging with UA; serve as the point of contact for Sun Corridor to engage UA faculty in understanding technology-related site selection inquiries and assist local economic development agencies with UA coordination.
- Further influence inventor engagement by:
 - » Increasing TLA's offering of IP-oriented seminars by two per semester.
 - » Engaging graduate students in intellectual property creation through programs to increase awareness and knowledge.
 - » Provide outreach to the Phoenix market with two seminars per year; engage audiences through a mix of blogs, videos, bulletins and practice statements.
 - » Deliver TLA's next Annual Report and Roadmap Update by September.

LEADERSHIP AND KEY PARTNERS

Meet the entire TLA team at techlaunch.arizona.edu/staff.



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INVESTOR-IN RESIDENCE

Dennis Merens

AZCI MENTOR-IN-RESIDENCE

Ralph Hershberger

Meet them at http://bit.ly/tla2015-cp-cohort

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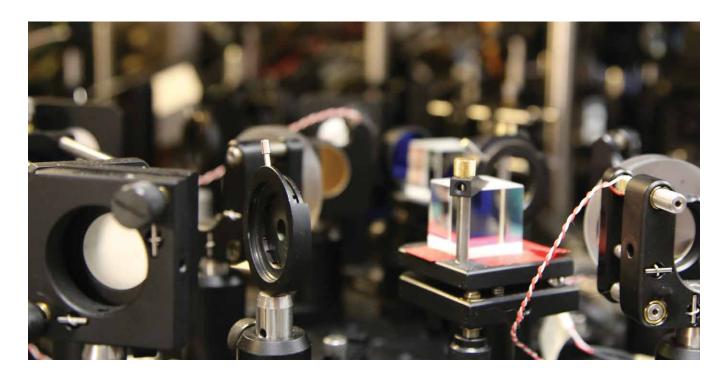
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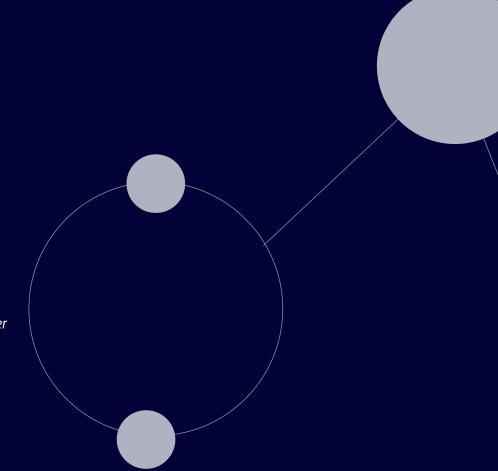
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Jeff Goldberg, Chairman, Dean College of Engineering, Tucson
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