



TECH LAUNCH ARIZONA
ANNUAL REPORT FY2017





WE CREATE

social and economic impact through bringing the inventions of the UA from the lab to the world.

WE CULTIVATE

conversations to refine ideas that start as UA research and grow them into new products and thriving businesses that benefit society.

WE BUILD

connections between the talents of our faculty and researchers and the experience of entrepreneurs and investors.

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David Allen, Ph.D. | Vice President | Tech Launch Arizona

Overall, it has been another great year for TLA. We once again exceeded our performance goals, completing 105 total licenses for UA inventions, and attained a number of high-bar milestone achievements for the UA.

People across the UA community are not only learning and understanding the value of what we do, but they are engaging with us more and more, as evidenced by the 261 invention disclosures we saw this year – more than any other year in UA history. Our incredible faculty appreciate much better how commercialization is the natural extension of research.

UA faculty want their research to make a difference, and we've shown that we have the people, both on staff and through our extensive networks, to help drive such impact.

Through all these connections, we've demonstrated that success comes from the highest attention to quality customer service. We are a capable, mission-driven organization that creates solutions with reasoned risks and produces results that matter. And when we require more mindshare and capacity, we augment our teams through engaging the extended innovation ecosystem.

We are gaining recognition for our contributions and achievements at the local, state and national levels. We are creating great success stories and telling them as widely as possible to increase our reach and help others learn from our accomplishments.

In our original vision for 2020, we stated that we will become a nationally recognized model in our field. That recognition will come through setting and achieving ambitious goals to bring the products of this great university to the world. We will only realize that vision with your continued engagement. Thank you for being a part of our mission.

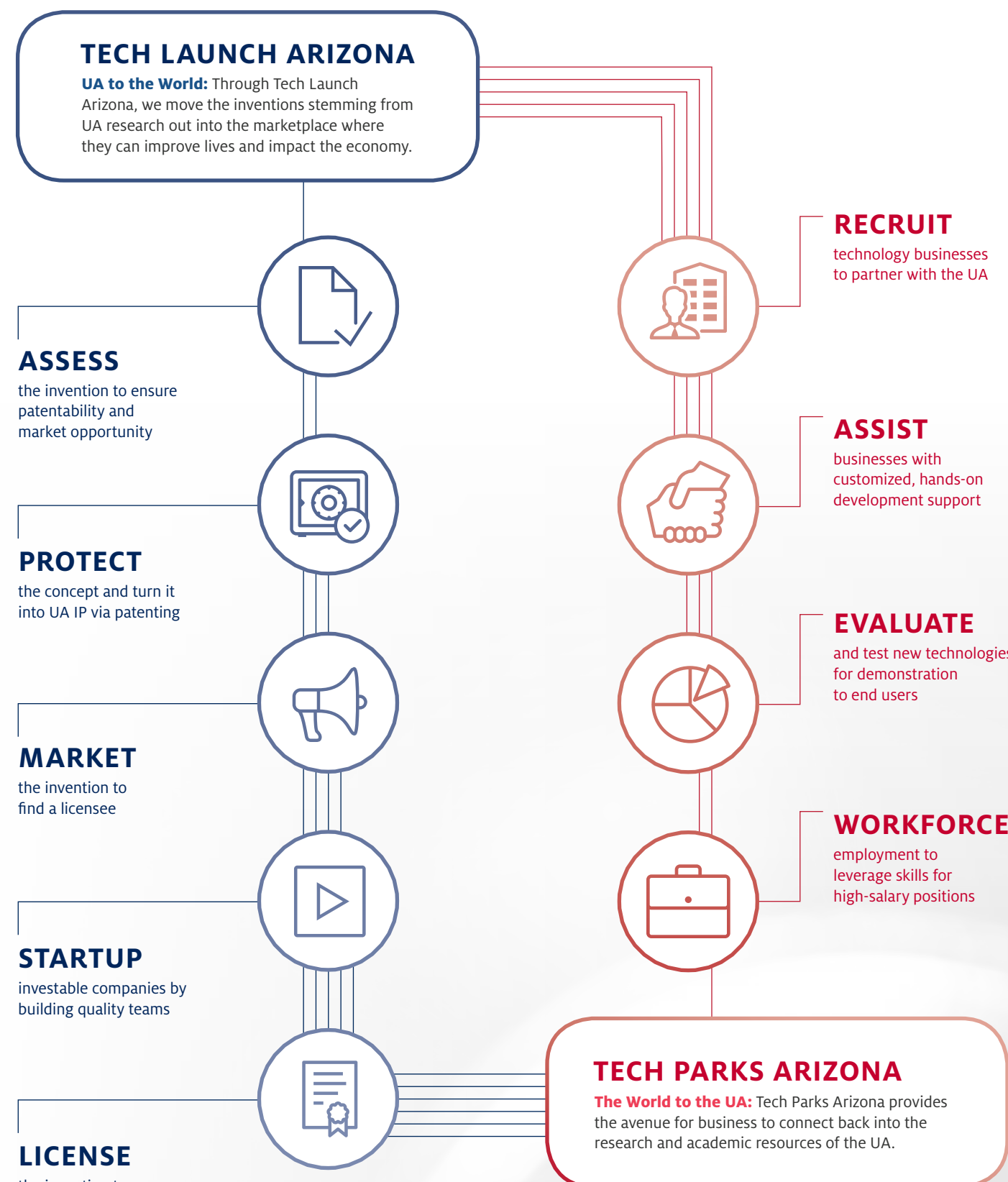
FROM THE PRESIDENT

Tech Launch Arizona's success in 2017 and the past several years is a sign that the University of Arizona is deepening its culture of innovation and a call for all of us to ensure that we realize its potential.

With greater than 80 percent growth in invention disclosures over TLA's first five years, and nearly three times the royalty and patent income this past year as 2013, we have great momentum and great promise for the future. Now, we must build on this success to achieve TLA's vision of being a national leader in technology commercialization—TLA's momentum will not continue on its own. Strong commercialization and technology transfer come from strong scientific discovery and a robust commitment to seeing it benefit the world. All of us who are part of the UA innovation ecosystem—faculty, staff, students, and partners here in Arizona and around the world—need to push our success forward by telling TLA and the University's incredible stories and by working together to encourage more like them.

I came to the UA in part because I was excited to do this work and because I knew that many people here are committed to ensuring the UA's extraordinary promise is realized. As we reach for a new horizon of possibility, I am looking forward to working with many in our ecosystem to expand TLA's reach and impact, and I am grateful for the leadership of David Allen and his team over the past five years. I hope you will join us in forging the continuing success of Tech Launch Arizona.

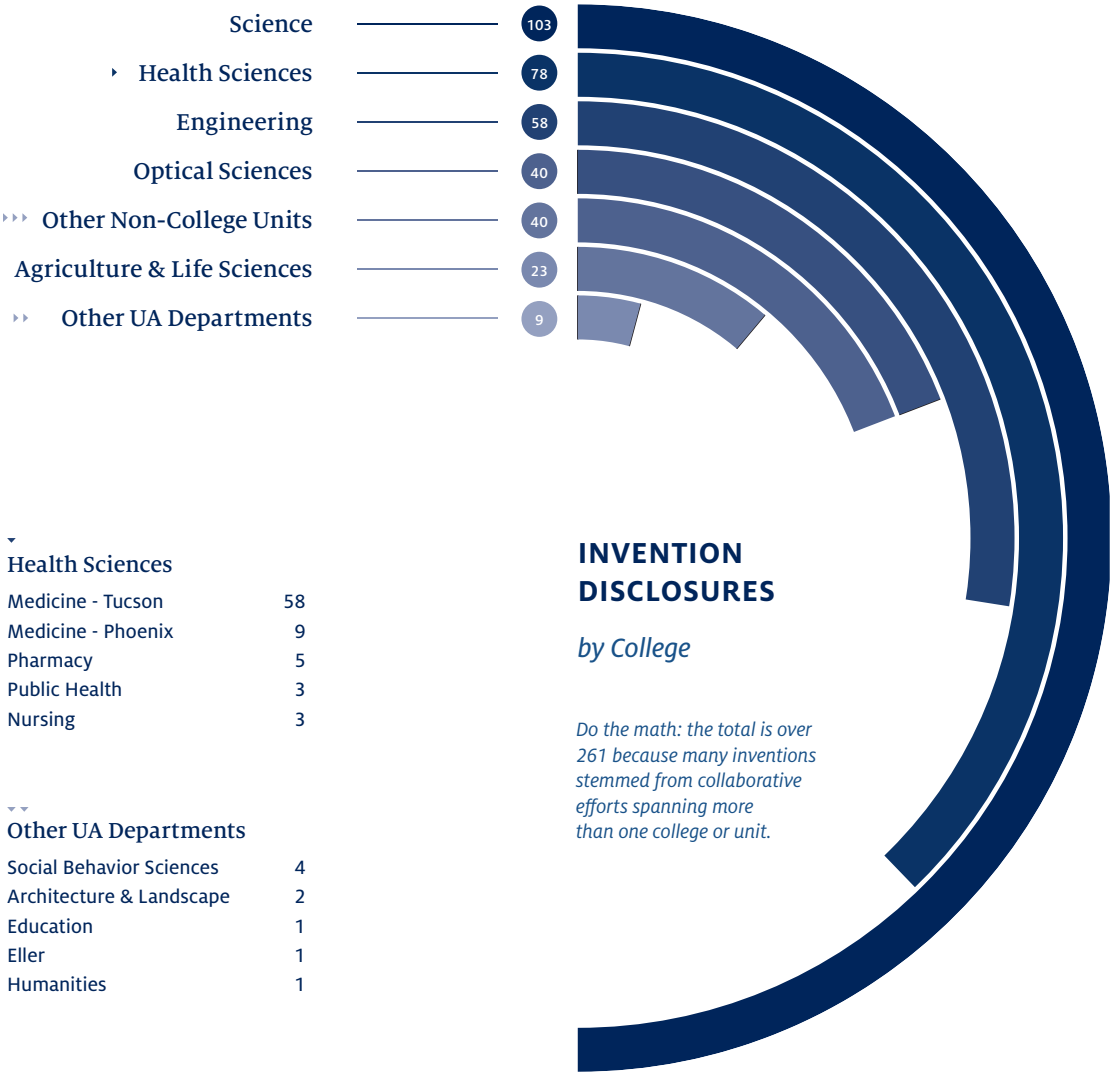
Robert C. Robbins, M.D. | President | The University of Arizona





Flow of Inventions from Across the UA

We receive a steady flow of invention disclosures from across the UA ecosystem. These are the sources of those 261 inventions.



Health Sciences	
Medicine - Tucson	58
Medicine - Phoenix	9
Pharmacy	5
Public Health	3
Nursing	3
Other UA Departments	
Social Behavior Sciences	4
Architecture & Landscape	2
Education	1
Eller	1
Humanities	1

Non-college units that disclosed inventions include the Office of Instruction and Assessment, UA and Arizona Health Sciences Libraries, the Arizona Cancer Center, Arizona Public Media and UA Information Technology

INVENTION DISCLOSURES

by College

Do the math: the total is over 261 because many inventions stemmed from collaborative efforts spanning more than one college or unit.

261
invention disclosures in FY2017

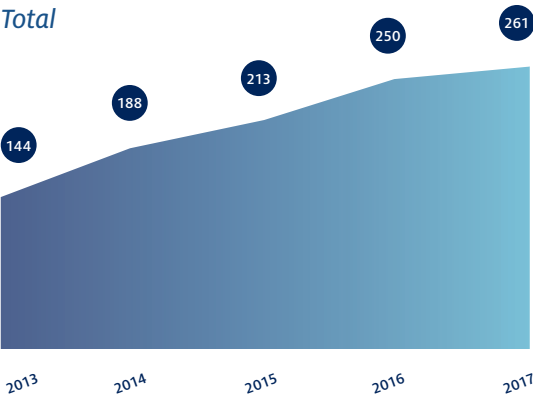
\$3.3M
of income from royalties & patent reimbursements in FY2017

105
licenses & options in FY2017

FY2017
INVENTIONS
AT A GLANCE

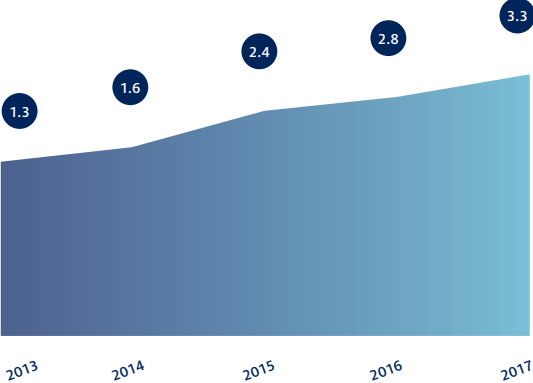
INVENTION DISCLOSURES

Total

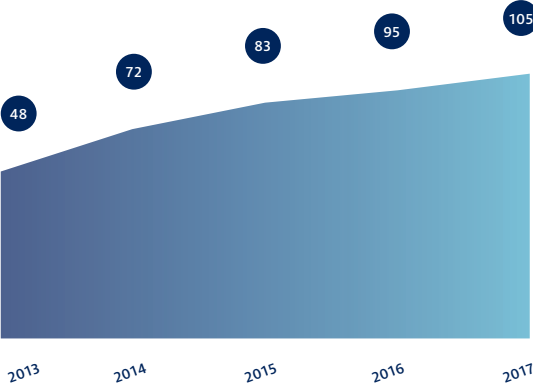


INCOME FROM ROYALTIES & PATENT REIMBURSEMENTS

(in \$ millions)



LICENSES & OPTIONS



Commercialization Network



“ Building effective networks is kind of like putting a band together. Everyone can be a really talented individual, but you have to be able to listen for each person’s strengths and give them the parts that best showcase their talents. ”

—Eric Smith, Commercialization Network Manager, Tech Launch Arizona

COMMERCIALIZATION PARTNERS

- | | | |
|----------------------|----------------|----------------------|
| Ken Auga | Katina Koller | Thomas Neustedter |
| Richard Austin | Ted Kraus | Don Orton |
| Mark Baker | Nicholas Lim | Doug Rasmussen |
| Aaron Call | Patrick Marcus | Alexander G. Schauss |
| Trina Callie-Dixon | Iain McCreary | Jerry Schuster |
| Paul “Mack” Consigny | Aric Meares | Vince Sumpter |
| Brian Ellerman | Dennis Merens | Bill VerDuin |
| Sergio Gazic | Kelvin Ning | Mike Voevodsky |
| Dan Janes | Peter Nestler | John Zipp |



INVOLVING PEOPLE LIKE YOU

Our Commercialization Network is a group of over 1,500 individuals who use their expertise to contribute to conversations around emerging University of Arizona inventions. In 2017, we grew our network both in terms of numbers as well as how we engage our membership.

Of that network, we have engaged 27 as Commercialization Partners, who have expressed a specific interest in increasing their work with TLA. Along with greater involvement with our startup teams, Commercialization Partners also participate in weekly Round Table meetings – both in person and remotely – where we discuss new technologies and their opportunities. Thus far, we have placed 14 highly qualified individuals in leadership positions with UA startups.

+1,500
VOLUNTEERS

MENTORS-IN-RESIDENCE

At the highest level of engagement, we have four Mentors-in-Residence, who are all seasoned technology entrepreneurs with track records of success; they are part-time TLA employees, advising teams and the UA research community, and helping to develop the pathways for these technologies to grow into successful ventures.

Bruce Burgess

30 years’ experience in medical diagnostics, devices and drug delivery, worked with Eli Lilly, Sensor Systems, Inc., Mallinckrodt Medical, HemoCue, Inc. and others.



Steven Wood

25 years of startup and executive experience with companies such as PowerCube Corporation, Unitrode Corporation, Power Convertibles Corporation and others.



Michael Sember

Dedicated to pharmaceutical technologies, 40 years of startup and executive experience working for companies like Marion Merrell Dow, Elan Corporation, Palyon Medical, and others.



Kevin McLaughlin

30 years’ experience in physical sciences and engineering technologies, worked with Motorola, Cray Research, SGI, Cisco Systems and Avid.



Asset Development

FROM INVENTIONS TO ASSETS

In FY2017, TLA budgeted over \$1 million for Asset Development, providing \$466,667 in new awards for 15 projects with the remainder going toward carry-over projects from prior years. These moneys went towards moving early-stage technologies toward market readiness. Awardees came from four different units: Arizona Health Sciences, the College of Engineering, the College of Science and the College of Optical Sciences. Some inventions receiving such funding include:



A terahertz transistor being developed for applications like quantum computing



A new formulation for a non-leaching, photochemically stable sunscreen



Peptide derivatives to improve impaired cognitive function



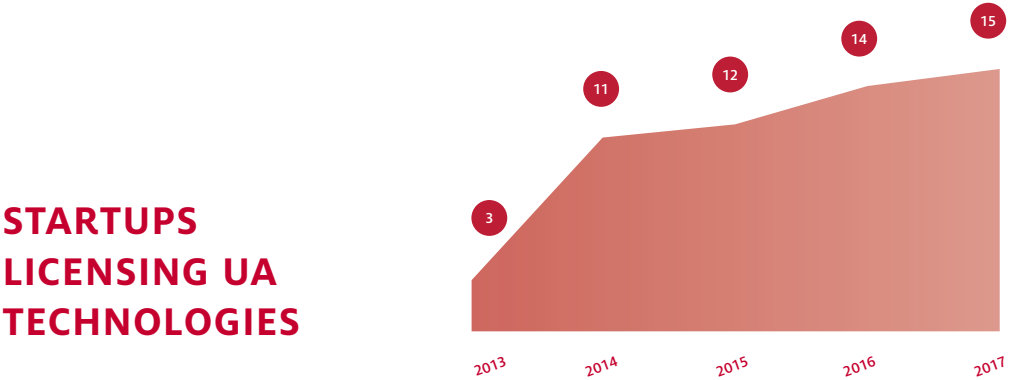
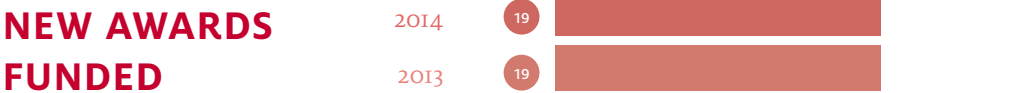
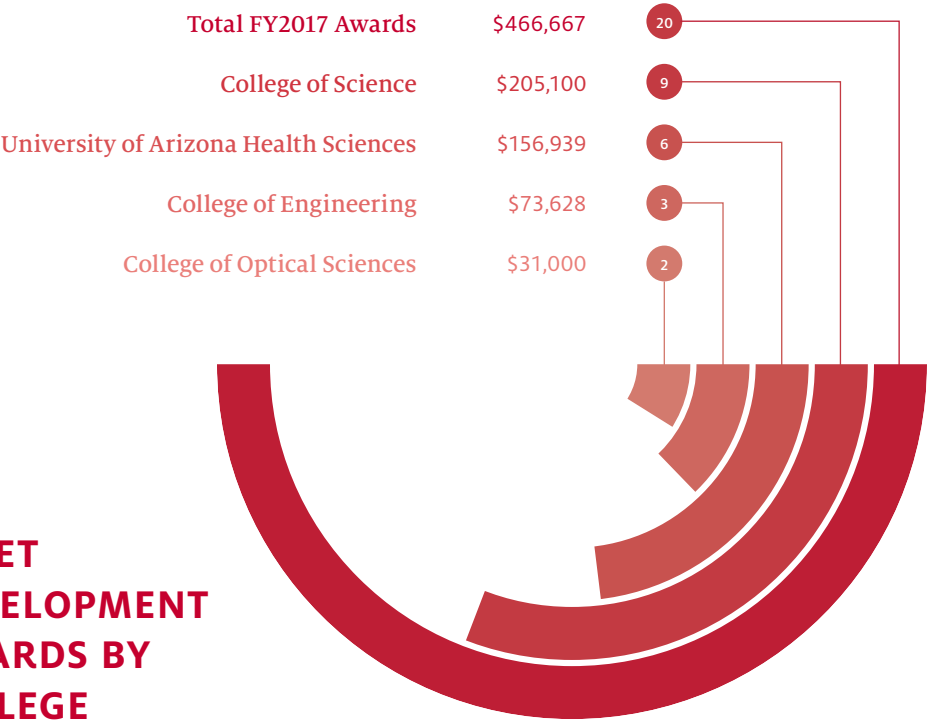
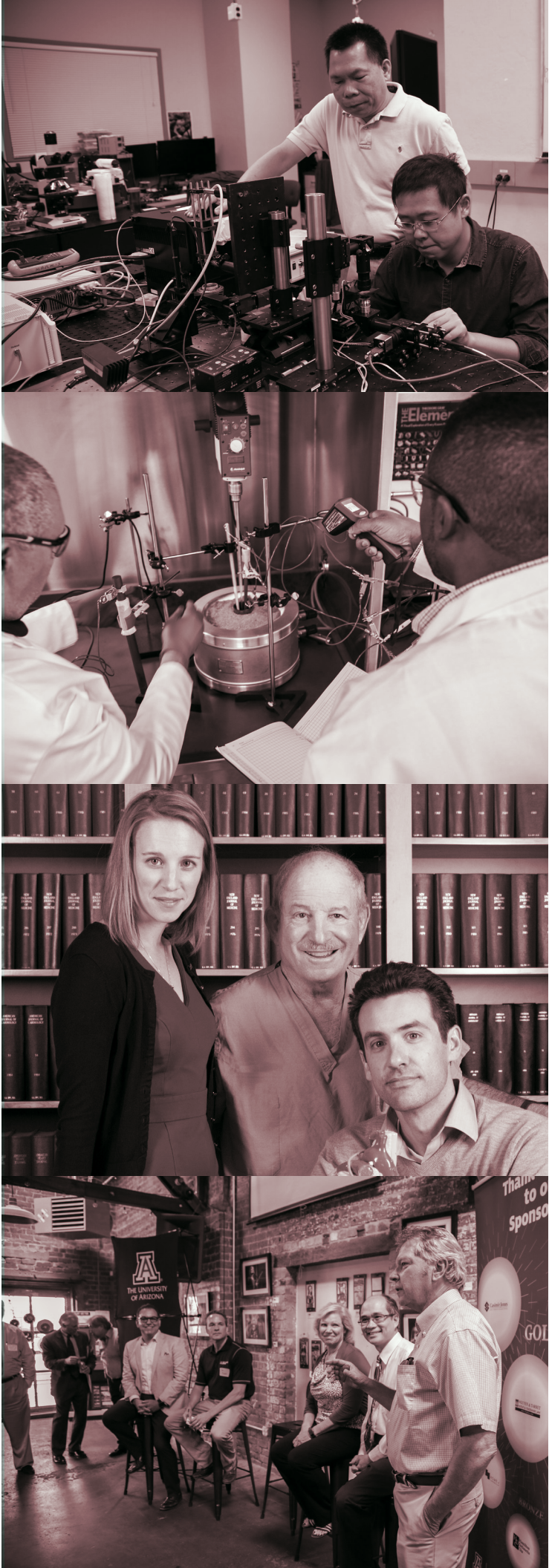
3D printed ultra-high refractive index polymers



New small molecule inhibitors to treat chronic pain



New methods for additive 3-D printing of visible wavelength optics



2017 Startup Cohort

ACRETE PTE

Acrete Pte. Ltd., commercializing a 3-ingredient concrete replacement material using fly ash, invented by Associate Professor of Mining and Geological Engineering Jihnhong Zhang, Ph.D., and graduate student at the time, Qingming Feng.



Avery Therapeutics, Inc., advancing cell-based tissue engineered therapeutics to treat heart failure, invented by Steven Goldman, M.D., of the Sarver Heart Center and Jordan Lancaster, Ph.D.



Catalina Pharma, Inc., developing a TRPV1-inhibitor as treatment for anesthesia-induced hypothermia, invented by Amol Patwardhan, M.D., Ph.D., assistant professor in the Department of Anesthesiology and Pharmacology in the UA College of Medicine - Tucson, and Frank Porreca, Ph.D., associate department head of Pharmacology in the UA Cancer Center.

COHERENT LIGHT SCIENCE

Coherent Light Science, commercializing software for FPGA and ASIC chips, for research in optical network technologies, invented by Stanley Johnson, Ph.D., and Molorad Cvijetic, Ph.D., professor in the UA College of Optical Sciences.



Desert Saber, developing interactive training software applications for the mining industry, created by Leonard Brown and Mary Poulton, Ph.D., former Director of the Lowell Institute for Mineral Resources.



Entemia, bringing to market an ArizonaMED learning management system developed by Senior Applications Systems Analyst/Developer Fermin Martinez Gregoso and Marcus Bates of the College of Medicine - Tucson.



FishTail Technologies licensed a tool to integrate student information systems and learning management systems developed by a team from the UA Office of Instruction and Assessment and University Information Technology. The team includes Adam Brokamp, David Baty, Jayaram Timsina and Alexander Angeles from UAIT, and Mark Felix, Garrett Flora and Mark Bryant from OIA.

HELM TECHNOLOGIES

Helm Technologies, commercializing a UA-invented small animal cage divider invented by Associate Professor and Director of Translational Neurotrauma Research Jonathan Lifshitz, Ph.D., of the UA College of Medicine - Phoenix and Phoenix Children's Hospital Research Laboratory Manager Bret Tallent.



Lum.AI, commercializing natural language processing software that enables the searching of large amounts of data based on causal relationships, invented by Gustav Hahn-Powell, Ph.D. candidate in the Department of Linguistics; Mihai Surdeanu, Associate Professor of Computer Science; and Marco Valenzuela, postdoctoral research associate in the College of Science.



Lunewave, Inc., bringing to market a new radar using a 3D-printed Luneburg lens invented by Hao Xin, Ph.D., professor in the Department of Electrical and Computer Engineering.



Nanosonic Bioreagents, manufacturing reagents with applications in sample preparation for high-throughput DNA sequencing, medical imaging, and clinical therapy in conjunction with chemotherapy and ablation therapy, co-invented by Terry Matsunaga, Pharm.D., Ph.D., of the UA Cancer Center and the College of Medicine - Tucson.

MAGPI

MAGPI, commercializing a multi-channel magnetic phase reconstruction to improve the precision and robustness of MRI images, developed by Joseph Dagher, Ph.D., formerly of Electrical and Computer Engineering, Biomedical Engineering and Medical Imaging.



Palo Verde Networks, Inc., providing fast probing of signal quality in wavelength-division multiplexing (WDM) network technology, invented by Dan Kilper, Ph.D., research professor in the College of Optical Sciences.

TPHOTONICS

TPhotonics, Inc., developing a tunable, pulsed, mid-IR VECSEL laser invented in the College of Optical Sciences by Mahmoud Fallahi, Ph.D., professor of optical sciences; Chris Hessenius, Ph.D., research professor in optical sciences; and Michal Lokowski, postdoc in optical sciences.

VAP MEDIA

VAP Media, offering a variety of media for both educational and entertainment use, developed by Norman Weinberg, professor in the UA Fred Fox School of Music.

15

Startups in
FY2017

SERVING ENTREPRENEURIAL INVENTORS THROUGH NSF I-CORPS

“In the big picture, I-Corps broke down a lot of barriers for us. We thought that moving toward commercialization and building our business was going to be a difficult process and beyond the scope of what we do in our day-to-day, but we came to realize that it's actually part of what we do in general, and that it's just a few extra steps.”

—Bonnie Hurwitz, Ph.D., Assistant Professor, Agricultural and Biosystems Engineering, College of Agriculture and Life Sciences

As an NSF I-Corps Site, TLA offers a program which provides individual project grants up to \$3,000 to help entrepreneurial teams with innovative technologies identify their customers and get to know those prospective customers' priorities. In total, the NSF grant provides TLA with annual funding for three years to distribute to 30 selected I-Corps applicant teams each year. Teams typically consist of an inventor/academic lead, an entrepreneurial lead, and a business mentor. In FY2017, 39 teams went through the program.

50%
of FY2017 UA
startups went
through I-Corps

38
teams participated
in the program
in FY2017

56
teams served
since last
January 2016

Tech Parks Arizona

FY2017 RESULTS

UA TECH PARK AT RITA ROAD

\$1.7B
annual economic impact on regional economy

\$92K
average park employee salary, double Pima County's average

95K
solar panels and 10 energy companies at Solar Zone

2M
square feet of office, lab, and production space

46
resident companies

6K
employees

10%
employment growth for tech companies

ARIZONA CENTER FOR INNOVATION

\$36M
of investment raised

13
new client startups in FY2017

+50%
have a direct UA affiliation

+100
clients served since 2003

GLOBAL ADVANTAGE

5
participating companies

BRIDGING INDUSTRY AND THE UA

FY2017 was another strong year for the Tech Parks, characterized by strong tenant demand. We have aligned our economic development activities with the University's research strengths in advanced energy; mining technology; defense and security; bioscience; and agriculture arid lands and water. We also span multiple industry sectors such as sustainability, optics and imaging, advanced manufacturing, informatics, and intelligent transportation systems and smart vehicles.

THE SOLAR ZONE

Through the Solar Zone, one of our nation's largest multi-technology solar demonstration sites, we have created a dedicated space to focus on research and development of energy storage and grid optimization. In 2017, we initiated Phase II by opening the Iron Horse Energy Storage and Solar Project, the first grid-connected lithium battery system project in North America, sponsored by E.ON. Energy storage systems like Iron Horse allow utilities such as Tucson Electric Power to use renewable resources more effectively and efficiently within their electric grid.

INTO FY2018

This year, we will continue to pursue expansion, with completion of the funding strategy, planning, design and initial construction of the Innovation and Technology Building at the UA Tech Park at The Bridges. We are also working towards implementation of The Village at the UA Tech Park at Rita Road, a 175-acre mixed-use development that includes retail, commercial, residential and hotel development.

GLOBAL ADVANTAGE

The Global Advantage (GA) program continues to attract domestic and international businesses to partner with the UA. This year, we dedicated the new GA offices at the UA Tech Park and executed five new client agreements with companies from Israel, Mexico and the U.S.

LOOKING AHEAD

Tech Launch Arizona's primary objective for FY2018 is to continue to grow the UA's IP and license portfolios in line with the ABOR performance metrics plan and updated TLA performance targets. Based on recent research expenditures in comparison to our peers, the UA is approaching its upper-limit of invention disclosures, licenses and startups. Even so, we still see headroom for growth.



FY2018 GOALS:

275
invention disclosures

102
total license agreements

62
exclusive agreements

14-17
startups

ADDITIONAL GOALS:

- Put a greater emphasis on culture change among faculty and generating invention disclosures
- Obtain funding and begin implementation of the UA Digital Healthcare Collaboratory
- Devise and obtain support for a long-term financial plan for TLA
- Complete the funding, planning and design phases, and initiate construction of the Innovation and Technology Building at the UA Tech Park at The Bridges
- Create a UA seed investment fund
- Deepen our coordination and connection with key ecosystem partners, including InnovateUA, Startup Tucson, the McGuire Center for Entrepreneurship, AzCI, the Arizona Center for Advanced Biomedical Innovation, UA Research, Discovery and Innovation, and others

THE TECH LAUNCH ARIZONA / TECH PARKS ARIZONA TEAM

David N. Allen, Ph.D.
Vice President, Tech Launch Arizona

Bruce Wright
Associate Vice President, Tech Parks Arizona

Doug Hockstad
Assistant Vice President

Joann MacMaster
Director, Business Development

Samantha Bankston Bares
Executive Associate, Planning & Project Management

Anita Bell
Acting Director, Arizona Center for Innovation

Tracy Bibeau
Executive Assistant to the Associate Vice President, Tech Parks Arizona

Iona Brinson
Intellectual Property Docket Clerk

Bruce Burgess
Mentor-in-Residence

Donna Callies
Executive Assistant

Sabrina Duarte
Administrative Associate

Justin Dutram
Director of Business Development, Tech Parks Arizona

Emilia Fajardo
AP/AR and Legal Doc Coordinator

Bernadette Franco
Accounting Supervisor/Human Resources Coordinator, Tech Parks Arizona

John Geikler
Assistant Director, Physical Sciences Licensing

Rakhi Gibbons
Associate Director, Biomedical & Life Sciences Licensing

Molly Gilbert
Director of Community Engagement, Tech Parks Arizona

Brenda Hough
Community Outreach Coordinator, Tech Parks Arizona

Taylor Hudson
Technology Marketing Associate

Lewis Humphreys
Software & IT Licensing Manager, Eller College Embed

Sherry Jameson
Coordinator, Business Development

Janet Kisinger
Senior Intellectual Property Manager

Craig Kleine
Information Technology Officer, Tech Parks Arizona

Lisa Lin
Licensing Manager, College of Medicine

Jianling Liu
Senior Business Analyst

Gus Loaiza
Accountant

Peter Loya
Tenant and Employee Relations Coordinator, Tech Parks Arizona

Kenneth Marcus
Director, UA Tech Park and Chief Financial Officer, Campus Research Corporation

Tod McCauley
Senior Licensing Manager, College of Agriculture and Life Sciences

Kevin McLaughlin
Mentor-in-Residence

Patrick Murphy
Director of Planning, Facilities and Construction, Tech Parks Arizona

Kaitlyn Norman
Business Intelligence Manager

Amy Phillips
Senior Licensing Manager, College of Optical Sciences

Linda Portillo
Executive Assistant

Grace Ratje
Manager, Finance & Administration

Rosa Saucedo
Accountant, Associate

Mike Sember
Mentor-in-Residence

Bob Sleeper
Senior Licensing Manager, College of Engineering

Eric Smith
Commercialization Network Manager

Paul Tumarkin
Senior Manager, Marketing & Communications

Jessa Turner
Director of Communications, Tech Parks Arizona

Kathy Williams
Office Manager, Tech Parks Arizona

Steven Wood
Mentor-in-Residence

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