innovation park at PENN STATE

Volume 9, December 2017

JOURNEYS

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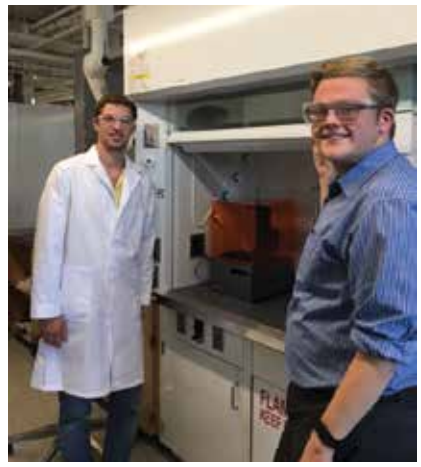
CIMP-3D BREAKS INTO INNOVATIVE INDUSTRIES UNDER NEW LEADERSHIP

DIRECTOR MICHAEL HICKNER SEES HIGH-GRADE POLYMERS AS THE MATERIALS OF THE FUTURE

Michael Hickner plans to keep CIMP-3D on the cutting edge of the industry.

Consider a world where you dent your car in an accident and, instead of heading to the body shop, you find a local 3-D printer. With the right specs, they print you a new panel. It might sound far-fetched, but Michael Hickner, the new director of Penn State's Center for Innovative Materials Processing through Direct Digital Deposition (CIMP-3D) believes we're almost there.



CIMP-3D is known for its metal additive superiority, but that's just the start of where the facility's research could go.

"Imagine printing a new part for your car, new braces, a new orthotic or even a new prosthesis or arm. 3-D printing allows us to bring manufacturing into smaller, more distributed spaces. With high-grade polymer parts, we can print really useful things," he says.

For Hickner, the road to CIMP-3D and his study of polymer science started back in high school. "I owe everything to my first chemistry and polymers teachers," he says. "Chemistry class in high school is what did it for me. I had a fantastic teacher in a small town and my passion for chemistry was ignited. It just made sense and was so interesting."

That initial excitement is still present when Hickner talks about how his work will impact the future. "What if we had screens that we could roll up and put in our pocket? Or a solar cell that we could paint onto the side of a building? Or a bottle that turns into fertilizer right after we use it? Plastics can make all of these things possible," he says.

"Imagine printing a new part for your car, new braces, a new orthotic or even a new prosthesis or arm. 3-D printing allows us to bring manufacturing into smaller, more distributed spaces. With high-grade polymer parts, we can print really useful things."

In the past, CIMP-3D has always been strong in metal additives, perhaps the strongest academically-oriented lab, in partnership with the Department of Defense, according to Hickner; but with his expertise, the lab is beginning to integrate polymers and composites into their research resume, and expand into the arenas of plastics, composites and polymer science.

Hickner feels this expansion is needed to remain on the cutting edge of the industry. "Polymers and polymer composites are incredibly useful materials," he notes. "The demand for polymers and composites in high-value applications is increasing. CIMP-3D needs to be in this space, so my job is to build a strong polymer and composites group within CIMP-3D to complement their reputation in metal additives."

Of specific interest to Hickner is the possible impact that polymer science could have on automobile and aerospace manufacturing. "Imagine cars with 100 miles-per-gallon fuel economy. We can probably get there with batteries and hybrids, but we can also get there with lighter automobiles. Light-weighting is a huge issue and will improve the fuel economy of cars and airplanes through the use of light polymer and composite parts — compared to metal and glass that we currently use."

Hickner believes Innovation Park provides CIMP-3D the opportunity to be a big influencer moving forward.

"CIMP-3D is a game changer in additive manufacturing and Innovation Park gives us the space to expand."

"CIMP-3D is a game changer in additive manufacturing and Innovation Park gives us the space to expand. We can do things at a larger scale to demonstrate new technology that is created at CIMP-3D or on campus. We can also bring in companies and demonstrate 'big' technology at Innovation Park. That is difficult to do on [the] central campus…I think we will see growing industrial activity nucleating around CIMP-3D because access is so good at Innovation Park," he notes.

When asked about his future as the new director of CIMP-3D, Hickner is most interested in contributing to Penn State and Innovation Park's reputation of excellence in research. "I'm not really interested in my own legacy," he says. "I only want to invest in things that are real and interesting and will move the ball forward in great science and engineering. That is my goal."

LOCAL STARTUP BRINGS BRAND-NEW SOLUTION TO ANTIBODY THERAPY

CHROMATAN REMOVES THE CUMBERSOME MACHINERY FROM CHROMATOGRAPHY, RESULTING IN MORE LIVES SAVED

During his decade working as an engineer for bioprocessing companies, ChromaTan founder and CEO Oleg Shinkazh says he saw significant problems in the industry, particularly when it came to inefficient, outdated technology.

In response, Shinkazh founded ChromaTan in 2008. The company, which worked out of Innovation Park's incubator, specializes in liquid chromatography to create medicinal drugs.
Now, the company is ready to expand into commercialization, thanks to a new FDA contract.

CHROMATAN
SINGLE-USE COLUMN-FREE PURIFICATION

What is Chromatography?

Chromatography is used to, for example, sort and purify antibodies for specific medicines. "[These antibodies are] usually for very serious conditions," Shinkazh explains. "This is not for your common cold. This is for cancer, inflammatory diseases and other very serious conditions. Antibody therapies have become one of the most successful drug classes in the history of business because they work. They improve people's immune systems to fight off specific conditions, and they've saved millions of lives."

The issue with chromatography is the equipment. The machinery required to perform this complex process is bulky, expensive and cumbersome. It requires cranes for installation, towering columns and large stainless steel cones. "The technology has been around since the 1970s," says Shinkazh. "It's old technology. So ChromaTan has come up with a way to get rid of columns and accomplish the same thing with a productivity of five to 10 times higher."

ChromaTan's novel purification process is called single-use, column-free purification. It removes the need for the bulky columns using modern principles of engineering as simple as the conveyer belt. According to Shinkazh, ChromaTan's methods are completely new to the market.

"That's where our main contribution is. We're getting ready to start commercialization at the end of next year to start selling the system, and the large FDA contract we received was a significant validation of our efforts."

Oleg Shinkazh is fighting outdated and cumbersome technology to save more lives via antibody therapy.

This recent FDA recognition has trained a spotlight on ChromaTan in the biotechnology world. The $2.5 million contract will fund a two-year project; ChromaTan will be working on purifying a monoclonal antibody (mAb), using the FDA funds to design and test a multi-unit operation process train.

Staying True to State College Roots

"The company stayed in Innovation Park because of an initial collaboration with Penn State professor Dr. Andrew Zydney and because of the support of the Ben Franklin Technology Partners," Shinkazh says. "They were very instrumental in helping us get established locally in State College. We're deeply grateful for them."

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ChromaTan began working with the Park in the Zetachron Incubator under the mentorship of Dean Bunnell of Indigo Biosciences. During the company's relationship with the Park, it also participated in the TechCelerator Program. ChromaTan continues to take advantage of the many resources Penn State offers startups. Last year, ChromaTan hosted several major companies in the biotechnology industry, bringing representatives to State College for an event co-sponsored by Penn State.

"We also have a very active internship program with Penn State and we've hired four people for the program so far," says Shinkazh. "We always have interns working for ChromaTan from the university, helping out in various positions, so that has been very helpful."

Five years after their initial collaboration with the Park, Shinkazh and his team are eager to expand and accept the challenges and benefits of their new FDA contract and expanding business.

"We are now entering the phase of growth into commercialization," says Shinkazh, "and I'm looking forward to larger successes."

HOW DOES IT WORK?

Unlike traditional chromatography, the ChromaTan process uses the resins needed for separation and purification of antibodies in the form of a slurry, which flows through a series of static mixers. A microporous hollow-fiber membrane retains the large resin particles, while allowing dissolved species (like proteins and buffer components) to pass through. A disposable flow path is used, creating an innovative continuous operation. The resin is suspended in a continuously circulating slurry, removing the need for large columns and large quantities of stored resin.

WHY HAPPY VALLEY?
THE SECRET BEHIND THE WIDESPREAD SUCCESS OF LOCAL ENTREPRENEURS

BUSINESS OWNERS AGREE, IF THEY HAD TO START OVER AGAIN, THEY WOULD STAY RIGHT HERE

When the Happy Valley area started making national news in rankings, many of the listings revolved around lifestyle. The area was named "Least Stressful Town in the U.S." by *Psychology Today* in 1988. Swift on its heels were praises for the area's safety, health, walkability, music scene and adventure culture.

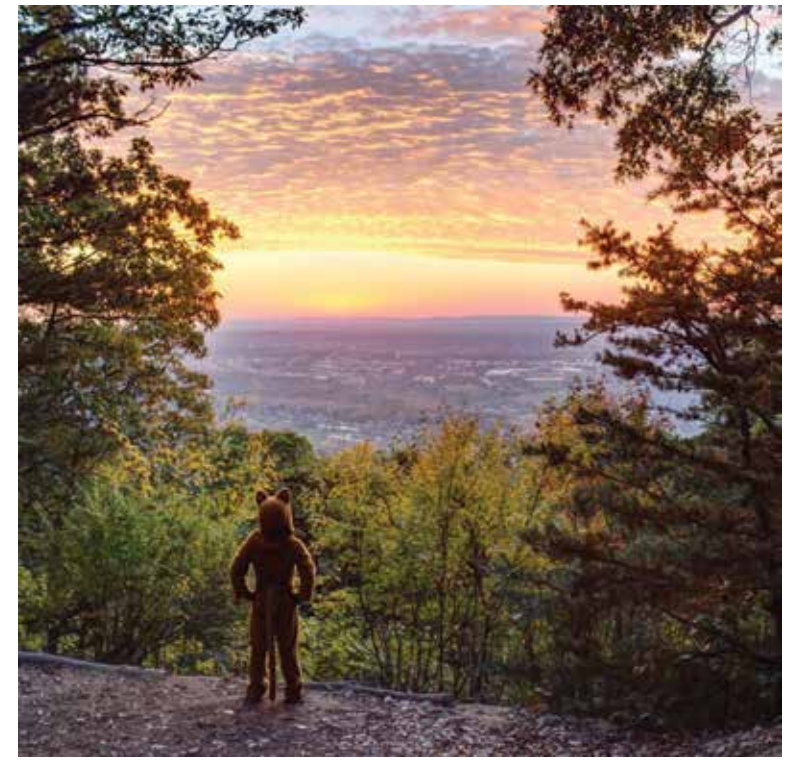
More recently, polls have reflected the innovation and research resources that Happy Valley offers. Livability.com named it one of the best cities for entrepreneurs, with statistics on venture capital deals, how much funding business owners received from SBA and 7(a) loans and how much money residents spent within their community. Personal finance company ValuePenguin named State College as a top city for new students to launch. Best College Reviews calls it "one of the smartest towns in America."

"It turns out that the same things that make Happy Valley conducive to innovation, startup success and entrepreneurialism also make it a great place to live."

It turns out that the same things that make Happy Valley conducive to innovation, startup success and entrepreneurialism also make it a great place to live. Startup founders point to the benefits of having legal advisors, marketers and manufacturers at arm's reach. The same thing is true for livability — good daycares are located near jobs, restaurants are within walking distance and you can choose between spending the evening at a remote state park or at a Broadway show, and not have to worry about the traffic on the way home. Many business people are relocating to State College and still enjoying big, city-style, farm-to-table, haute cuisine and nationally-acclaimed performances, while enjoying trademark Happy Valley fun like Arts Fest and the Homecoming parade. Combine this with the low crime rate, lower cost of living and great schools, and it starts to become pretty clear how Happy Valley received the "Least Stressful Town in the U.S." ranking.

It's something that we've known all along: Happy Valley offers both a livable city and an innovative work culture. A low-stress, adventure culture fuels productivity and invention. Is this the secret to entrepreneurial success in Happy Valley? Local startup founder Juan Mario Gomez says it best: "If I had to start again, I would do it here."

Speaking with local business people, a singular theme emerges — while their companies, products and backgrounds vary, their reasons for living and launching their businesses here in Happy Valley are very similar. Here are just a few.



"People who live in this area of Pennsylvania like living here and want to stay here," says one local entrepreneur. *Photo Credit: Instagram, jack_davis_615*

A Competitive, Low-Cost Ecosystem

Juan Mario Gomez, CEO of Xact Metal, says it's very difficult to match the innovation of the area. "We have access to the university, students, faculty and outstanding resources — we have a world-class 3-D printer right at our doorstep. It would be difficult to have this same level of success if we were not as close to Penn State."

At times the size and relative remoteness of the Centre County region can be viewed as a detriment, but Gomez says it's actually the other way around. "I have found that people who live in this area of Pennsylvania like living here and want to stay here. There is a huge amount of talented, hard-working people who are committed to making our company succeed. I don't know if it would have been as easy to start up in a larger city and attract the same amount of talent."

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He also points to Central Pennsylvania's history as a manufacturing mecca. His company works with world-class suppliers and producers within an hour's drive from State College. The entire area offers a

competitive, low-cost ecosystem made of hard-working, adaptable professionals who love what they do.

"Before starting Xact Metal, I thought about moving, but I quickly found the culture so favorable, I asked myself, 'Why would I move?' Anywhere I would go, I wouldn't be set up to be this successful."

A few years ago, Gomez was part of a company that closed its Central Pennsylvania branch. "Before starting Xact Metal, I thought about moving, but I quickly found the culture so favorable, I asked myself, 'Why would I move?' Anywhere I would go, I wouldn't be set up to be this successful." The highways into State College, these great highways, he calls them, are like arteries that pump life into Happy Valley, connecting it with the rest of Pennsylvania and the world. "It's easy," he says. "It's so easy to get people here. Not just people, but good people. People that honestly want you to succeed. Combined with the work culture of students and fully-invested faculty, the work culture has an energy and optimism that nurtures success."

Innovation and Support

Communication technology company OGOVO recently graduated from Happy Valley LaunchBox's startup accelerator, where it got early-stage mentorship for its product, PairSense, a system of networked sensors that collects and analyzes foot traffic in urban communities and hosts software to more cost effectively manage services such as keeping streets clean, repairing sidewalks, collecting waste and optimizing routes for first responders.

"There is so much support for entrepreneurs to get started and get growing," Michael M. McCarthy, co-founder and president of OGOVO, says.

The resources go beyond the university — Ben Franklin Technology Partners, Invent Penn State, Happy Valley Launchbox, Innovation Park, Global Entrepreneurship Week Penn State (GEW), New Leaf Initiative, Small Business Development Center (SBDC) and the Chamber of Business and Industry in Centre County (CBICC) come alongside other local technology partners to create a network that truly helps startups succeed.

McCarthy also enjoys the Centre County location. "We have a strong loyalty to the Centre region. Luckily for me, and so many others, Penn State and State College is one of the most innovative and supportive town and gowns in America — and at the top of the list in the entrepreneurship conversation."

Funding Opportunities and Low Costs

Benjamin Hall, founder of L4IS, a 3-D imaging and tomography technology company, sees Penn State as a huge perk for local entrepreneurs. "The school is a tremendous resource for expertise in a wide breadth of fields, and has a population of bright-eyed and motivated students. The business incubator, in conjunction with Ben Franklin Technology Partners, allowed us to develop a basic skill set and understanding of this new startup world, and provided opportunities for getting initial funding to launch."

"I can't imagine a scenario where [launching L4IS] could have been possible without these key resources in place; the support and environment were critical to get my company off the ground."

Funding and, of course, cost is part of the convenience conversation for startups. Not only do entrepreneurs have resources that are typically available in places like New York City and Silicon Valley, but they are available much more affordably. Everything from rent to marketing and design costs are available at the same caliber as in a big city, but at a fraction of the price.

Good daycares located near jobs is just one of the livability benefits of State College.

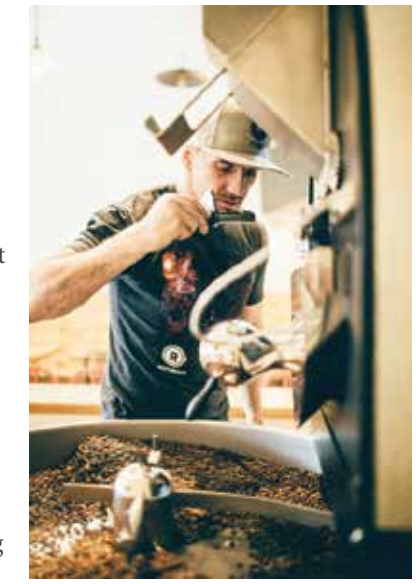
"The location offers easy access to most vital elements required to start a company — like equipment, people and low costs for leasing space," Hall says.

"I can't imagine a scenario where [launching L4IS] could have been possible without these key resources in place; the support and environment were critical to get my company off the ground," he adds.

Work Culture

It's not just technology companies that enjoy the resource benefits of the innovation culture, though. Jamie Bestwick started Rothrock Coffee on Atherton Street after living in the area for 18 years. "The local community really embraces business startups in this town; it's a point of pride for the 'ever-growing valley' to become more than just a slogan for a great community but, to nurture new brands that are embraced far and wide of the valley."

For Bestwick, the location and culture work together to create a great combination. "We are very lucky that agriculture in the area is incredibly good. It's a priority for us to have partners with the same high standards for finished products as we do. It's been a great experience to also provide critical feedback to our partners in order to further enhance our products, which ultimately delivers on our promise to our customers. We also see ourselves as an opportunity to be an outlet for other startups, to showcase their products in our business; building other partnerships through your own success is vital to growth and progression in this area."



For the founders of Rothrock Coffee, State College's location and culture are a great combination.

CO.SPACE FILLS THE GAP

A NURTURING ENVIRONMENT FOR BUDDING ENTREPRENEURS TO CALL HOME

This January, co.space will welcome its 100th resident into the shared living space located in downtown State College. Founders describe co.space as a diverse group of individuals — "from social entrepreneurs to sustainability enthusiasts, educators to agriculturalists, tinkerers to designers" — trying to find purpose in their lives and supporting one another in their efforts to be what they call "effective changemakers."

Like many other local programs, co.space supports the community's entrepreneurial ecosystem — but not in the traditional sense.

"I think State College often gets stuck feeling like it should tell stories equivalent to those out of Silicon Valley, but as a small town, we need to position ourselves differently. What if we position our narrative more around the idea that we're a community..."

"co.space takes a nebulous, small-scale approach to entrepreneurship," co-founder Spud Marshall explains. "I think State College often gets stuck feeling like it should tell stories equivalent to those out of Silicon Valley, but as a small town, we need to position ourselves differently. What if we position our narrative more around the idea that we're a community where you can actually

co.space supports the community's entrepreneurial ecosystem, but not in the traditional sense.

co.space describes itself as a diverse group of individuals, trying to find purpose in their lives.

build meaningful relationships and where you can fail easily because there are people here who are going to support you and treat you like family?"

Marshall and co-founder Christian Baum spent their 20s pursing various ventures in the area. While those years were filled with excitement, Marshall says it was often a lonely lifestyle.

"There really wasn't an entrepreneurial ecosystem built around the time that we were doing our start up work," he explains.

In relation to their startup, though, the most important conversations they had in their lives came from spontaneous moments — not organized events.

"We realized that if we created a space where people could build community and have those powerful conversations, then they may be able to create the relationships that would allow them to succeed in the entrepreneurial ecosystem and whatever career path they choose."

"We realized that if we created a space where people could build community and have those powerful conversations, then they may be able to create the relationships that would allow them to succeed in the entrepreneurial ecosystem and whatever career path they choose," Marshall says.

With that vision in mind, co.space emerged, filling a gap in State College's entrepreneurial ecosystem. Rather than supporting entrepreneurs who already have a business idea or are seeking investors, such as Happy Valley Launchbox or the TechCelerator, co.space focuses on creating spontaneous moments and helping students and young professionals find meaningful paths in life.

co.space residents come to form a very close family.

Living at 244 East Nittany Avenue

"Creating a good experience for our residents requires a [thorough] vetting process," Marshall admits. "We look for tenants who are self-aware and who actually want to contribute to the world in a positive way."

"Creating a good experience for our residents requires a [thorough] vetting process, We look for tenants who are self-aware and who actually want to contribute to the world in a positive way."

Those who become residents come to form a very close family. They take part in weekly community dinners; host guests and mentors in an effort to build meaningful relationships that could advance their careers; are encouraged to be creative and pursue entrepreneurial endeavors; and have 24/7 access to a coach who is widely experienced in social, environmental and community change.

"As I was looking to transition to international work, the co.space served as a foundation of friends, lessons learned and inspiration to go forth and make a difference. After traveling the world for a year, I yearned to reconnect with a community and found myself back in State College as program director of Thought For Food."

Outcomes

So, what impact does co.space have on its residents? The answer varies greatly. Some tenants gain the experience and connections necessary to launch a startup, while others discover a career path they hadn't considered.

Here's a look at just a few of the success stories:

"At the time [I lived in the co.space], I was a young startup founder, and the community of support from both within the house and the community that Spud and Christian built, helped us take our venture farther than we ever imagined. As I was looking to transition to international work, the co.space served as a foundation of friends, lessons learned and inspiration to go forth and make a difference. After traveling the world for a year, I yearned to reconnect with a community and found myself back in State College as program director of Thought For Food."

-Jared Yarnall-Schane

"In the co.space, I had the opportunity to innovate directly within the home, to make the space my own and to begin working on my personal and startup projects. For me, that meant indoor and alternative agricultural hardware projects."

"In the co.space, I had the opportunity to innovate directly within the home, to make the space my own and to begin working on my personal and startup projects. For me, that meant indoor and alternative agricultural hardware projects. We built living walls and hydroponic furniture, but probably the biggest crowd-pleaser was the indoor honeybee hive that we started in the spring of 2015. Flash forward to today, and the co.space beehive prototype has become a company called BEEcosystem. We began producing and selling our first BEEcosystem hives in January of 2017, and we're launching a new crowdfunding campaign to help us scale up our manufacturing ahead of the Spring 2018 beekeeping season."

-Dustin Betz

Marshall and Baum strive to create memorable experiences for residents at co.space in the hopes they'll want to stay in State College or come back to the area someday. They give people the space, encouragement and opportunities to build their own entrepreneurial paths in life and become change-makers. And, if we're lucky, some of those change-makers will put down roots in Happy Valley.

co.space focuses on creating spontaneous moments and helping young professionals find meaningful paths in life.

BIG GOAL, BIGGER RESULTS

LOCAL TECH FIRM FOCUSES ON CUSTOMER SUCCESS...FOR ASTONISHING RESULTS

BY BEN LAWRENCE
VICE PRESIDENT, KCF TECHNOLOGIES, GUEST CONTRIBUTOR

For 2017, my company set its most aggressive target ever: $100 million. Not a sales goal, mind you, but a customer savings goal.

The premise:

By focusing on our customers' success more than our own, the good karma would strengthen customer loyalty and increase business more than fancy advertising and pushy sales tactics ever could.

Eleven months ago, the goal seemed impossible. For starters, we'd have to deliver to our customers an ROI that even the world's greatest gambler could never imagine: 10X. Give KCF $1 today and by year's end you'll get $10 in return.

In addition, we'd have to persuade our customers to share cost metrics that are often confidential. Oh, and one other barrier — we had nowhere near enough customers or revenue to reach a 10X ROI of $100 million. Somehow, some way, we'd have to more than triple sales to have a shot at making it.

The last 10 months have been fun, but no picnic. It's been filled with major culture shifts in how we interact with our customers, chasing down customer metrics that would typically be none of our business and shifting hiring criteria to align with a service-oriented approach. The result?

On the day I'm writing this, Nov. 11, 2017, our customers' cup runneth over, with $100 million in proven savings and rising fast. *Wow*.

"Since January, our commercial customers have flooded us with more accolades, thank you cards and sales orders than in the previous 16 years combined."

Paper mills are reducing downtime. Auto plants are catching machine failures that've plagued them for decades. Oil and gas fleets are running more cleanly and safely. Chemical manufacturers are optimizing their production process.

Since January, our commercial customers have flooded us with more accolades, thank you cards and sales orders than in the previous 16 years combined, and, in honor of Veterans Day, one more tidbit — nearly every penny of that $100 million came from American facilities. The takeaway for America — give us a smart factory, strong leadership and open-minded workers, and we'll dance circles around the old-school, penny-pinching, tax-evading sweat shop trying to win on price.

How will we celebrate? We're throwing a party that includes fireworks and a marching band. This is Happy Valley after all!

Among those on the invitation list:

- Our customers (of course)
- Our employees and their families
- Our company founders
- Our government agency, military and SBIR partners
- Our suppliers
- Our friends
- Our community leaders
- Our local fire department (if they'll let us shoot off fireworks)

This holiday season, my gratitude extends to the KCF Tech colleagues and customers who've proven what a cutting-edge Internet of Things strategy can do to awaken and revitalize American industry. One hundred million may not be enough to move the needle on our nation's GDP, but it's enough to indicate we're on the right path.

"How would your business grow if you fretted less over your own sales goals and more on your customers' ROI? If you begged your customers to teach you more about their pain points so you can figure out how to eliminate them?"

How would your business grow if you fretted less over your own sales goals and more on your customers' ROI? If you begged your customers to teach you more about their pain points so you can figure out how to eliminate them? Zig Ziglar said it best: "You can get anything in life you want if you just help enough other people get what they want."

What do your customers want? A better ROI? Recognition? A promotion? A safer work environment? Insight into how to do their jobs better?

Unlock that secret desire and watch the fireworks fly.

IS YOUR STATE COLLEGE COMPANY DOING SOMETHING INNOVATIVE? WANT TO SHARE YOUR STORY?

To submit a guest article to appear in an upcoming issue of *Journeys*, email coolbluelady@psu.edu.

HOW'D THEY DO THAT?

Tilt-up construction speeds progress at 310 Innovation Blvd.

To see the timelapse of construction at 310 Innovation Boulevard, go to...
https://vimeo.com/235836518

https://app.oxblue.com/open/clayco/BuildingHInnovation

310 Innovation Boulevard is the future site of Morgan Advanced Materials' Carbon Science Centre of Excellence.

IS STATE COLLEGE THE NEW MATERIALS VALLEY?

ADVANCED MATERIALS COMPANIES PROVIDE NEW OPPORTUNITIES

A timelapse camera is set up at the construction site of 310 Innovation Boulevard. Since the groundbreaking in June, the camera has captured the fast build time, from the tilt-up walls that were cast on the foundation and lifted into place, to the single-story, 17-foot-high ceilings that allow for tall equipment. The exterior design that rises from bare earth in the timelapse video — as groundbreaking and innovative as it is — is just the beginning of the story at 310 Innovation Boulevard.

"It is a flex building, meaning that it is flexible in its uses and therefore can be used for research, development, light manufacturing or office space as needed."

Strategic By Design

"We are all very excited about the new building and what it represents," Jeff Fortin says. "This building was envisioned as part of the master plan for the Park, and it is great to see that it is coming to fruition. Our office works with companies to identify their challenges and needs and then look across Penn State to find out if we have expertise that can help them with their needs. We are sort of like match-makers, connecting companies' needs to the capability of our faculty,

Morgan will staff the new facility with up to 25 researchers within the first three years, and will take almost 11,000 of the 30,000 square feet available.

staff, students, facilities, etc. We really want to see the research and expertise of Penn State be applied and have impact. This is exactly what we expect in our partnerships with the new tenants of 310, Morgan and RJ Lee."

Fortin is director of the Office of Industrial Partnerships (OIP) at Penn State. His office fosters strategic relationships with industry partners, supporting Penn State's entrepreneurial ecosystem and accelerating the pace at which technologies move from discovery to implementation. The 310 building is a manifestation of the OIP's engagement with strategic companies who are establishing bases at Innovation Park, in order to

"Our focus for this building is to have it be filled with companies that are collaborating with Penn State on multiple fronts, particularly on research and development."

The timelapse camera at 310 Innovation Park captures the fast build time of the one-story, flexible-use building that will house Morgan Advanced Materials and RJ Lee, a leading industrial forensics analytical laboratory.

engage with Penn State and the Happy Valley region.

He points out that there are two key aspects that set the new building apart. "First, it is a flex building, meaning that it is flexible in its uses and therefore can be used for research, development, light manufacturing or office space as needed. The second aspect is that our focus for this building is to have it be filled with companies that are collaborating with Penn State on multiple fronts, particularly on research and development."

The Emergence of Materials Valley

One of the building's first tenants is the 10,800-square-foot Morgan Advanced Materials' Carbon Science Centre of Excellence. Morgan Advanced Materials is a world leader in advanced materials science and engineering of ceramics, carbon and composite, headquartered in the United Kingdom.

"We believe this building will bring even more companies and talent to the region, what some are referring to as 'Materials Valley'."

Fortin explains, "Penn State has a long history of leadership in research and development in materials science and engineering. It is one of our core strengths. Our Materials Research Institute led by Director Clive Randall is very focused on solving industry problems and transitioning their groundbreaking research into society."

In March 2016, Penn State received an inquiry from Morgan Advanced Materials, who was on a mission to identify a proper place for a new Carbon Science Centre of Excellence. After a few months of discussion, the company made the decision to locate its new centre in Innovation Park, in the new building. The space, location and partnership with Penn State was exactly what Morgan was seeking.

"We have a multi-element collaboration in place now that includes research engagements with our faculty, access to our state-of-the-art materials characterization facilities, opportunities for student internships and full-time hires," Fortin says. "[Morgan] will staff the facility with up to 25 researchers within the first three years and will take almost 11,000 square feet of the total 30,000 feet."

Given this new collaboration, it was only natural to continue looking for other materials companies that would be a good fit for working with Penn State. In August, RJ Lee, a leading industrial forensics analytical laboratory headquartered in Pittsburgh, joined in, and committed to opening a laboratory in the building. RJ Lee plans to hire 10 full-time scientists and technicians to work out of the facility.

In an interview with Penn State, a representative from RJ Lee said the company was excited about opportunities for increased collaboration in materials, transportation, information sciences, life sciences, agriculture, energy and advanced additive manufacturing. Representatives also noted the benefits of close proximity to CIMP-3D and the additive manufacturing community in Innovation Park, and the opportunity to develop collaborations in a rapidly-growing field.

OIP is reaching out to companies with existing Penn State relationships, companies that rely on advanced materials or advanced manufacturing technologies to enhance their products. One area of particular interest is additive manufacturing, since OIP sees the opportunity to build out a hub of additive manufacturing-related companies, given the expertise in metal-based additives at CIMP-3D.

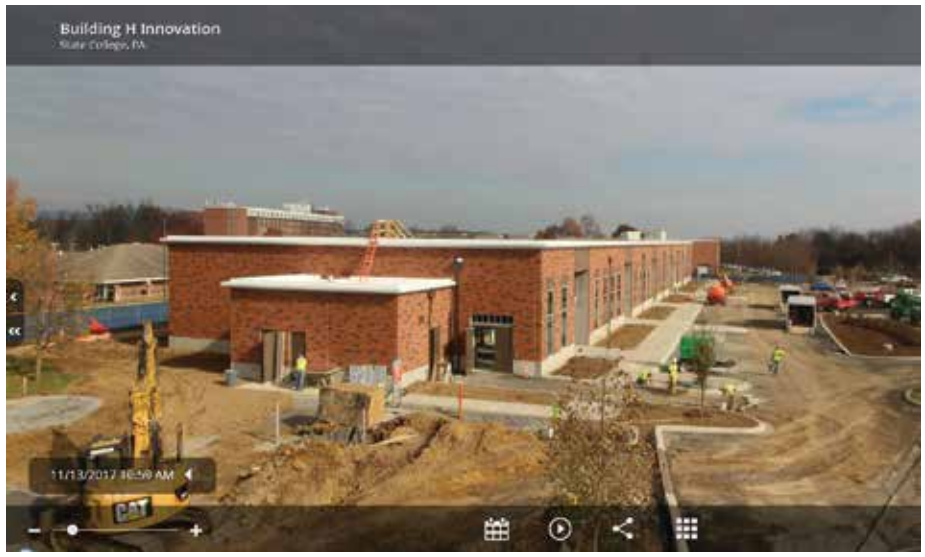
The addition of businesses like RJ Lee and Morgan Advanced Materials are also a boon to the local ecosystem and Penn State's advanced materials community, and reinforces the area as a growing hub for advanced materials and manufacturing innovation.

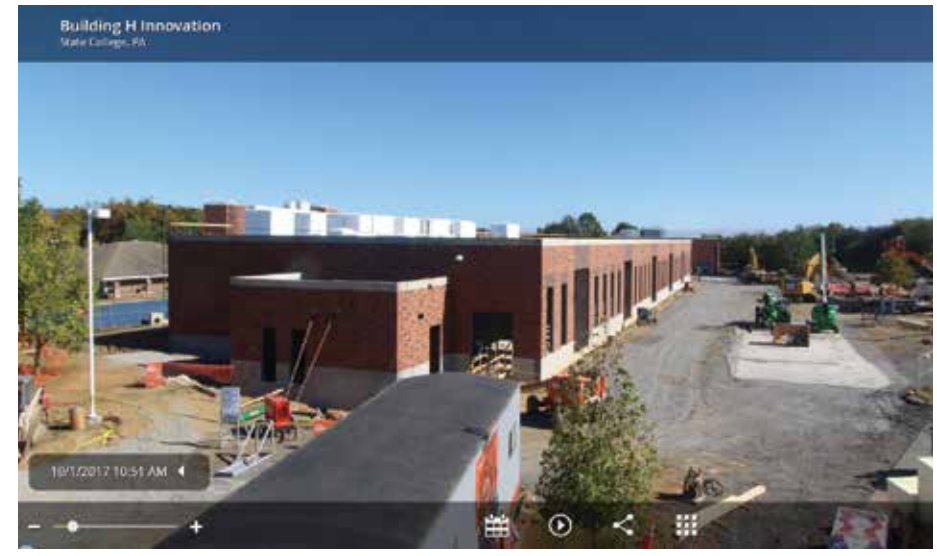
"We see this as the beginning of building out a strong materials hub in the region," Fortin says. "These companies will hire from the local workforce and will also bring new talent to the area; they will buy houses and add to the economy. We believe this will bring even more companies and talent to the region, what some are referring to as 'Materials Valley'."

To see the timelapse of construction at 310 Innovation Boulevard, go to...

https://vimeo.com/235836518

https://app.oxblue.com/open/clayco/BuildingHInnovation





CONTEST GIVES INVENTIVE LOCALS A CHANCE TO SHINE

THERE ARE NO LOSERS IN THE BEN FRANKLIN BIG IDEA CONTEST

Ben Franklin Technology Partners encourages innovation and new ideas all over Pennsylvania. One annual initiative that supports this mission is the organization's BIG IDEA Contest. Open to inventors and innovators in 12 Pennsylvania counties, it's an opportunity perfect for anyone with a great idea for a new product, process or software application.

The prizes are by no means shabby. The first-place winner receives $25,000 in cash, priority access to pre-seed investment (which is valued up to $10,000), a one-year pass to seminars from Ben Franklin's eMarketing Learning Center and free consultation on accessing federal grant money. Second place receives $15,000, and third place $7,500. The People's Choice award offers $2,500.

Who qualifies? Anyone planning or building a new product, process or software application, who has never received a Ben Franklin investment and who is still considered in the start-up stage of business — meaning the company did not exceed $500,000 in sales in the last year.

Applicants are judged based on a few criteria — management team strength, market opportunity, viability and the technology or innovation itself. At first, 10 finalists are chosen, and the winners are hand-picked from those 10.

One startup founder walked away one big step closer to his dreams.

For 2017, Jill Edwards, executive director, Ben Franklin Venture Investment Forum and Innovation Transfer Network, notes, "The ideas that were submitted in large part reflect the region — a number of software and device application ideas, products developed for business and consumer markets, some medical devices. That tends to be the case regardless of the area in Pennsylvania where we hold a contest. Because the applicants have lived and worked in whatever the eligible area is, they tend to use the experience they have in the area's business ecosystem to develop new ideas that make use of existing resources, suppliers, work skills locally available, etc."

So, Who Were the Winners?

Hunter Swisher took home the top prize, for Phospholutions, receiving $25,000 and seed grant funding worth $10,000.

Heather Moyer and Crossroads Consulting won second place, and Mark Kasterko took third. Kasterko additionally won the People's Choice Award, which comes with an extra $2,500 prize.

Regardless of win or lose, though, Edwards says the experience is well worth the effort for every single contestant.

"We always say that every applicant wins by applying to the BIG IDEA Contest, because the act of creating a contest application requires research and reflection about how to take the idea forward and who might want to buy what's being developed to sell."

MEET THREE STAND-OUT STARTUPS!

Mark Kasterko with MT Arms

1 (Somerset County)

MT Arms is producing technology for firearm retention, allowing law enforcement to free up their hands, while still safely securing their weapons.

Hunter Swisher with Phospholutions

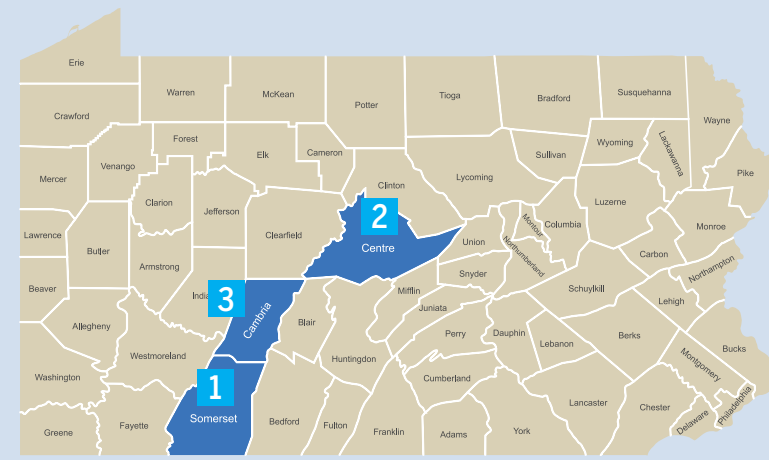
2 (Centre County)

Phospholutions was created by recent Penn State graduate, Hunter Swisher, a plant sciences major. RhizoSorb is Phospholutions' flagship product, and is a turf maintenance product promoting better and deeper root growth and reducing fertilizer wash-off.

Heather Moyer with Crossroads Consulting

3 (Cambria County)

Crossroads Consulting was established in 2006, but became a woman-owned small business under Heather Moyer's leadership just last year. Specializing in technical consulting, Crossroads Consulting offers a full suite of services, including prototyping. Moyer is currently working on ways to predict workplace accidents.



STATE COLLEGE STARTUP QUIETLY MAKES ITS MARK

DEFENSE TEAMS ACROSS THE GLOBE, AND EVEN NASA, DEMAND THE UNASSUMING TECHNOLOGY MANUFACTURED HERE

RTD Embedded Technologies, Inc., occupies a two-story portion of Innovation Park's 103 building, the non-descript office belying the extremely technical and highly specialized work inside. It's there that approximately 35 individuals show up to work each day, engineering computer and tech solutions for some of the most rugged, extreme and life-or-death environments in the world.

Incorporated in 1985, RTD is a State College startup through and through. The local founders graduated from the CBICC's business incubator, and moved to Innovation Park in the early 2000s, and are now not only attracting Penn State graduates to their office, but also engineers from all over the country, who are more than pleased to move to Happy Valley.

"We are in a market where continuous improvement is highly valued, so continuing to innovate, continuing to talk to our customers and meet their needs, those sorts of things are always important to us."

Around the World and Beyond

RTD's products appear nearly everywhere, from spacecraft to oil rigs, and their crucial nature requires they work right, the first time, and every time. That's why these specialized computers undergo multiple rounds of testing before making it to the client, many of which are in the defense industry and spread across the globe. High quality and high reliability are nothing out of the ordinary for RTD, though.

RTD is certainly an example of a truly successful State College startup, and it has the decades of continual improvement and increasing growth to prove it.

According to Stephen St. Amant, vice president of marketing and communications, "RTD caters to the customer who really needs high reliability… Our engineers are very talented and very focused on making the best product that we can make, really meeting customers' needs."

This standard of excellence has been the catalyst behind RTD's slow and steady growth since 1985. As the company built a market reputation for its highly reliable products and those that meet very specific needs, customers began to recognize RTD for the void it fills in the marketplace.

"We define success through the lens of our customers. If our customers are successful, then we're successful."

Moving forward, St. Amant assures that RTD has no intention of changing the strategy that's proven so successful. "[We'll] continue to provide the best products to meet our customers' needs. We are in a market where continuous improvement is highly valued, so continuing to innovate, continuing to talk to our customers and meet their needs, those sorts of things are always important to us."

He goes on to explain how RTD defines its success, as the company puts the focus on the customer's success. "We define success through the lens of our customers. If our customers are successful, then we're successful. It's often the customers that are most happy with our product that we don't hear from. They're working on these projects that have been running for a decade without issue, and we hear from them when it's time for them to move on to the next generation of their project."

Making a Home at Innovation Park

Since moving to Innovation Park, RTD has been nothing short of thoroughly pleased with the experience.

"Innovation Park is nice," says St. Amant. "It's easy to access. There is not a lot of traffic that you have to worry about. People in the Park are friendly. It's a nice place to walk during lunch or breaks. There are food trucks here from time to time…Penn State has a vibrant community. Our people feed off of that."

RTD is certainly an example of a truly successful State College startup, and it has the decades of continual improvement and increasing growth to prove it.

For fellow State College technology companies, Innovation Park tenants and startups, St. Amant offers a few words of advice based off RTD's success: "I think we've learned a lot through being patient. The economy goes up and down, but if you believe in your product, and you're making measured decisions, then you'll be able to ride the tide."

BUSINESS RESOURCES & EVENTS

SBDC Seminars

SBDC courses, seminars and conferences provide up-to-date, practical information on a wide variety of business topics and are designed to educate entrepreneurs about new and innovative management procedures. The programs teach basic business skills as well as more advanced and specific business management. These low-cost workshops feature experts and leaders from industry, government, higher education and professional associations.

The First Steps of Starting a Business

When: Jan. 9; 9 a.m.-12 p.m.
Where: 200 Innovation Blvd., Suite 243
Cost: $20

Have you always had a dream to start your own business but didn't know where to start? This workshop will help aspiring entrepreneurs to begin the process of successful business ownership, including evaluating business ideas, developing a business plan and exploring financing options.

Learn from a business consultant about:

- lifestyle requirements of business owners
- how to assess the feasibility of your business idea
- the legal and tax implications of owning a business
- how to develop a business plan
- how to compile a bank-ready financial package
- how to market your product or service
- the health and safety regulations that may apply to your business
- where to find other resources that may help you succeed

Learn more: sbdc.psu.edu/events

Helping Businesses Compete with Technical Assistance

To help local businesses grow, PennTAP actively promotes training and education opportunities to clients. They provide online training through webinars hosted by technical advisors, in addition to hosting in-person learning events and conferences throughout the year.

Training typically encompasses one or more of the pillars of Advanced IT Solutions, Energy and Environmental Services, or Innovation Services.

Learn more: penntap.psu.edu/events

Taco Tuesdays in the Park

Join us for Taco Tuesday in the Park! Visit Salsa's Food Truck, 10:30 a.m. through 2 p.m., between buildings 328 and 330!

Toastmasters

Looking to enhance your communication and leadership skills? Join Toastmasters. The club meets the first and third Wednesday of every month, at noon, in the 329 Building, Room 413.

HappyValley.com

Discover all the best things to do and see when visiting Happy Valley, whether you're exploring the area while on business, in town for one of the many local events and festivals or a lifelong resident. Check out our calendar of events, top-notch recommendations and more!

Learn more: HappyValley.com

CBICC Events: Strengthen and Grow Your Professional Circle

CBICC Business After Hours are held from 5:30 to 7:30 p.m. The cost to attend is $5 for members, $20 for nonmembers. All employees of a member business receive the member rate. Be sure to invite your coworkers and team! Business After Hours are a great way to learn more about Centre County's business community while enhancing your professional network.

Learn more: cbicc.org

Building Local Business Through Tourism

The Central Pennsylvania Convention & Visitors Bureau (CPCVB) is a nonprofit, membership-based organization that promotes travel-related activities and coordinates visitor services to bring people to Central Pennsylvania and boost economic activity. Membership connects local businesses to a network of business professionals who understand that travel and tourism are vital to the overall wealth and economic strength of the region.

The CPCVB operates the Centre County/ Penn State Visitor Center, a state-of-the-art facility serving hundreds of visitors each day. Guests can find out what's happening in the area and pick up brochures on Central PA Businesses, attractions and outdoor recreation. The Center is open and staffed seven days a week.

Learn more: visitpennstate.org

AWARD-WINNING NAMES **IN INNOVATION**

It's just another day at the Park! Check out some of the honors and accolades boasted by some of our residents. Could your company be next?

HigherEdJobs Aspire Higher®

2016 Innovator of the Year/Mid-sized Employment Site, Stars of Recruiting Innovation Awards

2016 WEDDLE's User's Choice Award

WPSU PENN STATE

Outstanding Television Public Affairs Program, Outstanding Use of Digital Media, Outstanding Radio Feature, The 2017 Pennsylvania Association of Broadcasters Awards

Excellence in Innovation, 2017 Regional Edward R. Murrow Award

Blackboard

First Place, LMS & E-Learning Platforms, Campus Technology

Voted in Top 10 Overall Favorite Technologies Used by Higher Education Professionals

SIEMENS

Best PLM Systems Provider and Best CAM Systems Provider, Asian Manufacturing Awards

CIMP-3D

First Place, Modeling Challenge for Additive Manufacturing

See the back of this issue for more on how your company can join the community at Innovation Park!

INNOVATION PARK

SPACE FOR LEASE

http://www.innovationpark.psu.edu/

- High quality master planned Class A professional office and research park
- On-site professional property management
- Abundant free parking
- High-grade construction materials, efficient design and immaculately landscaped
- Penn Stater Hotel
- Daybridge daycare services located within Innovation Park
- Free CATA public bus transportation service every 20 minutes to/from University Park and surrounding community

Newmark Grubb Knight Frank

FOR MORE INFORMATION CONTACT:
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INNOVATION PARK

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http://www.innovationpark.psu.edu/

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- Penn Stater Hotel
- Daybridge daycare services located within Innovation Park
- Free CATA public bus transportation service every 20 minutes to/from University Park and surrounding community

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