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park**  
at PENN STATE

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# JOURNEYS

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## RESPONSIBLE ENERGY: A FAMILY TRADITION THAT'S HELPING TO FUEL THE WORLD



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## SPECIAL CONFERENCE ISSUE

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# WELCOMING THE FUTURE OF AGRICULTURE BASF MOVES IN AFTER ZEDX ACQUISITION

Innovation Park is excited to welcome new tenant BASF to building 328. While the company is new to the park, it already has deep roots here at Penn State. In 2017, BASF acquired ZedX, a leading digital ag intelligence company born from Penn State research and officially founded in 1987.

As a Penn State faculty member, ZedX Founder Joe Russo worked with a team from various disciplines throughout the University to develop agronomic modeling software. The product uses data on weather, pests, disease development and other factors to create models that aid farmers in crop protection and management. For example, if there is a disease in a specific crop in Maryland, the model can predict the likelihood and timeframe of seeing the same disease in other locations, helping to determine when to apply fungicide.

BASF acquired ZedX after a three-year partnership between the companies yielded positive results. Russo said, “Our modeling expertise coupled with BASF’s knowledge of chemistry has

truly benefited growers and agriculture. For example, we developed a model that, based on important weather and environmental conditions, identifies the right window of application for a BASF herbicide.”

BASF is a welcome addition to the thriving ecosystem in Innovation Park, adding to a growing digital ag cluster on campus and keeping Penn State at the forefront of the rapidly advancing ag industry.

The future of farming is here, literally. ■

**FUN FACT: BASF CURRENTLY EMPLOYS ABOUT 160 PENN STATE ALUMNI ACROSS ITS VARIOUS LOCATIONS.**



*Paul Morris in front of Blackhawk's oil tanks.*

# RESPONSIBLE ENERGY: A FAMILY TRADITION THAT'S HELPING TO FUEL THE WORLD

BLACKHAWK ENERGY CEO PAUL MORRIS ON HONEST WORK, ACCOUNTABILITY AND GROWING A BUSINESS THE WORLD NEEDS

Paul Morris has energy in his DNA. It started when his great-grandfather CJ Morris dropped out of school in 7th grade to support his family when his own father died. When his great-grandfather went into business for himself, he moved drilling rigs with horses around the Bradford, PA area, which was a boom town in McKean County at the turn of the century. He would disassemble a wooden rig, piece by piece, by hand, and move the pieces to another job site by horse and wagon and then rebuild the rig. A few decades later, his son Tom took over, providing jobs for the greatest generation when they came home from war. By then the horses had turned into bulldozers and trucks, and the rigs were made of iron, but the work was just as hard and as necessary as ever. In 1979, new air rotary drilling technology was cutting edge, allowing drilling companies to drill wells faster. Paul's father Tom Jr. steered the company in that direction and grew it steadily for several decades.

So for four generations, the Morris family has been part of the energy solution, helping to do

more than just heat homes and power vehicles.

But even with their long-standing pedigree of responsible drilling, involvement in the community and honest hard work, Paul gets it if you don't like what he does.

The F-word has that effect on people.

He's met me on a Sunday morning in his office at the Incubator in the 200 Building of Innovation Park for our interview. The weather is cool, the coffee is strong, and the mostly empty floor is weekend quiet. In other words, it's a perfect atmosphere to have an open conversation about a controversial topic: fracking.

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*Paul doing log analysis to track where the company is fracking their wells using a combination of education and technology.*

“There are 7.5 billion people alive in this world,” Paul says. “We can talk about driving cars, and heating or cooling homes, but that’s only a small part of the discussion. It’s not often that you have to think about the energy demand of 7.5 billion people, but when you dive in, you realize what humankind has done with oil and gas in the last 150 years is remarkable.”

“Think about the massive and complex supply chain needed to grow, process, and transport enough crops and livestock to feed and clothe the world. Oil and gas is integral for that. Think about the amount of steel, glass, concrete, plastic, asphalt, etc. and the number of machines used every day to build and repair our cities – it’s almost incomprehensible but that’s all possible because oil and gas provides the power and source material.”

He goes on to say: “It’s not just agriculture and manufacturing – our hospitals and emergency devices require uninterrupted electricity to keep people alive every second of the day. Right now only oil and gas can fully meet that demand.”

Fracking is controversial, but it needs to be discussed in the context of providing affordable, abundant, and reliable energy and source material.

Paul grew up in the family’s business. He remembers driving bulldozers when he could barely see over the engine hood. He got his CDL at 18, the earliest age allowed, and he loved every part of the business. He chose to attend Allegheny College and majored in Geology and Economics, graduating in 2007, which would turn out to be a groundbreaking year in the energy world.

**“It’s not often that you have to think about the energy demand of 7.5 billion people, but when you dive in, you realize what humankind has done with oil and gas in the last 150 years is remarkable.”**

In the same year, Penn State geology professor Terry Engelder, known as “the Father of the Marcellus Shale,” is credited with doing the first calculations that showed that there were roughly 489 trillion cubic feet of recoverable natural gas in the Marcellus Shale. His calculations, along with technological advances, gave drillers the confidence to give Marcellus a try, and it resulted in one of the largest energy booms in the country’s history.

Oil and gas production has always been part of Pennsylvania’s rich history, but now there was a change and it produced a modern day gold rush. Marcellus Shale was the play and fracking was all the news. The unprecedented growth of the industry brought a lot of good to the area, but

with it came a level of scrutiny over the management of earth’s resources that was also unprecedented. To help, Penn State formed the Marcellus Shale Education and Training Center in October of 2008, providing a variety of resources to PA communities and the oil and gas industry members.

Paul graduated into a world that was hyper-aware of fracking... and many folks were opposed to it. He went straight to work, knowing that his family business was something that not everyone understood or agreed with. “Not everyone wants to have a discussion about fossil fuels or fracking, and that’s OK,” he says. “But when they do, I tell them it’s needed because alternatives are not yet practical. Fracking is a complicated solution to a really complicated problem.”

Let’s say you are one of the people willing to have this discussion. “Fracking is a technological achievement that enables the oil and gas industry to more completely and efficiently extract oil and gas from the subsurface rock and get it to market,” Paul says. “In many ways this industry is like every other – there is a right way to do things and a wrong way to do things. There are companies who have done the wrong thing (whether by accident or not), and they have given the entire industry a black eye. Fracking responsibly, which is what most operators do, is a direct benefit to the enormous effort undertaken every day to provide fundamental human needs to the people in the world. Affordable, abundant, and reliable energy is important, and it matters to people.”

Paul was put in charge of the family operation by the time he was 25.



*Paul maps the sandstone reservoir so they can de-risk their next drill site.*

In the new boom, he chased drilling rigs in Pennsylvania, Ohio, West Virginia, and New York. “I had to be everywhere at once,” he says. He decided his last day at the family business would be the day he married his wife, Hannah. In 2015, when they came back from their honeymoon, he set out to work on his own.

His family’s company worked primarily as a contractor to oil and gas companies, but Paul was ready to move out and work as a producer. He had the skill set, contacts, and background in operations and geology. He thought “the risk of not doing it seemed greater than the risk of doing it and failing.”

**And from generations of hard-working men and women, Blackhawk Energy was formed**

It was a tough start for the new couple. “It was a lot harder to start the company than I thought it would be. It was hard to secure the right acreage. On top of that, we gave up my salary, health insurance, and

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company vehicle. We shared an old car, a lot of student debt, and the promise to make it work – together.”

Late the following year Paul was introduced by a good friend to a petroleum engineer alum from PSU, Larry DeFluri. “Larry and I were both at the right place at the right time and we decided to partner. We founded Blackhawk Energy, LLC because we both wanted to build a first-class oil and gas exploration, development, and production company,” Paul says. “Our partnership works first and foremost because we have the same core values and we agree on our mission and vision.”

He and Hannah drew a circle around their home in McKean County as they looked for a place to live. “We needed a fresh start but wanted to be within a few hours of home because that’s where our family is and that’s where the drilling is – we considered Buffalo and Pittsburgh but, ultimately, we decided on State College,” Paul says. “Hannah had great employment opportunities here and the University was able to provide talent, resources, and support. Generally speaking, State College is a very smart place. The people are optimistic and ambitious and involved. The community is diverse, and we love the hometown feel. We especially appreciate what the area has to offer for kids. We’re here because it’s a great place to raise a family.”

It was a great move.

**“Start-ups require a lot of help and it’s all hands on deck all the time. To have a place that lends a helping hand is invaluable. It’s a resource I certainly don’t take for granted.”**

“I work between two locations that completely complement one another,” Paul says. “On the one hand we have employees, contractors, and suppliers in McKean County where virtuous hard work and natural resource development is part of the fabric of the community. Then, here in State College, I am surrounded by extremely smart administration and an unbelievably supportive community at Innovation Park and the University. Together, it’s a network of people who are really invested in making sure Blackhawk succeeds.”

### Innovating the next chapter in energy

Blackhawk found a home at 200 Technology Center at Innovation Park; it’s been great for the company, Paul says. “The building management and staff truly care about the success of the tenants and they prove it again and again daily. They offer support in the form of affordable office space, business and administrative support and coaching, and for us, they opened up their



*Blackhawk is currently drilling in conventional formations like this sandstone, the darker colored rock in the picture.*



*A rig drilling a Blackhawk well.*

personal Rolodexes to connect us with our banking partners, as well as our first Joint Venture partner (Bulldog Capital Investments of State College) which quite literally moved our company to the next level.”

These personal connections paired with professional support have been crucial in Blackhawk’s growth. “Start-ups require a lot of help,” Paul says, “and it’s all hands on deck all the time. To have a place that lends a helping hand is invaluable. It’s a resource I certainly don’t take for granted.”

Innovation Park Director Dan Leri assisted Paul with settling into the Park and getting connected to the local business owner ecosystem and resources. “The energy sector is an extremely complicated foundational component of our country’s economy,” Dan says. “Complex outcomes, like a long-term energy strategy that needs to evolve toward renewable sources, requires smart young leaders in both fossil fuels and renewables. Give me 50 more people like Paul Morris and we all will feel more confident about a structured, ethical, and environmentally responsible evolution of our energy and lubricant sectors in this country.”

The proximity to the University allows Blackhawk to continue the collaboration that Paul started in 2003. Dr. Bob Watson (Associate Professor Emeritus – Penn State), who has supported Paul’s efforts since he was in high school, and Dr. John Wang, (Associate Professor of Petroleum and Natural Gas Engineering) have worked closely with the company as they discuss projects to evaluate acquisitions, enhance oil and gas recovery methods, and improve drilling and completions techniques. The company has access to Penn State labs and help from undergraduates for various projects, and they in turn have granted the

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University access to their leases so undergraduates in Petroleum and Natural Gas majors can experience hands on education. One recent graduate is completing some post-graduate work before starting full time with Blackhawk. "It's a great community for entrepreneurs, business start-ups, and seasoned professionals to tap into. It's a win/win," Paul says. Dan Leri agrees. He believes the happy collisions of good people are key for young people and new companies to succeed. "Combining the deep craft of seasoned scientists and business talent with the fresh eyes of a hardworking and dedicated talent like Paul greatly increase the chances of business success."

## "You don't have to stand out. You just have to tell the truth and do your job really well."

Being situated close to an epicenter of invention and innovation has other benefits to the company. Paul and his team are in tune with energy innovations as they change, which they're hoping will lead to exciting new opportunities.

"Our mission states that for as long as fossil fuels are needed, Blackhawk Energy will be accountable to the public for responsibly producing oil, gas, and their constituents in order to satisfy those needs," Paul says.

I ask him what makes his company stand out.

"Nothing," he says.

I push back, because what I've heard so far doesn't sound like nothing.

"You don't have to stand out," he says. "You just have to tell the truth and do your job really well."

And that's exactly what he's doing. He's assembled a team from his two talent bases in State College and McKean County. "I knew all I needed were good people and good rock. And now we have both."

When the House is in session in Harrisburg, he drives 90 minutes to have discussions with representatives and leaders who are interested in or curious about responsible fracking and energy production. "Their job is to represent the people of our state in a way that appeals to their voters. It's always good to engage with people on this subject – even those who are ideologically opposed to using fossil fuels. You can go deeper than the manufactured talking points from both sides and end up having a meaningful conversation about the complexity of delivering affordable, abundant, and reliable energy which is vital to survive and thrive. That's a big deal."

When he looks ahead at the next step for the company, his mantra comes back into play. "We just keep doing what we say and saying what we do. We want to keep producing oil and gas in a way that's thoughtful, efficient, and orderly. My bottom-line goal is to create a company that my daughter will be proud of. I want to work with her in the same way I've been able to work with

my dad. I want her to work with her grandpa just like I was able to do. That will happen by maintaining high standards."

He hopes to pair Blackhawk's expertise, capital, and geologic prospects with like-minded partners and investors who are interested in responsibly and economically developing our natural resources.

Until then, it's business as usual for Blackhawk, which last week included bringing brand new wells on-line and helping the PA DEP in fixing an old abandoned well that someone else drilled many decades ago. Paul simply puts it, "We're here to do our part in cleaning up the past and providing oil and gas for the future."

Leri finds great encouragement in the Blackhawk team. "We have a large variety of companies at Innovation Park. It's exciting to have an energy related start-up with a team of dedicated people who are just fine working to live extraordinarily ordinary lives while providing a necessity for our communities and for our country."

## "We live here, we work here, we send our kids to school here. We know that producing oil and gas is a huge concern... and that's why we're here, to be responsible and accountable."

Paul simply wants people to stop and think honestly what his industry means to them in their daily lives. "Right now fossil fuels are core to your life and mine, and as long as that's the case, we are going to work hard for you in that space. Accountability and responsibility are very real things to us. Knowing that, who do you want bringing this energy to you – a company you can get to know or a company you'll never get to know? We live here, we work here, we send our kids to school here. We know that producing oil and gas is a huge concern and that's why we're here, to be responsible and accountable – it's who we are." ■

### THE MORRIS FAMILY'S OIL & GAS LEGACY: 100 YEARS IN THE MAKING

**Generation 1:** In the early 1920's Charles (C.J.) Morris Oil and Gas Field Hauling was established to mobilize and de-mobilize standard drilling rigs around the Bradford, Pennsylvania oil fields using teams of horses.

**Generation 2:** By 1957, C.J. Morris Oil and Gas Field Hauling became C.J. Morris & Sons. C.J. Morris & Son's led by Thomas J. Morris acquired Cable Tool Drilling Rigs and started drilling wells for others and for themselves.

**Generation 3:** In 1979, advancements in drilling rig technology coincided with the incorporation of Dallas-Morris Drilling, Inc. Under the direction of Thomas J. Morris Jr., Vice President, DMD, expanded its footprint throughout the Appalachian Basin and opened an office

in Indiana, PA where it could offer deeper vertical and horizontal drilling capabilities.

**Generation 4:** In 2007, as a result of record high oil prices Dallas-Morris Well Service, LLC - a shallow pressure pumping company was formed. As Managing Partner, Paul Morris and his cousin had now successfully established the Morris Family as a fourth generation family owned and operated vertically integrated company.

The Morris Family of companies continues to operate

a transportation fleet for rig moving, equipment hauling, and water transportation, all of which support its ongoing drilling, fracking, cementing, and service operations.

### Continuing The Legacy - BLACKHAWK ENERGY, LLC:

By 2016 Paul T. Morris and Larry J. DeFluri had partnered and acquired oil and gas minerals and leasehold acreage from which, Blackhawk Energy, LLC was formed - beginning a new chapter in a storied tradition.

HAPPY VALLEY

# Startup Resource Guide

To learn more visit [resourcenavigator.psu.edu](http://resourcenavigator.psu.edu)

60 resources that support community entrepreneurs, students, faculty and industry

## Startup Resource Providers

Provider	Description	Primary User					Resources											Cost
		Community Entrepreneurs	PSU Faculty & Postdocs	PSU Graduate Students	PSU Undergraduate Students	Industry	Classes & Workshops	Accelerator Program	Mentors / Advisors / Experts	Funding / Assistance	Pitch Competition	Community Building	Subsidized Leasable Space	Co-Living Space	Coworking Space	Maker Space / Prototyping		
<b>1855 Capital</b> 1855capital.com	Seed and early-stage venture fund with an emphasis on Penn State affiliated startups	●	●	●	●				●	●								Equity
<b>3 Dots</b> 3dotsdowntown.com	Vibrant downtown space hosting artistic and innovative experiences with a focus on community building	●	●	●	●		●					●					●	Low-cost
<b>Ag Springboard Competition</b> agsci.psu.edu/entrepreneur/competitions/springboard	An annual business pitch competition open to all students at Penn State—\$7,500 grand prize			●	●				●	●	●	●						Free
<b>Applied Professional Experience (APEX) Program</b> smeal.psu.edu/apex	Students from Smeal's Sapphire Leadership Academic Program analyze and help solve a client's business problem or challenge	●	●	●	●	●			●									Free
<b>Arts Business Idea Competition</b> artsandarchitecture.psu.edu/content/arts-business-idea-competition-guidelines-and-application	Arts entrepreneurship pitch competition for arts-related businesses or non-profit organizations—\$10,000 in awards			●	●						●							Free
<b>Ben Franklin Technology Partners</b> cnp.benfranklin.org	Direct funding, business assistance and networking for early-stage and established technology companies	●	●			●	●		●	●								Loans
<b>Ben Franklin Technology Partners Big Idea Contest</b> bigidea.benfranklin.org	Pitch contest with a prize package of up to \$50,00, plus business support services	●	●	●	●					●	●							Free
<b>Central PA SCORE</b> centralpa.score.org	Non-profit organization providing confidential mentoring services to small businesses	●	●		●		●		●									Free or Low-cost
<b>Centre Region Entrepreneur Network (CREN)</b> Facebook.com/CRENetwork	A place for Central PA entrepreneurs to connect with peers to discuss successes and difficulties of running a business	●	●	●	●							●						Free
<b>Chamber of Business &amp; Industry Centre County (CBICC)</b> cbicc.org	Networking opportunities and funding assistance for local businesses	●				●				●			●					Annual Fee
<b>CommAgency</b> bellisario.psu.edu/commagency	A student-run media production agency offering video, photography, strategy, and branded content creation	●	●	●	●				●									Low-cost
<b>Corporate Engagement Center (CEC)</b> corporateengagementcenter.psu.edu	Concierge for Penn State corporate partners and stakeholders to foster collaborations to drive business innovation, provide executive education and secure talent to address global problems					●			●									n/a
<b>Corporate Innovation and Entrepreneurship (CIENT) Major</b> undergrad.smeal.psu.edu/majors/corporate-innovation-and-entrepreneurship	Designed for students interested in managing corporate innovation or starting a business				●		●						●					Tuition

# Startup Resource Providers

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		Community Entrepreneurs	PSU Faculty & Postdocs	PSU Graduate Students	PSU Undergraduate Students	Industry	Classes & Workshops	Accelerator Program	Mentors / Advisors / Experts	Funding / Assistance	Pitch Competition	Community Building	Subsidized / Leasable Space	Co-Living Space	Coworking Space	Maker Space / Prototyping							
<b>Corporate Innovation and Entrepreneurship Society (CIES)</b> ciespsu.wixsite.com/cies	Networking groups for students interested in corporate innovation and entrepreneurship			●			●																Free
<b>David Rusenko Emerging Entrepreneur Scholarship</b> sites.ist.psu.edu/scholarships/entrepreneur-in-residence-scholarship	For full-time College of IST freshmen or sophomores interested in innovation and entrepreneurship--provides up to \$5,000 for one year			●					●														Free
<b>David Rusenko Entrepreneur in Residence Scholarship</b> enr.psu.edu/research-administration/internal-funding-initiatives.aspx	For full-time College of IST juniors or seniors with entrepreneurial experience--provides up to \$10,000 for one year, up to six academic credits, and a faculty mentor			●						●													Free
<b>Engineering for Innovation &amp; Entrepreneurship (ENGINE) Grants</b> enr.psu.edu/research-administration/internal-funding-initiatives.aspx	Provides financial support to transition early-stage technology from research through proof of concept phase to form a startup company		●	●					●	●													Free
<b>Entrepreneurship &amp; Innovation (ENTI) Minor</b> enti.psu.edu	Teaches students foundational skills to succeed as future entrepreneurs and intrapreneurs			●			●																Tuition
<b>Entrepreneurship and Innovation Toolkit</b> guides.libraries.psu.edu/entrepreneurship	Digital toolkit offered by the Penn State University Libraries, highlighting resources for company, market, industry, and business planning research	●	●	●	●		●																Free
<b>Farrell Center for Corporate Innovation and Entrepreneurship</b> smeal.psu.edu/fcfe	Cultivates industry partnerships to benefit companies, students, and faculty by providing engaging educational opportunities, research initiatives, consulting programs, events, and more	●	●	●	●		●																
<b>Fund for Innovation</b> fundforinnovation.psu.edu	Awards \$25,000-75,000 to de-risk and develop Penn State technologies with commercial promise through a matching program with academic colleges		●						●	●													Free
<b>Garber Venture Fund</b> smeal.psu.edu/garber	Penn State student-run investment fund with an emphasis on Penn State-affiliated startups	●	●	●						●													Equity
<b>Global Entrepreneurship Week</b> gew.psu.edu	Annual event celebrating relationships between members of the university and local entrepreneurial communities	●	●	●	●		●																Free
<b>Global Legal Hackathon</b> pennstatelaw.psu.edu/events/globallegal-hackathon	Worldwide initiative challenging students and legal professionals to rapidly develop tech solutions to improve the practice of law and access to legal services			●	●																		Free
<b>Happy Valley LaunchBox powered by PNC Bank</b> launchbox.psu.edu	Startup accelerator & coworking space, plus hot desks and legal and IP advice, with free Wi-Fi and coffee	●	●	●	●		●	●	●	●										●			Free
<b>Happy Valley Capital</b> happyvalleycapital.com	Student-run venture capital fund, promotes innovation and entrepreneurship while giving students the opportunity to learn more about the inner-workings of the industry			●																			Free
<b>IdeaMakers Challenge</b> ideamakers.ist.psu.edu	University-wide challenge mentoring students to pitch their early-stage entrepreneurial ideas to a panel of industry experts			●					●														Free
<b>Inc. U Competition</b> pennnap.psu.edu	Pitch competition for student startups from any Penn State campus. Semi-finalists compete on "The Investment" WPSU TV show and win up to \$30,000 in funding			●					●	●	●												Free
<b>Innoblue</b> innoblue.org	A Penn State club where students connect, brainstorm projects, and build businesses			●			●																Free
<b>Innovation Gateway</b> innovation.psu.edu	Connects industry and Penn State researchers to solve technical challenges and needs of industry		●			●			●														n/a

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<b>Innovation Partnership</b> innovationpartnership.net	Provides early-stage technology companies free proposal writing assistance, training, and financial assistance	●	●	●	●		●		●	●												Free
<b>Invent Penn State</b> invent.psu.edu	Connects and provides programs, events, tools and support for entrepreneurs and industry	●	●	●	●	●	●	●	●	●	●	●	●					●				Free
<b>Invent Penn State Venture &amp; IP Conference</b> invent.psu.edu	Matches startups with VC funding and showcases Penn State emerging technologies	●	●	●	●	●	●			●	●	●										Fee
<b>Lab Bench to Commercialization Grant</b> innovation.science.psu.edu/faculty	Grant program to advance commercially promising technologies in the Eberly College of Science		●	●					●	●												Free
<b>Lion LaunchPad</b> lionlaunchpad.psu.edu	Special living option with tailored programs to help student entrepreneurs turn innovative product and service concepts into viable startup companies				●		●		●			●			●					●		Fee
<b>mHealth Challenge</b> mhealthpennstate.weebly.com	Brings nursing students together with students from other disciplines to solve complex health challenges through technology				●															●		Free
<b>New Leaf Initiative</b> newleafinitiative.com	Low-cost hot desk and coworking space with programs, events and workshops	●	●	●	●		●					●							●			Fee
<b>Nittany AI Challenge</b> challenge.nittanyai.psu.edu	Students teams compete for grants by developing and presenting AI-based solutions for real-world problems				●			●	●	●												Free
<b>NSF I-Corps Site</b> invent.psu.edu/program/nsf-i-corps-site	Provides microgrants and accelerator program for up to 30 faculty affiliated startups each year	●	●	●	●		●	●	●	●									●			Free
<b>Penn State's Office of Entrepreneurship and Commercialization (OEC)</b> invent.psu.edu	Manages Penn State's startup pipeline, economic development programs and storytelling for entrepreneurship & innovation	●	●	●	●	●	●	●	●	●	●	●	●						●			Free
<b>Penn State's Office of Industrial Partnerships (OIP)</b> research.psu.edu/oip	Matches Penn State researchers with industry challenges to create sponsored research opportunities		●			●			●	●												Free
<b>Penn State's Office of Technology Management (OTM)</b> research.psu.edu/otm	Manages intellectual property derived from Penn State research and assists faculty with the patenting and commercialization process and paying up-front patenting expenses		●			●			●													Free
<b>Patent and Trademark Resource Center</b> guides.libraries.psu.edu	Helps locate patent and trademark information and file with the United States Patent and Trade Office	●	●	●	●		●		●													Free
<b>Penn State's Humanitarian Engineering &amp; Social Entrepreneurship (HESE) Program</b> sites.psu.edu/hese	A class-based program for students of any major to create and launch ventures and work on publishable research based on an evidence and data-driven approach				●		●		●													Tuition
<b>Penn State Incubator</b> innovationpark.psu.edu	Low-cost wet lab and light manufacturing space, co-located with 30+ tech startups, business advisors and resource in Innovation Park	●	●						●				●	●								Low-cost Lease
<b>Penn State Law Entrepreneur Assistance Clinic</b> pennstatelaw.psu.edu/practice-skills/clinics/entrepreneur-assistance-clinic	Provides legal advice to startups on entity formation and equity agreements. Provides intellectual property advice	●	●	●	●				●													Free
<b>Penn State Law Intellectual Property Clinic</b> pennstatelaw.psu.edu/practice-skills/clinics/intellectual-property-clinic/ip-clinic-client-application	Provides intellectual property counseling services to individuals, startups, and small businesses with limited financial resources	●	●	●	●				●													Free
<b>Penn State Small Business Development Center (SBDC)</b> sbdc.psu.edu	No-cost, confidential consulting services and seminars for small businesses and individuals considering starting a business.	●	●	●	●		●		●	●												Free

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		Community Entrepreneurs	PSU Faculty & Postdocs	PSU Graduate Students	PSU Undergraduate Students	Industry	Classes & Workshops	Accelerator Program	Mentors / Advisors / Experts	Funding / Assistance	Pitch Competition	Community Building	Subsidized / Leasable Space	Co-Living Space	Coworking Space	Maker Space / Prototyping		
<b>Penn State Startup Week</b> startupweek.psu.edu	Annual Penn State-wide student event featuring networking events, student pitch competitions, and talks from successful entrepreneurs, intrapreneurs and social innovators			●	●		●											Free
<b>Penn State University Libraries</b> libraries.psu.edu	Support for entrepreneurship curricular driven projects, assignments and research		●	●	●		●											Free
<b>Pennsylvania Technical Assistance Program (PennTAP)</b> pennnap.psu.edu	Statewide program helping organizations maximize competitiveness through in person consultations, unbiased technical advice, and connections to Penn State experts, resources, and programs	●			●	●			●	●	●							Free
<b>RAIN Grant Program</b> agsci.psu.edu/research/resources/funding/rain-grants-program	Assists College of Agricultural Sciences researchers in commercializing technologies derived from their research		●	●					●	●								Free
<b>Startup Leadership Network</b> invent.psu.edu/contact	Invitation-only membership group matching Penn State tech startups with seasoned executives to accelerate market entry		●	●		●				●								n/a
<b>Student Engagement Network</b> engage.psu.edu	Comprehensive initiative connecting students with hands-on curricular and cocurricular opportunities across Penn State		●	●	●												●	Tuition
<b>Summer Founders Program</b> invent.psu.edu/program/summer-founders	Gives Penn State student teams \$10,000 each to work on their startup, social good, or non-profit idea for the summer			●	●			●	●	●							●	Free
<b>TechCelerator @ State College</b> techceleratorstatecollege.org	10-week accelerator held twice a year with mentorship and opportunities for Ben Franklin Technology Partners funding	●	●		●			●	●	●	●							Free
<b>The Bernard M. Gordon Learning Factory</b> lf.psu.edu	Provides modern design, prototyping, and manufacturing facilities, including machining (CNC and manual), 3D printing, welding, metrology, and CAD/CAM			●	●	●	●			●							●	Tuition
<b>The Co.Space</b> thecospace.com	A top ranked housing option in State College for driven students and young professional changemakers	●		●	●			●					●					Lease
<b>The Rivet</b> therivet.org	Makerspace with classrooms, a studio, and a meeting place aimed at connecting people to what they need to make anything	●	●	●	●			●									●	Low-cost
<b>The School of Engineering Design, Technology, and Professional Programs (SEDAPP)</b> sedtapp.psu.edu	Partners faculty, students, and industry to solve real-life engineering problems through active, collaborative, project-based, and professionally oriented classroom experience			●	●	●	●			●								Tuition



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- entrepreneur.com

Learn more about startup resources in Happy Valley by visiting [resourcenavigator.psu.edu](http://resourcenavigator.psu.edu)

# VENTURE CONNECTION

Venture Connection is the event at the center of the Invent Penn State Venture & IP Conference. In this exciting format, investors host tables to meet with groups of entrepreneurs that have been matched with them based on capital needs, industry and other key criteria. Each session is broken into 20-minute segments, giving each investor the chance to meet with up to 36 capital-seeking, well-screened entrepreneurs.

**Entrepreneurs do not need to be Penn State affiliated**, but have applied to participate in Venture Connection. These applications were reviewed by a Selection Committee to ensure that Venture Connection will be a quality showcase of promising technology ventures.

Entrepreneurs give an elevator pitch to the investors. Investors will then share more about what they look for in prospects and discuss their respective funds and investment strategies. If there is a connection, private one-on-one meetings are scheduled.



## tech|TOURNAMENT

### Tech Tournament

The Tech Tournament is a competition showcasing Penn State's top innovations and most disruptive technologies. Entrepreneurs will compete for \$160,000 in prizes. Last year's winners were

- 1st place and \$75,000 - Phospholutions for its granular soil amendment that reduces phosphorous runoff and enhances plant growth.
- 2nd place and \$50,000 - Thoracicair for a device used to enhance natural breathing in infants in respiratory distress without the need for invasive ventilation devices.
- 3rd place and \$25,000 - Aleo BME Inc. for their biodegradable adhesive that addresses unmet needs in surgical adhesives and sealants.
- People's Choice Award, and \$10,000 cash prize, - ConidioTec, LLC for a highly effective bio fungal-pesticide that targets and kills bedbugs.

### Penn State Student Startup Showcase

Startup founders from Penn State's top pitch competitions, including the Inc.U Competition and Summer Founders Program, will give a one-minute sling pitch at the opening of the conference and receive microgrants presented by President Barron.

## Venture & IP Conference

October 3 & 4, 2019 | The Penn Stater Hotel & Conference Center

*Tentative agenda. Subject to change.*

### Thursday, October 3rd

**8:00 – 6:00 pm**  
**General Registration**

**9:00 – 10:30 am**  
**Tours:** College of Agricultural Science VIP Tour or Happy Valley LaunchBox Powered by PNC Bank and 3 Dots Tour, and New Leaf Initiative

**11:00 am**  
Exhibits Open

**11:00 – 12:30 pm**  
**Luncheon**  
Keynote: Dr. Eric J. Barron, President of Penn State Penn State Student Startup Showcase

**12:45 – 3:00 pm**  
**venture Connection**

For pre-selected entrepreneurs & investors

**12:45 – 1:45 pm**  
**Session #1:** Advancing Diversity through Tech-Enabled Ventures

**2:00 – 2:45 pm**  
**Session #2:** Unicorns vs Zebras: Alternatives to the Traditional Venture Capital Model

**3:00 – 5:30 pm**  
**tech|TOURNAMENT**

**Penn State Tech Tournament**

**5:30 – 11:00 pm**  
Courtesy shuttles to and from The Penn Stater to Reception

**6:00 – 8:30 pm**  
**Off-Site Reception**  
Federal Taphouse

**8:30 – 10:00 pm**  
**After Party**  
Federal Taphouse

# Keynote Speakers

## Anna Mason, Revolutions Rise of the Rest Seed Fund

7:30-8:45 AM, Friday, October 4 - Breakfast & Keynote

Anna Mason is a Partner on Revolution's Rise of the Rest Seed Fund. In this capacity, she leads the investment process for select deals in the fund across a variety of industries including the fund's investments into Summersalt (St. Louis, MO), Pryon (Raleigh, NC), Stord (Atlanta, GA), Dispatch (Minneapolis, MN), and Collective Retreats (Denver, CO). Anna also leads strategy and execution for the Rise of the Rest Network and Platform, including the annual Rise of the Rest Road Trip and annual Network Summit. Her passion for this work is centered around two core beliefs: investing in startups sits at the intersection of realism and optimism; Rise of the Rest is a platform that helps us see the country through the eyes of the entrepreneurs reimagining its future.



Anna brings over 10 years of experience in finance, startup operations, and venture community programming to Revolution. Prior to joining Revolution, she co-founded a fitness-community app that was acquired by Beachbody in 2015. Before that, she began her career on Wall Street, where she spent seven years as a distressed bond and private equity trader, most recently as a Vice President at The Seaport Group.

Anna has a passion for early stage startups, and since November 2015, she has volunteered as the co-director of the Washington Chapter of The Vinetta Project, a North American organization that helps early-stage female founders in tech access capital and network connections. She is also on the advisory board of BEACON DC, a community-led campaign to make Washington, D.C. one of the most influential and supportive cities in the country for women entrepreneurs.

Anna received her BA in Government from Harvard College and her MBA from the NYU Stern School of Business. Anna is also a certified health coach. She serves on the Board of Trustees of the National Children's Museum in Washington, D.C.

## Bruce Booth, Atlas Venture

12:30-2:30 PM, Friday, October 4 - Lunch & Keynote

Bruce Booth is a partner at Atlas Venture and focuses on the discovery and development of novel medicines and therapeutic platforms.

Bruce is currently chairman of AvroBio (NASDAQ:AVRO), Kymera Therapeutics, Hotspot Therapeutics, Nimbus Therapeutics, Rodin Therapeutics, and Unum Therapeutics (NASDAQ:UMRX), and also serves on the boards of Lysosomal Therapeutics and Magenta Therapeutics (NASDAQ:MGTA). He previously served on the boards of past Atlas companies Avila (acquired by Celgene), Padlock (acquired by BMS), Prestwick (acquired by Biovail), Stromedix (acquired by Biogen), Zafgen (NASDAQ:ZFGN), and a number of other ventures.



Bruce serves as an advisor in various capacities to UCB, Takeda, and the Gates Foundation. He also serves on the boards of the National Venture Capital Association, the Pennsylvania State Research Foundation, and New England Disabled Sports, a charity dedicated to adaptive sports. Bruce blogs about biotech and venture capital topics at LifeSciVC.com, which is syndicated on Forbes.

Prior to joining Atlas in 2005, Bruce was a consultant at McKinsey & Company and an investor for Caxton Health Holdings. As a British Marshall Scholar, Bruce received a D.Phil. (PhD) in molecular immunology from Oxford University. He received a BS in biochemistry, *summa cum laude*, from Penn State University.

Bruce enjoys running, skiing, hiking, and fly fishing. He lives in Wellesley, MA and has three wonderful kids.

# Venture & IP Conference

October 3 & 4, 2019 | The Penn Stater Hotel & Conference Center

Tentative agenda. Subject to change.

## Friday, October 4th

7:00 am – 2:30 pm  
Registration & Exhibits Open

7:30 – 8:45 am  
Breakfast & Keynote:  
Anna Mason, Revolutions Rise  
of the Rest Seed Fund

9:00 – 11:00 am  
venture Connection  
For pre-selected entrepreneurs  
& investors

9:00 – 9:45 am  
Session #3: Understanding  
the Venture Capital Investor

10:00 – 10:45 am  
Session #4: Tales from The  
Road: The Entrepreneurs  
Perspective on Raising Money

10:45 – 11:30 am  
Session #5: IP 101 – What  
Every Startup Needs to Know  
About IP Protection

11:30 am – 12:15 pm  
Session #6: Venture Capital  
101

11:30 am – 12:15 pm  
Session #7: The Art & Science  
of the Deal - Getting Funded Now

12:30 – 2:30 pm  
Lunch, Awards Ceremony,  
Closing Remarks  
A Memorial Tribute to Peter  
S. Linder: Former Chairman of

the Board for the Penn State  
Research Foundation  
Keynote: Bruce Booth, Atlas  
Ventures



# NEUEXCELL'S GROUNDBREAKING BRAIN REPAIR TECHNOLOGY COULD RESTORE HOPE AND QUALITY OF LIFE FOR MILLIONS

## Strangers in a strange land

Picture it: a spaceship lands on Earth, opens, and an alien steps out. The alien has a mission – to assimilate and fit in anywhere he goes (US, Russia, China), immediately. Eat what we eat, speak our language, become part of a human family, instantly. No learning curve, no practicing, no time to acclimate to his surroundings. Become human or die. His surviving chances are slim to none.

While this story is science fiction, it's how Gong Chen, founder of NeuExcell, explains a very real process by which some researchers are attempting to use external stem cell injections to repair brain damage, and why he believes it's the wrong approach.

"The stem cells are strangers in a strange land after being injected into an adult mammalian brain," he says. He points a finger at me. "It's like asking you to get on a plane this afternoon and land in China and instantly speak Mandarin fluently, instantly make a home and family and friends, and launch a successful career. It's not realistic."

"Let's take a really low number," Chen goes on. "Let's say that 5% of one patient brain has been affected by Alzheimer's. That's four billion neurons. Using the high limit of a 10% survival rate for stem cells (remember the alien who probably won't make it) and we are at 40 billion cells that would need to be injected – about half of total the neuronal cells in the brain. Let's do the math and really think it through quantitatively... it's just not realistic."



*Dr. Gong Chen explains some of NeuExcell's in vivo neuroregeneration research.*

## Neighbor (cells) helping neighbor (cells)

So, forget about our alien friend from outer space. Now, simply picture that a local person steps up to fill the vacant position instead. They've always lived there together, already speak the same language, and already have a support system of family and friends. They even have connections in ancestral lineages. Asking a neighbor to help is far more convenient than asking for help from a Martian.

This is the model NeuExcell is using to repair damaged brains. Gong Chen explains why it offers a better chance of success.

Every neuron in our brain is surrounded by a group of supporting cells called glial cells. When a person suffers from neurodegenerative disease like ALS or Alzheimer's, or suffers a neural injury like stroke, neurons are injured or die. While neurons cannot replicate themselves, their neighboring glial cells can.

As soon as a neuron dies or is damaged, the neighboring glial cell become reactive and proliferate by replicating itself to fill in the gap. NeuExcell is working on a new technology that converts these reactive glial cells into functional neurons.

When a person leaves his job, for example, rather than introducing someone who has never worked in that field, the position is filled by someone with experience at a neighboring desk. "We aren't introducing aliens," Chen says. "We are using neighbors and friends to fill in for the damaged neurons."

## The power to heal has potential to disrupt the healthcare landscape

To say that this technology has the potential to change the world is not an exaggeration. Imagine slowing the progress of Alzheimer's, returning mobility to stroke victims, and restoring quality of life to someone who has suffered a concussion brain injury. It's big.

Neurological disorders such as stroke, Alzheimer's disease, Parkinson's disease, Huntington's disease, Amyotrophic Lateral Sclerosis (ALS), and spinal cord injuries have inflicted millions of patients in U.S. and even more worldwide. In fact, stroke is the leading cause of long-term disability in U.S., with nearly 800,000 people experiencing a stroke each year, and totaling 7 million stroke survivors. Alzheimer's disease now affects 5.7 million patients in U.S. and the number is growing.

The medical and financial burdens are extraordinary, not only to the families, but also to the society – the annual cost to care for Alzheimer's patients in America is projected to be over one trillion dollars by 2050.

## Finding and funding success

In 2010, Penn State Professor and Verne M. Willaman Chair in Life Sciences Dr. Gong Chen and his team started working on in vivo neuroregeneration. Research moved quickly, and by 2012, they had filed the first patent for the technology, and obtained the issued patent on NeuroD1 in 2017 by USPTO.

They published their first paper on in vivo conversion of glial cells into functional neurons in mouse model with Alzheimer's disease in the end of 2013. The success attracted a lot of media attention and exposure in many scientific journals. Recently, their further work on stroke brain repair has been accepted for publication in the journal of Molecule Therapy.

In their documentation, they were able to show 90% conversion efficiency, the highest in the world. Even better than that conversion rate is

CONTINUED ON NEXT PAGE

the fact that glial cells can divide and replace themselves, providing an endless reservoir that can never be depleted. In preclinical studies, Chen's team has demonstrated success in a stroke model where up to 80% of ischemic injured neural tissue was repaired and motor function and cognitive deficits significantly rescued.

In 2015, the Skip Smith family made a donation of \$5 million dollars, making a huge impact on the study. After the Smith's donation, angel fund money was invested into the company, providing them with the money to establish its own lab and office space independent of the university lab. They made the move to Innovation Park's Technology Center Incubator. "It's very convenient to have the company so close to my office at Penn State," Chen says.

NeuExcell is a testament to President Barron's commitment to entrepreneurship to have this resource available within the Penn State family. "He is very supportive and encouraging of faculty to start companies," Chen says. "It's very important that professors don't just do mechanistic research, but that they actually also DO the translational work."

## New space, new talent, major progress

Since 2015, with limited angel investment resources, the company has been moving forward, and recently that pace has dramatically accelerated. Just this summer, NeuExcell added Executive Board Chair and Acting CEO Peter Tombros. Tombros helped build Pfizer's pharmaceutical business from 1968 to 1994, served for eight years as CEO of Enzon, then as CEO and Chairman of the Board of VivoQuest, a private start-up drug discovery company, until 2005. A Penn State alumnus, he has had long-time involvement with Penn State's Eberly College of Science and Hershey Medical Center. In 2006, Peter was selected for Penn State's highest honor, the Distinguished Alumnus Award.

Joining Tombros on the board is Amsterdam Molecular Therapeutics (AMT) founding CEO Ronald Lorijn. Lorijn's company AMT was responsible for bringing Glybera, the first recognized gene therapy product in the world, to the global market.

Chen notes that the transition from lab work to a therapy is a long journey. Once a company is running and has licensed a patent through Penn State, Penn State employees are not allowed to use Penn State resources to benefit the company in the most practical and scientifically efficient manner due to federal regulations. Instead, Dr. Chen has been instructed to use outside labs for testing and verification, at much higher costs. "I do wish it were more synergistic, and I hope over time we improve the interactions between the university and the spinoff companies to facilitate the technology translation," Chen says.

Right now, a research lab of 40 people is conducting tests on mice here in Happy Valley, and a lab



in China is conducting translational research in primates. The primate research, Chen says, is critically important, explaining that "a monkey brain is much bigger than a mouse brain. It's closer to a human brain. We'll never inject a human brain until we have big success in primates."

## The road to the marketplace

For the next two years, the company is in advanced R&D stage, which will entail investigational new drug (IND) enabling studies. After that time, they anticipate two years in Phase One, which will allow for FDA-approved human clinical trials. Once they can document positive effect in human clinical trials, it's on to Phase II and Phase III, and then the marketplace.

While they are testing in vivo direct reprogramming of glial cells into neurons using AAV-based gene therapy, they are also testing an oral drug that would target widespread neuron loss, and are also working on a drug that would effectively treat neonatal epilepsy.

The big goal? NeuExcell wants to bring hope to millions of patients by transforming billions of glial cells into neurons to treat stroke, Alzheimer's disease, Parkinson's disease, Huntington's disease, and many more. ■

## GAME-CHANGING DONATION ILLUSTRATES PHILANTHROPIC TREND IN MEDICAL RESEARCH

If you compare Gong Chen's research into treatments for brain trauma patients to a smoldering campfire, then Charles "Skip" Smith's \$5 million donation was a jolt of kerosene. In 2015, Chen benefited from a growing trend in scientific research—private contributions. A 1948 Penn State alumnus, Smith was motivated to help Chen propel his research and shorten the timeline for developing a treatment for neurodegenerative diseases like Alzheimer's to within ten years. In turn, Chen was able to license



more advanced intellectual property into a start-up company, NeuExcell, to pursue commercialization. The company has lab space in the Technology Center business incubator at Innovation Park. In 2015, the Chronicle of Philanthropy reported that private philanthropy was beginning to fill gaps left by stagnant or declining federal funding for scientific research. Although not a replacement for federal dollars, private funds offer researchers certain advantages:

Like Smith's gift to Chen, a large infusion of cash can jump-start a project that may have been chugging along and significantly increase its pace.

Private donations also make it easier for researchers to conduct work internationally, while federal grants would bring restrictive limitations for researching overseas. Part of Smith's gift helped Chen advance his research in China.

Most public funding has limitations. Private donations allow for a broader use of funds that compliment public funding.

Overall, philanthropic support for research leans heavily toward the medical field and, like Smith's donation, is typically aimed at developing treatments or cures at a more rapid pace. Donors are often motivated by a personal experience with a specific medical condition, like MBI-Founder Ted Stanley who contributed \$650 million to the Broad Institute to fund research into the connections between genetics and severe mental illness. Stanley said his gift was driven by watching his son, Jonathan, suffer from bipolar disorder.



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3 Dots

Happy Valley  
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PNC Bank  
New Leaf  
Initiatives

Millbrook Marsh  
Nature Center

# WELCOME TO HAPPY VALLEY

Areas in **BLUE** are locations for Venture & IP Conference activities; Areas in **ORANGE** are great spots to visit.

Map courtesy Penn State University [www.map.psu.edu/](http://www.map.psu.edu/)

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