



UIDPVIRTUAL 2024 REPORT

December 5-7, 2023

Presented by



Strengthening
University-Industry
Partnerships



UIDPVirtual 2023 convened 460 registrants representing 95 organizations and brought insight into the timely topics in university-industry collaboration. Participants took part in “deep dive” sessions to develop and amplify key learnings on daily themes. With topics intentionally curated for professionals in contracting, partnership management and research administration, government engagement and economic development, and workforce management, a wide range of university-industry partnership roles found fresh perspectives and new approaches for their day jobs through UIDPVirtual.

Daily thematic topics were:

- Tuesday: Impact of Partnerships on Innovation Ecosystems
- Wednesday: Talent Exchange
- Thursday: International Partnerships

UIDP was fortunate to secure the services of 45 subject matter experts as presenters and speakers. Live presentations have been completed, and conference attendees can download materials and watch session recordings 24/7—whenever it is convenient for them.

Session Highlights

Assessing and Supporting Innovation Ecosystems: Lessons Learned and New Directions

Moderator: Anthony Boccanfuso, UIDP

Speakers: Kristen Sproat, Boston Consulting Group; Emily Knight, The Engine Accelerator

In today's rapidly evolving business landscape, innovation ecosystems have emerged as a driving force for economic growth and competitiveness. The success of these ecosystems is not guaranteed, however, and understanding how to assess their effectiveness is crucial to maintaining strong and productive partnerships. In this panel, attendees gained insights from the Boston Consulting Group (BCG) and the Engine Accelerator on what innovation ecosystems entail, strategies for bringing disparate groups to the table, and the essential metrics that enable organizations to gauge performance and success.

Key Takeaways:

- **Ecosystems allow the six enablers to flourish.** The six enablers, defined as research, funding and investment, talent and culture, infrastructure and data, networks, and community, help innovators commercialize and scale.
- **Continuously ask, “How might we?”** Consider where resources already exist to be efficient and operate at speed. Always ask different organizations *how* you can work together. Relationships that may be initially hard to define can turn into something beneficial.
- **Half of ecosystems fail due to a lack of governance.** Internal structure is key to an ecosystem's success. This can be achieved by having a central body that governs decisions, directions, and funding while being adaptive and willing to solve hard issues.

Advanced Research Projects Agencies (ARPAs)

Facilitators: Chris Atkinson, ARPA-I; Laurent Pilon, ARPA-E

With a model pioneered by DARPA and ARPA-E, advanced research project agencies fund high-risk, high-reward next-generation technologies. Agencies that follow this model use a flexible, nimble strategy regardless of potential failure to drive meaningful research breakthroughs that will affect large-scale societal change. With the advent of ARPAs to address crucial gaps in the research landscape, universities and companies may wonder what to expect. Attendees joined this session for insights into partnership opportunities and funding expectations.

Key Takeaways:

- **High-risk research yields high rewards.** ARPA programs are responsive to the challenges of the country. High-risk research can yield high rewards. Taking risks is not only encouraged in these agencies, but required for the agency's success.

- **Safety is key.** Safety underpins all research applications, as the primary goal is to create infrastructure that is safe, resilient, and sustainable over the long term.
- **Emerging and disruptive technologies drive the process.** Innovations in infrastructure safety and energy efficiency are supported by new and emerging technologies. There is a continuous and structured emphasis on tech-to-market transitions.

National Labs

Facilitators: Leah Chapman, National Physical Laboratory; LaRico Treadwell, Sandia National Laboratories

From their tremendous resources to their emphasis on translating basic science into innovative products, materials, and processes, national labs are ideal partners for universities and companies. UIDP has worked with diverse national labs to answer member questions on leveraging lab talent to benefit students, partnering to bolster economic development, and collaborating to advance innovative research goals. This session explored how partnering with national labs is changing and shared insights into best practices.

Key Takeaways:

- **Cultivate the power of three.** In the UK, the National Physical Laboratory, industry, and academia collaborate to conduct case studies that benefit the nation's economy. Collaboration between all three sectors can help build mutually beneficial relationships that cultivate a strong workforce, facilitate access to talent, and render services in the national interest.
- **Language barriers are a key challenge when collaborating with national labs.** Organizations often speak their own language, which can easily be misconstrued when working across sectors. Learning your potential partner's language can help to pinpoint their priorities and understand the bigger research collaboration picture.
- **Managing expectations is necessary to build partnerships.** Capacity varies from institution to institution, and taking into consideration levels of engagement, equipment, and goals can help support informed decisions about potential partnerships.

State and Local Governments

Facilitator: Judith Sheft, New Jersey Commission on Science, Innovation and Technology

As economic development plays an increasing role in research funding programs, practitioners at the university-industry interface see the importance of not only federal relations but also state and local government partnerships. Involvement with state and local governments is important for communicating the value of regional teams and connecting with overlooked local communities. This breakout discussion shared examples of ways to connect effectively and reflected on the impact these entities can have on U-I partnerships.

Key Takeaways:

- **More funding programs are reviewing how applicants plan to engage different institutions from various sectors.** Before pursuing an award, consider how the opportunity aligns with your state's strengths and goals. Project management tools are helpful in evaluating strengths among corporate partners and university partners and can help organizations decide what topic to pursue and which institutions to engage.
- **Government can serve as an honest broker, convening players and identifying other organizations to ascertain how the opportunity could address challenges within their scope.** The government can help with funding (match-funding, bringing in program managers or grant writers, etc.) and provide an additional set of eyes to review applications.
- **When considering bringing organizations into a proposal, existing partnerships can be leveraged, but so can often-overlooked organizations such as small businesses, entrepreneurs, and angel investors.** When bringing diverse groups together for the proposal, building lasting relationships helps move the community as a whole forward and creates a stronger position to capitalize on future collaborative opportunities.

Connecting Organizations

Facilitator: Jane Joseph, Innovation Works

As universities and companies seek to transform the research landscape and their communities, innovation has emerged as the principal driver for meaningful progress in critical areas, from sustainability and public health to national security and economic advancement. Industry and academia may find value in working with external organizations to accelerate innovation, measure success, and build inclusive ecosystems. This breakout explored regional nonprofits with the goal of supporting U-I research commercialization. Discussion centered on the role these organizations play in partnership building and what partners should expect from leveraging their support.

Key Takeaways:

- **Ensuring external and internal buy-in is one of the best ways to connect organizations.** For academic buy-in, ensure that projects show value by being a badge demonstrating excellence or by solving a problem. Understanding industry values and where companies are willing to invest can ensure corporate buy-in on projects.
- **Successful innovation ecosystems rely on a variety of location-based factors.** The success of a region may be based on affordability and the presence of large, powerhouse universities.
- **Competition is in the eye of the beholder.** Everyone is searching for funding, but everyone also has distinct variations in their work. Emphasizing these differences is a way to avoid competition in support of a more mutually beneficial and collaborative ecosystem.

The View from Liftoff: Insights from Recent Large-Scale Federal Awardees and Finalists

Moderator: *Rebecca Robinson, Kansas State University*

Speakers: *Iain Macdonald and Tom Weller, Oregon State University; Kirk Dombrowski, Corine Farewell, and Doug Merrill, University of Vermont*

Government programs have increasingly made economic development initiatives and impact a fundamental aspect of research funding opportunities. In this session, organizations seeking to leverage and accelerate existing efforts to foster innovation and spur economic development heard from teams that recently received U.S. government awards to spur regional growth. Current [U.S. NSF Regional Innovation Engines](#) and [U.S. EDA Tech Hub](#) awardees and finalists reflected on everything from the proposal process to their vision for implementation and measuring success.

Key Takeaways:

- **Creating resilient jobs that pay competitive wages requires the integration of modern technologies.** The [U.S. Build Back Better Act](#) provides funding for industry and academia to collaborate on R&D opportunities that drive the economy and job creation.
- **Trust between partners is essential for effective collaborations.** Partners and stakeholders must examine and evaluate the partnership on a continuous basis to build and maintain the relationship's foundation of trust.
- **Build based on industry ideas rather than budget.** Rather than approach projects based on available funds, seek out prescient ideas in industry and pursue their applications.

Addressing the Semiconductor Talent Shortage: Cross-Sector Strategies for the Future

Moderator: *Kelsey Evans, University of Texas, Austin*

Speakers: *Alyssa Reinhart, Texas Institute for Electronics; Katy Crist, TEL*

A recent projection estimated that an additional million skilled workers will be needed to meet the semiconductor industry's demand in 2030. As companies look to bridge talent gaps and build more sustainable supply chains, innovative solutions are needed to overcome the worker shortage.

Key Takeaways:

- **There is currently an economy-wide workforce gap.** In 2023, microchips are more crucial than oil, and there is a demand for more computer science and engineering jobs across all sectors of industry.
- **Industry can help to close the gap.** Reaching out for additional resources and support from non-profits and other membership-based organizations can offer some relief. Military personnel also have skills that transfer well to the semiconductor space.
- **Universities shouldn't be afraid to work with "rival" institutions.** Keeping students at the center of the mission can help to foster more collaborative interactions. Also, consider the unique resources and expertise that differentiate universities to foster a collaborative environment rather than focusing too much on competition.

The Practical Aspects of Student Capstone Projects

Facilitator: Alice Grgas, University of California San Diego; Dave Gregg, ATA Engineering

Industry-sponsored capstone projects (ICPs) undertaken on campus with faculty supervision can provide a positive student experience, result in further collaboration opportunities for faculty, and give companies access to a prepared talent pipeline. ICPs offer numerous education and innovation benefits; however, universities and capstone sponsors should be sensitive to key considerations when establishing and executing them. Questions from intellectual property to confidentiality requirements and other terms were answered.

Key Takeaways:

- **Capstone programs bring a unique set of benefits and challenges.** Programs can give companies the opportunity to access and assess fresh talent, get new perspectives on challenges, and showcase company culture and technology to prospective hires. Students get hands-on experience with real-world projects. However, IP, funding processing, and inconsistency across university departments can pose challenges.
- **Effective practices go a long way toward ensuring successful capstone projects.** ATA Engineering deploys an effective framework by establishing a project structure, defining expectations, weekly status updates, and adjusting expectations accordingly. Often, students were weakest in project management. Defining milestones and leaders helped give students the structure needed to manage the project.
- **Everyone handles capstone projects differently.** Even within the same school or department, there will be variations between project cost, approach, or duration. It's likely that these variations will even exist between projects in the same school and department, so always be prepared for something new.

Engaging Beyond the Classroom: Implementing and Running a Co-op Program

Facilitators: Ross Johnston, University of Waterloo; Sarah Lima, Geotab

As the future of work and job markets rapidly evolve, universities and corporate partners seek the best path forward to ensure they meet demand. Models ranging from nondegree credentials and certifications to apprenticeships and experiential learning abound. Co-ops are one way for universities to enrich the student experience while providing ROI to company partners. In this breakout session, participants considered the undergraduate co-op program as a model for meeting current and emerging workforce needs.

Key Takeaways:

- **Tailor each program to meet the needs of university students and industry.** Universities should prepare students academically and professionally. The University of Waterloo provides workshops to help students navigate job searches and professional development programs for

all students to improve communication with companies during the co-op process and post-graduation.

- **Co-op programs help fill the talent pipeline.** They are effective for identifying and assessing future talent, including candidate fit within the company culture. Geotab has an extensive onboarding process for interns to hit the ground running when they convert to full-time employees—something that has helped improve retention.
- **Universities should constantly review their co-op programs and measure their success.** The University of Waterloo conducts feasibility studies to ensure they have the necessary resources to support students and industry before beginning the co-op process.

Executive Education: Deepening Relationships and Providing Partner Benefits

Facilitators: Emily Hostage and Art Lerner-Lam, Columbia University

Executive education plays an important role in ensuring leaders remain innovative, responsive, and agile. University corporate engagement offices that offer executive education may give partners access to these programs as a benefit. This session explored how organizations can incorporate executive education into their partnerships, the roles and responsibilities involved, and the benefits and challenges associated with these programs.

Key Takeaways:

- **Course content must be customized for different audiences.** Varying levels of expertise and scope should be considered when designing course content.
- **The depth and breadth of programs determine the impact that executive education will have on businesses.** Transdisciplinary elements should be integrated into program development to ensure high impact.
- **Industry provides value and topics of highest interest for executive education curriculum development.** Industry insights provide granular detail about what problems potential partners are interested in. This also puts faculty into a more dynamic mode in terms of instructional design.

Clarifying Career Paths for PhDs

Facilitators: Shoba Subramanian, Amazon; Rhonda Sutton, North Carolina State University

Companies seeking to recruit PhD students find that applicants often lack the ability to apply theory to business needs. They also lack a deep understanding of industry needs and culture. Students are frequently unclear about the skill requirements, types of roles, and potential career paths available in industry. This discussion focused on PhD career pathways with special attention to how university and company representatives can prepare students and faculty for diverse opportunities after graduation.

Key Takeaways:

- **Work in academia represents only a small percentage of employment after earning a doctorate.** Most individuals continue with postdoctoral studies, while industry is the next most common career path.
- **Everyone is responsible for ensuring that PhDs are prepared for diverse career paths.** Future employers, universities, and funding agencies should ensure that future talent can move into any sector and have the skills and competencies to ensure their success.
- **One approach to ensuring doctoral students are prepared for diverse career paths is to get faculty excited about non-academic careers and programs focused on professional development.** Ultimately, students who are prepared for diverse career paths will be better researchers, communicators, and project managers, which can help them in the lab. Imbuing coursework with professional development benefits students, faculty, and future employers.

Building Meaningful Partnerships to Address Talent Gaps

Moderator: Jennifer King, Bisk Education

Speakers: Raf Luna, Novartis; Brittney Miller, Charles R. Drew University

As part of the Beacon of Hope, Novartis's 10-year collaboration with 26 Historically Black Colleges and Universities (HBCUs), the company is working with the Thurgood Marshall College Fund (TMCf), Coursera, and the National Medical Association to co-create programs addressing the root causes of disparities in health and education while creating greater diversity, equity, inclusion, and trust across the research and development ecosystem. Attendees heard from the Novartis Institutes for BioMedical Research about its strategy to build career readiness in drug discovery and clinical research.

Key Takeaways:

1. **Filling gaps begins with informing students about careers in industry.** Offering experiential learning opportunities and making them accessible to all students, particularly students at minority-serving institutions (MSIs), is critical. Novartis Early Investigator Program, which began offering opportunities for summer experiences for students at Meharry Medical College after establishing ties during HBCU Engage 2023, tailored its program to meet students' time constraints and financial needs.
2. **A strategic, collaborative approach is critical.** Identify partners who align with your goals and are committed to diversity to meet talent pipeline gaps. Flexibility and adaptability are important as needs change for both parties in the partnerships. Feedback loops and transparency about what is possible (and what is not) are important to continually strengthen the partnership.
3. **Start small and dive in.** Novartis began with only two in its first program cohort, but the results are positive, and the program is poised to expand beyond Meharry to other MSIs. Charles R. Drew University's program cohort is 22 students; success is measured through core workshops and projects, plus the ability to transition to internship and workforce opportunities.

Responding to Research Security: A Case Study with the University of Twente

Speaker: Irna van der Molen, University of Twente

A decade ago, open science was touted as the necessary pillar supporting fresh innovation and sustainable development to address global challenges. However, subsequent events have brought governments to move further from open and closer to restricted innovation. In this session, participants heard from the University of Twente on how it has operationalized its response to research security concerns and requirements.

Key Takeaways:

- **The University of Twente's approach to research security starts with ambitions.** Irna van der Molen defined these as trustworthiness, entrepreneurship, openness, and inclusiveness. Keeping ambitions in mind when balancing research security needs is crucial.
- **Holistic and preventative approaches to research security can stop problems before they occur.** Consider all procedures and risk management processes, training, reviews, audits, record keeping, and policy alignment as elements of the research security strategy.
- **Research security relies on asking the right questions.** For example, what information do you need to cooperate on research areas? What technology is involved, and at what technology readiness level? With whom and where will the research occur?

The Path Ahead with the Head of NSF's Office of International Science and Engineering

Moderator: Anthony Boccanfuso, UIDP

Speaker: Kendra Sharp, Office of International Science and Engineering, NSF

As Head of the Office of International Science and Engineering at the National Science Foundation, Kendra Sharp oversees efforts to build infrastructure to advance science and engineering research and education across the United States. In this keynote, she shared her perspectives on international collaborations in the context of rising geopolitical tensions.

Key Takeaways:

- **NSF is focused on three key goals.** These are leveraging partnerships for research, building a diverse, globally engaged STEM workforce, and strengthening U.S. research leadership globally.
- **The NSF Office of International Science and Engineering employs several models for international partnerships.** The most common model is PI-to-PI relationships, which account for 75-80% of international collaboration-based NSF grants. NSF also engages in bilateral government agency-to-government agency partnerships and has recently been engaged in multilateral funding on a new scale, leading a multilateral solicitation with the UK, Canada, and Australia.
- **OISE is always looking to seize strategic opportunities.** The office works closely with the White House Office of Science and Technology Policy, the National Security Council, and the

Department of State to align with government priorities. OISE considers the benefits to the U.S. community when evaluating opportunities.

Research Security and Counterintelligence

Facilitators: Chris Feuerstein and Pete Hunt, L3Harris; Heidi Becker, Digital Science; Kevin Gamache, Texas A&M University

As the U.S. legislative and executive branches seek to protect the country's intellectual property and defense R&D from illicit use by China, companies and universities face new boundaries and research structures; conflict of interest reporting and export control requirements are on the rise. This session discussed the current research landscape and how partners are affected by counterintelligence guidance.

Key Takeaways:

1. **Research security issues aren't new, but the bar for research security is getting higher.** New U.S. government guidelines in the form of [NSPM-33](#) require more intensive due diligence. For the defense technology industry, the Defense Research Guidelines offer details for implementation of research security policies in the defense landscape. The Defense Industry Research Alignment requires transparent partnerships and aligns industry guidelines with university requirements for restricted and basic research. The Defense Science Board report, [Balancing Openness and Security Across the DoD Academic Research Enterprise \(July 2023\)](#), estimated the annual cost of espionage and stolen IP to the U.S. economy is between \$225 and \$600 billion.
2. **Today's tools make the process of vetting people and organizations simpler and faster than manual searches.** Research security touches units across the university, from grants administration to human resources, faculty, IT, office of research, and leadership. Tools such as Digital Science's Dimensions product assist with risk prioritization and assessment, support verifying disclosures, and vetting visiting scholars, new hires, and PIs. The Australian Strategic Policy Institute offers a helpful tool, the [China Defence Universities Tracker](#), to track collaborations.
3. **Industry relies on university partners to vet students and faculty engaged in research relationships.** Key questions industry has for university partners on sensitive projects and cybersecurity include how data is transferred, cybersecurity protections, and how access to labs is controlled. From the university side, cybersecurity systems costs are high. Their questions include how a company decides what is truly needed, and who will cover the cost. Cost is a challenge for universities without significant defense-related sponsored research. Deep, trusting relationships between faculty and the university research security office are extremely valuable to understand risks and context.

Strategies for Identifying Strategic Partners

Facilitators: John Wilson, GSK; Sacha Patera, Princeton University

Selecting the right collaborator and moving past transactional relationships is a shared desire of many UIDP members across the globe. The most successful strategic U-I partnerships are built on more than just the partners' technical competencies; they depend on mutual interest in a long-lasting collaboration and shared research values. Attendees heard from partnership managers on how they identified key collaborators across borders and the actions they take to ensure liftoff.

Key Takeaways:

- **Scientific alignment is critical for identifying strategic partners.** If partners aren't aligned, the relationships can't function at a level considered strategic or worth heavy investment. Alignment helps create relationships that last.
- **Internal relationships must be solid to develop solid external relationships.** Strong communication lines and existing connections within other offices (e.g., the tech transfer office) can build the foundation for successful external collaborations.
- **Existing relationships can be expanded to become strategic partnerships.** Include more faculty and research areas to build on current relationships. Tools can help find areas of overlapping interest; Princeton has a [Research with Princeton](#) database of researchers, projects, publications, and facilities to make finding areas of collaboration easier.

Measuring Success in Multinational Partnerships

Facilitator: *Gretchen Neisler, University of Tennessee, Knoxville; Mark Ortiz, Sony*

As organizations form collaborations across borders, stakeholders and partnership managers want to know what makes each partnership successful. In this discussion, facilitators reviewed key findings from UIDP's Collaboration Metrics publication and explored how these metrics stay the same or differ in the context of international partnerships.

Key Takeaways:

1. **Cultural differences impact partnerships.** Staying aware of these nuances ensures successful engagements over the long term. Active monitoring of communications by all parties involved is useful so any misunderstandings can be quickly identified and resolved.
2. **An anchoring initiative or component is necessary for multinational partnerships.** Graduate student engagement, student internships, or post-doctoral scholarships are all salient indicators of strong multinational partnerships due to their yield of measurable outcomes like jobs, research production, and product commercialization.
3. **Some universities find it challenging to message the value of their global work to their local residents.** Public universities should communicate the value and ROI of their multinational partnerships with their local partners and supporters. Connecting global partnerships and outcomes with solutions to local problems can effectively demonstrate value to the region.

Advancing R&D Missions through International Efforts

Moderator: *Bethany Wolf, Mars*

Speakers: Koen Debackere, KU Leuven; John Roberts, Massachusetts Institute of Technology

Many institutions seek creative ways to advance internal missions. Research-intensive organizations know that international efforts can progress central goals by harnessing global expertise, leveraging cross-cultural insights, and gaining access to new funding sources. In this discussion, attendees heard from university leaders about ways their international corporate partnerships have informed and driven their missions at home.

Key Takeaways:

1. **Build a framework for strategizing international efforts.** At KU Leuven, it is strategy following structure, not vice versa. From a strategic perspective, international collaborations have been extremely important for their science foundation to enhance connectivity with the rest of the world. From MIT's perspective, a push for the university to focus internationally followed naturally from the realization among faculty and industry partners that the problems they wished to address together are global in scope.
2. **Global partnerships benefit from in-person interaction.** Before the pandemic, MIT traveled extensively to nurture international relationships and recognized the cultural importance of meeting in person, especially in countries such as Japan and Brazil. The face-to-face interactions post-pandemic continue to be critical for moving MIT international relationships forward. KU Leuven concurred with MIT's philosophy that the best way to conceive and develop projects is through in-person meetings and shared laboratories.
3. **Companies must understand the culture of research, while scientists must understand the culture of companies at the international level.** Culture is an intangible that must be addressed and, from a tech transfer and relationship perspective, should always be high on the agenda. During international discussions, ask questions, be as diplomatic as possible, admit that partners are still learning, and apologize when something arises that is not completely understood.

The UIDP Virtual 2023 conference report is not intended to be a detailed record of the entire proceedings. Contact UIDP at info@uidp.net for any questions or comments about this report.

About UIDP

UIDP is a solutions-oriented forum where academic and industry representatives find better ways to work together. Our membership, comprising top-tier innovation companies and world-class research universities, identifies issues affecting university-industry relations and seeks new approaches to partnership and collaboration. Together, we produce tools and resources to help members make a greater impact. We don't just talk about problems. We solve them. Learn more at uidp.org.

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