



**Division of  
Science, Technology  
& Innovation**

## **2020 Annual Report**

Empire State Development

Division of Science, Technology & Innovation (NYSTAR)

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## Introduction

Empire State Development (ESD)'s Division of Science, Technology and Innovation (NYSTAR), part of the state's economic development agency, is tasked with advancing technology innovation and commercialization in New York State. NYSTAR plays an integral role in ESD's economic development strategy by overseeing funding for university research centers and by providing assistance to businesses through NYSTAR's Centers of Excellence, Centers for Advanced Technology, Manufacturing Extension Partnership centers, Innovation Hot Spots, New York State Certified Business Incubators, Science + Technology Law Center, and other assets. This approximately \$55 million portfolio of state-supported high-tech assets touches all points of the state's innovation economy, including but not limited to advanced materials, biotech and life sciences, renewable energy, materials processing, optics and imaging, software and digital media, and electronics technologies.

NYSTAR play four key roles in supporting innovation ecosystem in New York State:

1. Administering programs to ensure they are delivering established goals and purpose;
2. Encouraging collaboration to accelerate technology and company growth;
3. Creating new initiatives to further support innovation and fill gaps in available company assistance; and
4. Attracting additional federal and other funding into New York State by providing matching grants, assisting with consortium-building, and occasionally applying directly for federal funds.

New York State ranks highly for most measures of science and engineering strength, the strongest indicators of research and innovation. According to the NSF's Science and Engineering State Profiles, New York ranks second in the nation for higher education R&D in science and engineering fields; second for state government R&D expenditures; sixth for federal R&D obligations; and third for the number of utility patents issued to state residents. New York State has made unparalleled investments in world-class technology assets and expertise in order to strengthen its position as a global hub of innovation. Annual state R&D investments of \$450 million are complemented by nearly \$16 billion in annual business R&D.

In addition to this report, NYSTAR releases reports for three individual programs periodically throughout the year. NYSTAR has separately issued reports for the following programs:

- Centers for Advanced Technology (covering the 2016-2017 and 2017-2018 contract years)
- Centers of Excellence (covering the 2016-2017 and 2017-2018 contract years)
- Manufacturing Extension Partnership (covering 2017 and 2018)

This report covers NYSTAR's remaining programs, initiatives, and updates not covered in these reports. Information included in this report includes: Requests for Proposals (competitions); federal awards; the Innovation Hot Spots & Certified Business Incubators Program; Matching Grants Leverage Program; Faculty Development Technology Transfer Incentive Programs; Science + Technology Law Center; and a summary of fields of technology with significant potential for the state's economy.

## Requests for Proposals

NYSTAR held three competitions in 2018 to 2019.

### Centers for Advanced Technology (CATs)

The CAT program is designed to:

- Spur technology-based applied research and economic growth in New York;
- Encourage applied research collaboration and innovation with industry;
- Leverage state funds with investments from the federal government, industry; foundations, and not-for-profit economic development organizations; and
- Increase the competitiveness of New York State companies over the ten-year designation period.

In May 2019, through a Request for Proposals, two new Centers for Advanced Technology were selected by a review panel for a ten-year designation of up to \$921,200 per year per center:

- **City University of New York**, Advanced Science Research Center, Center for Advanced Technologies in Sensors for Exploration of Natural Systems and Environments (ASRC Sensor CAT)
- **Binghamton University**, Center for Flexible Hybrid Medical Device Manufacturing (FlexMed)

### Small Business Innovation Research (SBIR) Assistance Program

Under the federal SBIR program, eleven federal agencies set aside a percentage of their extramural budget so small businesses can engage in research and development (R&D) that has a strong potential for technology commercialization.

NYSTAR's SBIR Assistance program is designed to increase the number of New York State SBIR awardees and train a growing number of individuals and organizations in preparing competitive proposals. Two centers were awarded to provide this assistance:

- **Stony Brook University** was awarded \$200,000 to provide SBIR assistance to individuals and companies in the New York City, Long Island, and Mid-Hudson regions.
- **Cornell University's Center for Regional Economic Advancement** was awarded \$300,000 to provide SBIR assistance to individuals and companies in the other seven New York State regions (Capital Region, Central NY, Finger Lakes, Mohawk Valley, North Country, Southern Tier, Western NY).

## **Cybersecurity Assistance**

In 2018, NYSTAR awarded \$300,060 to Mohawk Valley Community College Advanced Institute for Manufacturing to assist New York State defense supply chain companies in achieving compliance with updated cybersecurity requirements. The award was used to conduct cybersecurity assessments and implement protocols necessary to meet standards set by the Defense Federal Acquisition Regulation Supplement (DFARS).

Cybersecurity assessments and remediation measures help New York State companies maintain and grow their defense-related contracts, enhance competitiveness, create jobs, and contribute to innovation in industries that are critical to U.S. security. This was part of an ongoing NYSTAR commitment to improving New York State companies' ability to protect their data assets from growing cybersecurity threats.

## **Federal Awards**

NYSTAR serves as the New York Manufacturing Extension Partnership (NY MEP) under a designation from the National Institute of Standards and Technology's Hollings Manufacturing Extension Partnership (NIST-MEP). NY MEP is supported through a combination of federal and state funding. NYSTAR administers NY MEP through a network of 11 organizations that provide growth and innovation services to small and mid-sized manufacturers in every corner of the state to help them create and retain jobs, increase profits, and save time and money. (NYSTAR issued a separate report covering the NY MEP program impacts for the 2017 and 2018 contract years.)

In 2018, NYSTAR secured \$304,600 in funding from the U.S. Department of Defense's Office of Economic Adjustment to assist New York State manufacturers that need to comply with defense cybersecurity standards. With this funding, NYSTAR supported Mohawk Valley Community College Advanced Institute for Manufacturing's completion of four workshops, 24 security assessments, and 13 system security plans to help New York companies gain or maintain their status as eligible defense contractors and secure the supply of critical goods and technologies to the Department of Defense.

## **Innovation Hot Spots & Certified Business Incubators**

The New York State Certified Business Incubator and Innovation Hot Spot Program provides financial support for certified incubators in the state to expand their services and reach a greater number of early stage companies. These competitive designations are for five years. Support at individual designees vary but generally include: physical space; shared administrative staff; access to capital; coaching; mentoring; networking connections; prototype development; and access to other technical services. In addition, Innovation Hot Spots are charged with coordinating regional entrepreneurial ecosystems, and can offer certain tax benefits to client businesses.

In the 2017-2018 contract year, this program resulted in the creation of 882 jobs, the retention of 432.5 jobs, and about \$222 million in non-job economic impact.

Aggregate Impacts (2017-2018 Contract Year)										
Innovation Hot Spots										
Region	Center Name	Jobs Created	Jobs Retained	Increased Revenues	Investment Obtained	Cost Savings	Govt Funds Acq'd	Non-Govt Funds Acq'd	Capital Improvements	Total Non-Job Impacts
Capital Region	Innovate 518 at University at Albany (Hot Spot)	10.5	0.0	\$2,401,180	\$706,512	\$65,000	\$3,000	\$0	\$494,265	\$3,669,957
Central NY	The Tech Garden (CenterState CEO)	178.5	224.5	\$354	\$2,235,471	\$20,434,500	\$2,308,503	\$2,012,634	\$0	\$26,991,462
Finger Lakes	NextCorps	22.0	43.0	\$1,889,617	\$1,700,000	\$185,836	\$94,000	\$0	\$96,000	\$3,965,453
Mohawk Valley	thINCubator (Mohawk Valley Community College)	4.0	0.0	\$229,761	\$27,500	\$24,803	\$0	\$0	\$21,984	\$304,048
North Country	North Country Incubator (Clarkson University)	6.0	0.0	\$11,500	\$100,000	\$0	\$0	\$381,878	\$493,378	\$986,756
Southern Tier	Southern Tier Startup Alliance	6.0	8.0	\$2,026,974	\$50,000	\$33,400	\$0	\$370,000	\$390,000	\$2,870,374
Western NY	WIN: Western New York Incubator Network	386.0	0.0	\$1,914,094	\$43,361,989	\$120,000	\$4,008,927	\$245,000	\$1,796,657	\$51,446,667

Certified Business Incubators										
Region	Center Name	Jobs Created	Jobs Retained	Increased Revenues	Investment Obtained	Cost Savings	Govt Funds Acq'd	Non-Govt Funds Acq'd	Capital Improvements	Total Non-Job Impacts
Capital Region	Biomedical Acceleration and Commercialization Center at Albany Medical College	1.5	0.0	\$1,019,000	\$50,000	\$0	\$0	\$0	\$0	\$1,069,000
Long Island	Long Island High Technology Incubator (Stony Brook University)	6.0	0.0	\$534,226	\$160,000	\$70,000	\$225,000	\$0	\$21,000	\$1,010,226
Mid-Hudson	iCANny	6.0	0.0	\$93,000	\$137,550	\$0	\$0	\$0	\$0	\$230,550
Mid-Hudson	The Accelerator Powered by Orange County IDA	16.0	18.0	\$357,648	\$0	\$82,300	\$0	\$530,000	\$370,432	\$1,340,380
New York City	Downstate Biotechnology Incubator	116.5	136.0	\$2,853,638	\$0	\$479,717	\$3,896,372	\$86,887,927	\$5,030,432	\$99,148,086
New York City	Brooklyn Fashion + Design Accelerator (Pratt Institute)	1.0	0.0	\$109,730	\$0	\$30,000	\$3,000	\$30,000	\$59,159	\$231,889
New York City	Entrepreneur Space (Queens Economic Development Corporation)	57.0	0.0	\$2,449,917	\$65,000	\$10,133	\$0	\$0	\$138,000	\$2,663,050
Southern Tier	Rev: Ithaca Startup Works	62.0	3.0	\$6,605,974	\$18,114,400	\$17,400	\$0	\$195,000	\$35,000	\$24,967,774
Western NY	Fredonia Technology Incubator	3.0	0.0	\$62,503	\$0	\$12,000	\$450,000	\$0	\$600,000	\$1,124,503
<b>Totals (Hot Spots &amp; Incubators)</b>		<b>882.0</b>	<b>432.5</b>	<b>\$22,559,116</b>	<b>\$66,708,422</b>	<b>\$21,565,089</b>	<b>\$10,988,802</b>	<b>\$90,652,439</b>	<b>\$9,546,307</b>	<b>\$222,020,174</b>

## Matching Grants Leverage Program

NYSTAR reviews and coordinates requests for New York State matching grants and support letters to strengthen applicants' proposals to federal agencies, foundations, and other grant-making organizations. Higher education and not-for-profit research institutions in New York State are eligible to apply for these state matching funds. The purpose of this program is to attract more federal R&D funding to support technology development and commercialization efforts in New York State. Awards made in 2018-2019 include those in the following table.

Matching Grants Leverage Program Awards Made in fiscal years 2018-2019 & 2019-2020				
Awardee	NYSTAR Match	Federal Award	Federal Agency	Fiscal Year
Clarkson University	\$102,145	\$288,441	NSF	2019-2020
Cornell University	\$2,353,000	\$17,373,961	NIH /NIGMS	2018-2019
Cornell University	\$621,875	\$9,950,000	DoE / EFRC	2018-2019
Columbia University	\$2,205,530	\$6,276,836	NIH /NCI	2018-2019
Cornell University	\$1,512,740	\$4,912,040	DOD/CDMRP	2018-2019
Health Research, Inc. (Roswell Park)	\$200,000	\$700,000	DOE/EERE	2018-2019
Health Research, Inc. (Roswell Park)	\$198,250	\$396,500	DoE ARPA-E	2018-2019
Rensselaer Polytechnic Institute	\$779,980	\$334,355	Foundation for Food & Ag. Research	2019-2020
Rensselaer Polytechnic Institute	\$599,997	\$1,659,501	DoE / National Energy Technology Lab	2018-2019
Rensselaer Polytechnic Institute	\$320,000	\$1,000,000	NIH	2018-2019
Rochester Institute of Technology	\$2,353,000	\$17,373,961	NIH /NIGMS	2018-2019
University of Buffalo	\$621,875	\$9,950,000	DoE / EFRC	2018-2019
University of Buffalo	\$2,205,530	\$6,276,836	NIH /NCI	2018-2019
<b>Total</b>	<b>\$8,893,517</b>	<b>\$42,891,634</b>	<b>4.8:1 Benefit cost ratio</b>	

## Faculty Development & Technology Transfer Incentives Programs

New York’s world-class universities and research institutions are powerful drivers of economic development. The Faculty Development Program and Technology Transfer Incentive Program further support New York’s leadership in technology-related research and commercialization. The Faculty Development Program assists institutions of higher education in New York State in the recruitment and retention of leading entrepreneurial research faculty in science and technology fields with strong commercial potential. The Technology Transfer Incentive Program helps New York companies commercialize high-tech innovations in partnership with colleges and universities by providing awards to institutions of higher education to move leading-edge technologies from the research lab to the marketplace. These programs thereby support a wide array of activities associated with commercialization, such as improvement of product prototypes and existing products, new product development, development of manufacturing processes for new products, and filing patent applications. Requests for Proposals to these programs are issued periodically when funding is available. Awards made in 2018-2019 include those in the following table.

Faculty Development & Technology Transfer Awards Made in 2018-2019			
Awardee	Contract Amount	Contract Start Date	Contract End Date
Clarkson University	\$62,500	7/1/2019	12/31/2020
SUNY Research Foundation	\$100,000	1/1/2019	12/31/2021
SUNY Research Foundation	\$100,000	6/1/2019	05/31/2022
SUNY Research Foundation	\$100,000	1/1/2019	12/31/2021
SUNY Research Foundation	\$62,500	7/1/2019	12/31/2020
New York University	\$62,500	3/1/2019	08/31/2020

## Science + Technology Law Center

NYSTAR is the primary funding source for the New York State Science & Technology Law Center<sup>24</sup> (STLC) and is housed at Syracuse University College of Law. This organization provides legal research, education, and information to entrepreneurs and companies to help commercialize new technologies from lab to market. From market landscapes to intellectual property protection to licensing options to potential funding sources, STLC has helped scores of companies and institutions make their technology vision become a commercial reality. Syracuse University was awarded a STLC re-designation in a 2017 competition for a period extending through March 2023.

Typical STLC clients include start-up and established tech companies, as well as entrepreneurs, with the STLC providing additional services to research centers, technology transfer offices, and incubators. Key areas of service include:

- **Patent landscapes and trademark searches** – STLC’s research team performs patent and trademark searches providing valuable information that a client can share with an attorney to provide the groundwork for drafting claims and offering opinions on patentability. STLC also provides more generally applicable informational literature on intellectual property for prospective inventors seeking to be proactive in protecting their IP rights.
- **Regulatory overviews** – STLC provides analysis of both state and federal regulations, as well as industry-specific standards and certifications that are critical to market entry. By providing early and accessible regulatory insight, businesses are better equipped to remain in New York, create jobs, and spur innovation.
- **Market research and segmenting** – Clients receive in-depth analysis into who the customers are in a given market and, for innovations with multiple applications, which markets can offer the most rewards. Examples of previous projects include identifying sell points for a specialized gastroenterology therapy within the EU and the U.S. medical systems, exploring ideal sub-segments of commercial buyers for cutting edge lawn equipment, and primary market research such as surveys to determine what feature sets and price points appeal to various demographics for marketing new speaker technologies.
- **Competitive landscape** – Entrepreneurs and researchers attempting to commercialize new technology rarely know the full scope of their intended market’s competition. STLC’s competitive landscape analysis provides clients with a breakdown of potential competitors and identifies significant product differentiators, enabling clients to find underserved consumer segments and areas where the prevailing technology is vulnerable to disruption or possible licensing opportunities.
- **Commercialization analysis** – Many inventors and entrepreneurs hold valuable patents but are unclear on how to bring a product to market. STLC conducts market research and advises on potential business models, licensing strategies, or the appropriate distribution/go-to-market strategy. Clients receive analysis of competing business models based on market and team factors, promoting the development of an informed strategy.

In addition to research, STLC has continued its education and outreach efforts through participation in pre-seed workshops, FuzeHub Solutions Forums, conferences and sponsorships, publication of guidebooks, webcasts, listings of New York State patent agents and patent law firms by region, and a monthly *Innovation Review* newsletter. STLC also collaborates with a network of Technology Commercialization Clinics located at research institutions and business schools throughout the state in order to best serve its clients.

## Fields of Technology with Significant Potential

Empire State Development and its Division of Science, Technology & Innovation periodically review industry and technological developments to identify areas of strategic importance. The following industries were identified in 2019 as the top ten industries having the greatest potential to create high-paying jobs and further develop technology-intensive ecosystems (higher education, R&D, supply chains, etc.) in New York State over the next 10 years.

- Software as a Service (Saas)
- Artificial Intelligence and Machine Learning

- HealthTech
- Life Sciences
- Digital Health
- Cybersecurity
- Robotics and Drones
- Internet of Things
- CleanTech
- 3D Printing

As NYSTAR identifies technologies of strategic importance, these may be reflected in future competitions to designate new Centers for Advanced Technology or as focuses of other efforts related to commercialization and innovation.

## Impacts Methodology

“New jobs” refers to permanent, full-time positions created in the course of business expansion resulting from the NYSTAR program’s efforts.

“Retained jobs” are those that may be at risk when companies consider relocation because of high operating costs, incentives offered by another location, or production contractions. If a company credibly substantiates that jobs were at risk and that collaboration with the NYSTAR-supported center was a significant reason for their retention, those jobs are counted as retained. That substantiation must include documentation comparing operating costs vis-à-vis another location and specific offers or incentives for relocation.

“Economic impact” or “non-job impact” refers to the following impacts reported by companies served by CATs, COEs, Innovation Hot Spots, and Certified Business Incubators. Note that it does not reflect any increase in paid wages or the multiplier effects of these impacts, and therefore understates total cumulative changes in employment, earnings, and output in New York State attributable to the efforts of these programs. Larger reported impacts are subjected to greater scrutiny by NYSTAR and at times require confirmation from a third party. NYSTAR follows a threshold formula for determining the necessary level of evaluation.

- **Increased revenues:** NYSTAR-supported assets frequently collaborate in new product development or existing product improvement that directly increases client revenues. In extraordinary circumstances, NYSTAR may credit impact for retained sales with sufficient documentation that due to the center’s work, the company was able to retain a specific customer that it would have otherwise lost.
- **Cost savings** realized by the company as a result of a company’s collaboration with a NYSTAR-supported center, which typically accrue from production process improvements, the value of accessing specialized equipment, expertise, or analytical testing, and other research savings. When savings are reported because the center is providing services such as access to equipment, analytical testing, or research expertise that otherwise would have to be done by the company in-house, the credited cost savings is not the total amount the research would have cost the company in-house, but the difference between this cost and the amount contributed by the company.

- **Funds acquired** by the company. These include any non-New York State sources of funds. They may include non-NYS government funds, for example federal sources like the Small Business Innovation Research program. They may also include venture capital and other business investments. There must be a demonstration that the NYSTAR-supported center played a substantive role in helping the company obtain the funds.

NYSTAR follows documented economic impact review procedures. For most programs, impacts reported to and credited by NYSTAR meet the following conditions:

- Occurred during the current year and not previously credited to that center;
- Actual impact rather than projected;
- Occurred within and benefited a company within New York State;
- Resulted from collaboration with a NYSTAR-funded center; and
- Documented with a company letter of attestation and other substantiating materials as noted above.