NYSUNY 2020 CHALLENGE GRANT PROPOSAL
The Emerging Technology and Entrepreneurship Complex

INTRODUCTION

In response to Governor Andrew Cuomo and SUNY Chancellor Nancy Zimpher's NYSUNY 2020 Challenge Grant initiative, the University at Albany is pleased to advance a proposal that leverages $35 million in capital funding to build a **state-of-the-art R&D complex for emerging technologies and entrepreneurial leadership.** This hub of innovation will bring together researchers, entrepreneurs, and investors, providing the technology transfer and commercialization resources to drive economic growth, create jobs, and enhance New York's competitiveness in key industries.

Guided by UAlbany's strategic goals, this proposal is powerfully aligned both with Governor Cuomo's *New York Open for Business* economic development agenda and SUNY's system wide strategic plan, *The Power of SUNY.* As part of the campus-wide NYSUNY 2020 initiative, the plan will **create and retain more than 2500 jobs**, attract new companies to New York State, advance innovative research and technologies, and generate more than **$1.8 billion in economic impact** throughout the Capital Region.

Corporate CEOs consistently report better performance and profitability when companies form partnerships with institutions of higher education and tap into their intellectual capital and research infrastructure. New York State and SUNY can capitalize on an urgent need to create an entrepreneurial ecosystem for business and industry to leverage university research—and for university researchers to become more entrepreneurial. This NYSUNY 2020 proposal will create those pathways by:

1. Building the Emerging Technologies and Entrepreneurship Complex (E-TEC) to harness UAlbany's capacity in emerging technologies by accelerating cooperative R&D, technology transfer, business development and workforce training— which will be amplified by the presence of the **Small Business Development Center (SBDC)** and the new **Office of Entrepreneurial and Commercialization Services.** E-TEC will also draw on and expand the **School of Business's** educational and programmatic resources.

2. Providing business and industry with a "front-door" to four co-located, global-leading research clusters: **Climate and Environmental Science, Biomedical Sciences and Biotechnology, Forensic Science and Cyber Security**, and **Advanced Data Analytics**—all of which are seeing exponential growth in industry demand for new tools and technologies. E-TEC will provide advanced research facilities and cultivate the strategic partnerships needed to meet that demand in an environment that cultivates industry collaboration, accelerates commercialization, and fuels future research at the **College of Nanoscale Science and Engineering.**

3. Attracting private sector companies to locate in or near E-TEC as research and business partners. The response from the private sector to this proposal has been extremely positive. To date, seven companies have expressed interest in co-locating in E-TEC: four companies from the environmental sciences and clean energy research space: **Vaisala, AWS Truepower, Meso Inc.** and **Direct Gain**, and three private sector startups in the biomedical sciences: **SIRGA, NeuraCell** and **MBMR Biolabs Inc.**

THE EMERGING TECHNOLOGY AND ENTREPRENEURSHIP COMPLEX

Located on the UAlbany campus, the 225,000 square foot **Emerging Technology and Entrepreneurship Complex (E-TEC)** will create a breakthrough research and development facility for business, industry, and government, increasing access to the University's nationally recognized academic and research programs, and business development and technology transfer expertise. Integrated facilities will build industry partnerships to increase federal and private research funding, fostering a culture of entrepreneurship and driving commercialization informed by industry needs.

E-TEC's interdisciplinary, cross-sector "sandbox" will create new opportunities for highly innovative collaboration among a diverse group of researchers, entrepreneurs-in-residence, startup companies, and a wide range of private and public sector stakeholders in this unique consortium of innovators, investors, and customers.

The new **Office of Entrepreneurial and Commercialization Services** will serve as the hub of business development and learning in the complex. UAlbany's **Small Business Development Center** will relocate to E-TEC to assist University researchers with on-site tools, resources and expertise for forming new companies and attracting loans and venture capital. The **University Technology Transfer Office** will also be co-located with the transformative research clusters in E-TEC, creating novel opportunities to accelerate university-industry commercialization to generate new patents, inventions, licenses, and start-up companies.

UAlbany's **School of Business** has already pioneered externally sponsored student entrepreneurship competitions, and co-created professional science management training programs. These innovative approaches to knowledge-based business development, entrepreneurial training and technology commercialization will contribute to an innovative learning environment that will lead more new businesses to spin out from University research partnerships. E-TEC will also train the highly skilled workforce required to expand existing business and to support start-ups locally in these high technology sectors.

TRANSFORMATIVE R&D CLUSTERS

THE CLIMATE AND ENVIRONMENTAL SCIENCE R&D CLUSTER will capitalize on the University's internationally recognized strength in atmospheric and environmental science to pursue advances in environmental and climate prediction, serving as the R&D arm of climate-sensitive industries, including power and utility companies, renewable energy businesses, transportation-related corporations, and insurance carriers. Key features will include:

- **Creating the Advanced Environmental Prediction and Innovation Center (AEPIC)** which will house the nation's largest concentration of atmospheric, climate, and environmental science researchers, private industry partners, and the National Weather Service. AEPIC will leverage innovative tools, instrumentation and technologies to empower smarter, data-driven decision-making in the public and private sectors.

- **Developing the New York Environmental and Climate Observation System (NY-ECOSystem)**—a comprehensive statewide network of automated stations that will make New York the only state

capable of providing real-time, local, highly accurate meteorological data in three dimensions. This network will bolster emergency preparedness for business and government, while enhancing grid productivity, reducing energy consumption, and advancing the implementation of renewable energy systems.

- **Partnering with businesses and industry to advance research and technology development** that supports sound planning and decision making, UAlbany researchers and partnering companies will have access to cutting-edge facilities and world-class colleagues with whom to take new ideas, discoveries, and intellectual property to market.

- **Facilitating research collaborations with the College of Nanoscale Science and Engineering**, particularly in the areas of solar photovoltaic implementation and the development of environmental sensors.

- **Establishing the Institute for Climate Policy and Technology**, a pioneering multi-disciplinary, multi-institutional think tank that will study the impacts of climate on key industries and exploring best practices for policymakers and business.

THE BIOMEDICAL SCIENCE AND BIOTECHNOLOGY R&D CLUSTER will capitalize on UAlbany's internationally recognized strength in Life Sciences to pursue advances in areas of neurodegenerative diseases and neurodevelopment, infectious disease, and cancer, expanding existing partnerships and growing new relationships with the pharmaceutical and biotechnology industries. Key features will include:

- **Building upon the transformational RNA Institute** – the only resource of its kind in the world and the cornerstone of the University's Life Sciences Initiative. Ranked #2 in the Governor's Regional Economic Development Council (REDC) competition for the Capital Region, the RNA Institute leverages innovative tools, instrumentation and technologies for RNA science to create innovative solutions for difficult-to-treat diseases.

- **Providing shared infrastructure** in advanced research facilities with state of the art equipment, enabling researchers to form collaborations with both emerging biotech companies and larger established companies

- **Partnering with regional hospitals and healthcare networks** to carry out clinical trials for noninvasive diagnostics for infectious diseases, cancers and neurodegenerative diseases including Alzheimer's and Parkinson's (with the Stratton VA Medical Center), which could lead to the development of a service center for testing and new jobs for highly qualified biotech or medical technicians.

- **Creating a pipeline of well-trained, highly-skilled workers** to support the life science and biotech businesses, as well as attracting new partners to collaborate and co-locate. Together with the Neural Stem Cell Institute, the Trudeau Institute, Wadsworth Center Laboratories, and community colleges, this R&D cluster will provide training of entrepreneurial, scientists and project managers to support the local biotech sector.

THE FORENSIC SCIENCES AND CYBER SECURITY R&D CLUSTER will capitalize on the University's internationally recognized strength in development of novel chemical analytical methodologies for crime scene forensics, an expansion of the Northeast Regional Forensics DNA training academy in partnership with the National Institutes of Justice and the New York State Police, and the development of digital forensic tools to pursue advances in forensic sciences. Key features will include:

- **Assembling a consortium** of analytical chemists, DNA biologists and expert witnesses, material sciences physicists and computational experts into a world-class team of forensics and cyber security scientists to expand the development of intellectual property for criminal investigation and forensic analysis.

- **Creating the Forensic Technology Institute**, a research and service center for local, state and federal law enforcement agencies that will develop new forensic methods, translate research discoveries to practical tools, and perform forensic evidence examination using the state-of-the-art equipment and methodologies.

- **Developing forensic and cyber security core facilities** that meet the needs of both the scientific and the legal communities as well as cyber security and digital forensics analysis capabilities. Digital forensics is a fast growing field in which law enforcement and private companies will increasingly depend on academic support for developing procedures, tools, and standards.

- **Partnering with businesses and industry** to develop innovative analytical chemistry equipment technologies that could transform crime scene investigations locally, nationally, and even globally.

- **Creating the forensic and cyber security workforce of the future** through an expanded Forensic Chemistry undergraduate program— among only ten in the country accredited by the American Academy of Forensic Science—as well as a new digital forensics program.

THE ADVANCED DATA ANALYTICS R&D CLUSTER will build on the University's strength in computer data analytics, multimedia, and natural language processing to pursue advances in making effective use of the increasing volume of information that is at the fingertips. Utilizing an interdisciplinary approach in which technology is developed with a deep understanding of both the application domain and the ways in which humans think, researchers will focus on the development of analytic techniques and computational tools that will help New York-based businesses compete in an increasingly data-driven economy. Key features will include:

- **Creating the Advanced Analytics Research Center**, an interdisciplinary team of cognitive and computational scientists to develop advanced data analytics and computational technologies for a range of applications, including anti-terrorism, medical informatics, free trade, and cyber security.

- **Creating "best-of-practice" teams** that leverage UAlbany's research strengths and enhance the commercialization potential of research, scaling joint ventures like UAlbany's partnership with GE Global Research applying advanced computer vision techniques to develop new monitoring and surveillance technologies.

- **Building on strengths in algorithms and software development** to create novel computing approaches for large, frequently changing social media networks—a key platform for commercial development.

- **Meeting the critical need for skilled graduates** in this economically important field. McKinsey Global Institute estimates that by 2018, the nation will face a shortage of nearly 200,000 people with deep analytical skills as well as 1.5 million managers and analysts with the ability to use big data to make effective decisions. In cyber security, it is estimated that the U.S. currently has only 1,000 technical professionals, while there is a conservative need for 10,000 - 30,000.

OVERALL NYSUNY 2020 IMPACT

JOB CREATION AND ECONOMIC GROWTH

The University's overall NYSUNY 2020 initiative will create **735 new permanent jobs, along with 1,587 new construction jobs**, significantly building the University's academic and research enterprise and growing the greater Capital Region economy. Already, seven corporations and private spin-off companies have expressed interest in co-locating, collaborating and contracting with researchers at the R&D center, further adding to job growth projections.

PRIVATE AND FEDERAL RESEARCH FUNDING

Under UAlbany's NYSUNY 2020 initiative, faculty and researcher hires across the University-wide strategic initiatives will add **$117 million in cumulative research expenditures** to an already substantial portfolio. By year five, **187 new faculty researchers** alone will generate more than $43 million annually in additional research expenditures. With a significant investment in new researchers and support staff, NYSUNY 2020 will be the cornerstone to one of the largest hubs for innovation and R&D in the nation.

EDUCATIONAL IMPACT

In addition to the job creation and research expenditure projections, UAlbany will enroll more than **1,350 new undergraduate and graduate students**, increasing access and preparing more students to become members of a highly educated, globally competitive workforce. All students at the University will benefit from the increased number of faculty and staff, expanded course and research offerings, and a reduced student-faculty ratio. The University's enrollment growth plan also ensures affordability through $5.2 million in enacted TAP eligibility aid, as well as **$2.5 million in increased student aid.**

ECONOMIC IMPACT

Overall, our NYSUNY 2020 initiative will **generate over $1.8 billion in economic impact** throughout the greater Capital Region – a return of over 50 times the investment of the NYSUNY 2020 Challenge Grant. The University's economic impact was derived by using the widely accepted Regional Industrial Multiplier System (RIMS II) from the Federal Bureau of Economic Analysis.