

FEATURE ARTICLE

“Gateway: Changing the Face of the Triad”

In today’s knowledge-driven, global marketplace, change is the only constant. Technological and educational advancements are challenging the status quo. Today, there seems to be an unspoken and endless race toward advancement for a bigger, better and faster product with the potential to impact and change the world. The competition of “who will get there first” has greater and more persistent entrants joining the race on a daily basis. However, the Triad area intends to not only become a significant challenger in the race, but to lead and set the pace of innovation, technology, and research. Enter: Gateway University Research Park.

North Carolina is among the leading states in the quality of its research base in biotechnology, nanotechnology, and genomics. The Triad’s Gateway University Research Park will be a feather in the research and technology cap for North Carolina and the Southeast region of the United States—elevating the area’s prominence as a hotbed for progressive study between Washington, DC and Atlanta, GA.

Gateway University Research Park is a non-profit entity created to operate the joint collaboration between North Carolina A&T State University (NCA&T) and The University of North Carolina at Greensboro (UNCG) for the purposes of research and economic development within the Triad. Gateway University Research Park will attract and retain educational, corporate and community agencies which advance scientific and educational research in technology. The park demonstrates both the commitment and dedication of the Triad community to spearhead a successful future both economically and technologically. When completed, the park is expected to employ 2,000 people and contribute in excess of \$250 million over the next 20 years to the economy of the 12-county Piedmont Triad region, which includes the cities of Greensboro, Winston-Salem, and High Point. The objective is to improve the industries in the region today, while helping to invent the industries of tomorrow, according to Gateway executive director,

John Merrill. “We expect a ‘win-win-win’ scenario for everyone involved—the companies, the universities, and the community.”

As a bridge or “gateway” to the future, the branding of the name encompasses all the aspects that make the project significant for the partnering universities and the research opportunities that will be established. This necessitates a two-way contribution of knowledge: high tech companies educate academic researchers about the complexities of starting and operating an entrepreneurial venture, and academic researchers share their fundamental research knowledge and accomplishments with their industry partner. Both NCA&T and UNCG are recognized as “high research activity” institutions by the Carnegie Foundation for the Advancement of Teaching. NCA&T and UNCG are respectively the third and fourth largest research universities in the University of North Carolina System. The combined expertise of the two universities is distributed across many academic departments in the arts, the sciences, and in professional schools.

In order for the Triad area to compete in the still emerging global economy, the city’s research universities must help to create an engine for economic, social and community development. The area’s long-term future, including its economic development and overall quality of life, will be dependent upon its success in attracting, establishing and/or retaining effective educational and community service agencies and businesses driven by the discovery of new knowledge and technologies. Leaders of the state and Triad must keep this vision firmly in focus. The launch of Gateway University Research Park will make this vision a reality.

Working together, leaders from area businesses/industries and the Technology Transfer offices at NCA&T and UNCG will use the research findings and knowledge based products developed by faculty and students to serve the needs of new and existing companies in the Triad and beyond. The research park is envisioned as a premier center for basic and applied research with the potential for incubation and development of new industries. The park will harness academic scholarship, intellectual curiosity, and applied problem solving to attract industry and improve the human condition. Gateway’s South Campus, located at the Interstate 40-Lee Street interchange in Greensboro, NC, will be home to these activities.

NCA&T: Centers for Energy Research and Technology, Biotechnology & Nanotechnology

The mission of the NCA&T Center for Energy Research and Technology is to enhance undergraduate and graduate education through energy-related research and to transfer this new knowledge to regional and national industries. The objective is to improve economic competitiveness while reducing the environmental impact that results from excessive energy consumption. The research focuses on energy use and energy efficiency in buildings and industrial processes as they relate to technological, economic, political, and environmental issues.

The NCA&T Biotechnology & Bio Sciences (BBS) Research Cluster is a collaboration among the Schools of Agriculture & Environmental Sciences, and Technology, and the Colleges of Arts & Sciences, and Engineering. The Cluster fosters development of highly productive interdisciplinary research teams that study microbial, plant, and animal systems, and genetics as they relate to human health. It fulfills its vision by creating a research-driven infrastructure that stimulates innovation; cultivates creativity and discovery; and supports the land-grant university mission of teaching, research, and extension.

The NCA&T Advanced Materials and Nanotechnology Research Cluster (AMNRC) is a resource of excellence in education and research for the State of North Carolina and the nation in the field of smart, multifunctional, and other advanced materials. Through the collaboration of academe, government agencies, and private industry, the Cluster develops basic and applied research programs and commercially relevant technological innovations while maintaining a focus on student participation and learning. Research on nanoscale and other advanced materials including the pertinent processes, devices, and systems, generates the fundamental scientific understanding of the inorganic, organic, and biological properties of materials. It also generates the engineering and technology which enable breakthroughs to the next generation of applications, ranging from structural materials to smart structures, and from microelectronics to medicine.

These clusters represent three of the many ongoing areas of research at NCA&T that will transform the Piedmont Triad region.

UNCG: Research Activities

For its part, UNCG is carving niches of world-class research in the biological and life sciences. From basic research using insect models to human genomics, exercise physiology and tools for nanobiotechnology, the scientific inquiry at UNCG is impressive for both its breadth and depth. Researchers are exploring fundamental biological mechanisms and their possible impact on human health, disease and development, from neural underpinnings of multi-sensory perception to molecular relationships between hormones and the flexibility of the female knee. They are also exploring wide-ranging questions in ecology and environmental science, including arctic lakes and ultrasonic sound-making by animals in the wild.

For years UNCG has been methodically building the infrastructure to capitalize on the Piedmont Triad's emergence as a regional center for biotechnology. Anticipating the future need, in 1992, UNCG created a Biotechnology concentration to train specialists who could assume management positions in new and growing companies; in 2007, it will complete planning for a doctoral program in medicinal biochemistry. UNCG also spent \$40 million for a new Science Building, created a technology transfer office, incorporated principles of entrepreneurship into research endeavors and expanded outreach with programs such as the Guilford Genomic Medicine Initiative, preventive medicine that uniquely combines physician education, risk assessment, and community health. Backed by institutional leadership and support, tradition, tools and infrastructure, UNCG scientists are focusing on a range of topics that can provide the foundation for innovation, discovery, and economic development through biosciences research.

Nanobiotechnology at UNCG

With expertise in biotechnology, drug design, membrane chemistry and nutrition, UNCG is poised for a role in the new field of nanobiotechnology. As nanotechnology advances the creation of novel materials and drug delivery systems 80,000 times smaller than the thickness of a human hair, it will fall to experts in biotechnology to determine their safety and biocompatibility.

UNCG researchers are already operating productively at nanoscales. One example is the development of a new nanodevice for handling biological samples, which will improve the measurements of the biological samples by using mass spectrometry. Another is the identification and isolation of alkylamides—components of “folk” medicines such as

Echinacea—and their binding properties at receptor sites that modulate responses of the immune system. Other possible applications of nanobiotechnology include engineering biomolecules for non-biological uses such as DNA-based computer circuits and medical diagnostics, areas in which UNCG has appropriate resources for innovative research and discovery.

Corporate Investment in the Triad

Honda Aircraft Company Inc., a subsidiary of Honda Motor Co., will establish its world headquarters at the Piedmont Triad International airport. The company has also announced plans to build a manufacturing facility at the airport where it will produce its advanced, lightweight private business jet, HondaJet, and explore advancements in aviation utilizing nanotechnology. The company's headquarters facility, hangar, and manufacturing plant will employ more than 300 engineering, sales and marketing, manufacturing, and support personnel by the time the manufacturing plant reaches full capacity. The company will invest up to \$100 million. The cities of Greensboro and High Point, along with the Winston-Salem Alliance and Guilford County, jointly supported the project which was awarded a Job Development Investment Grant from the state of North Carolina.

VF Corporation, the world's largest apparel company with well-known brands such as Wrangler, Lee, Nautica, The North Face, JanSport, and Vans and Reef, relocated its corporate headquarters from Pennsylvania to Greensboro 10 years ago. The majority of its 2,000-plus employees in North Carolina are knowledge workers focused on providing product development, marketing research, and information technology for the VF Corporation brands. VF already uses nanotechnology in several products with flame resistant and stain resistant features, as the possibilities for applying nanotechnology begin to increase within the apparel industry. Mackey McDonald, chairman and CEO of VF Corporation, said, "Nanotechnology is a fast-growing field, and we have a unique, yet small window of opportunity to position Greensboro, the Triad, and North Carolina at the forefront of the industry."

Gateway University Research Park represents the academic, corporate, public, and private meeting of the minds to collaborate for technological growth and advancement in the Triad. Creating and developing partnerships with private and corporate sponsors, educational institutions, and federal and state agencies is an important pathway to fulfill the mission of the research park.

In the race for first place, corporations are striving to win, and both cities and regions are sprinting to secure a spot on the winners' platform to showcase their research to the world. Explosive growth in fundamental research, development, and commercialization of biotechnology, nanotechnology, and genomics is affecting almost every industrial sector worldwide. These evolving fields are seen as providing stepping-stones to technical advancements that will positively impact the economy, workforce, existing industries, and society. Gateway University Research Park will provide the Triad community with a facility that will prominently place them in the race for the best technology and knowledge-driven innovations. Indeed, the tides of change are sweeping over the Triad, and Gateway University Research Park is leading the way.