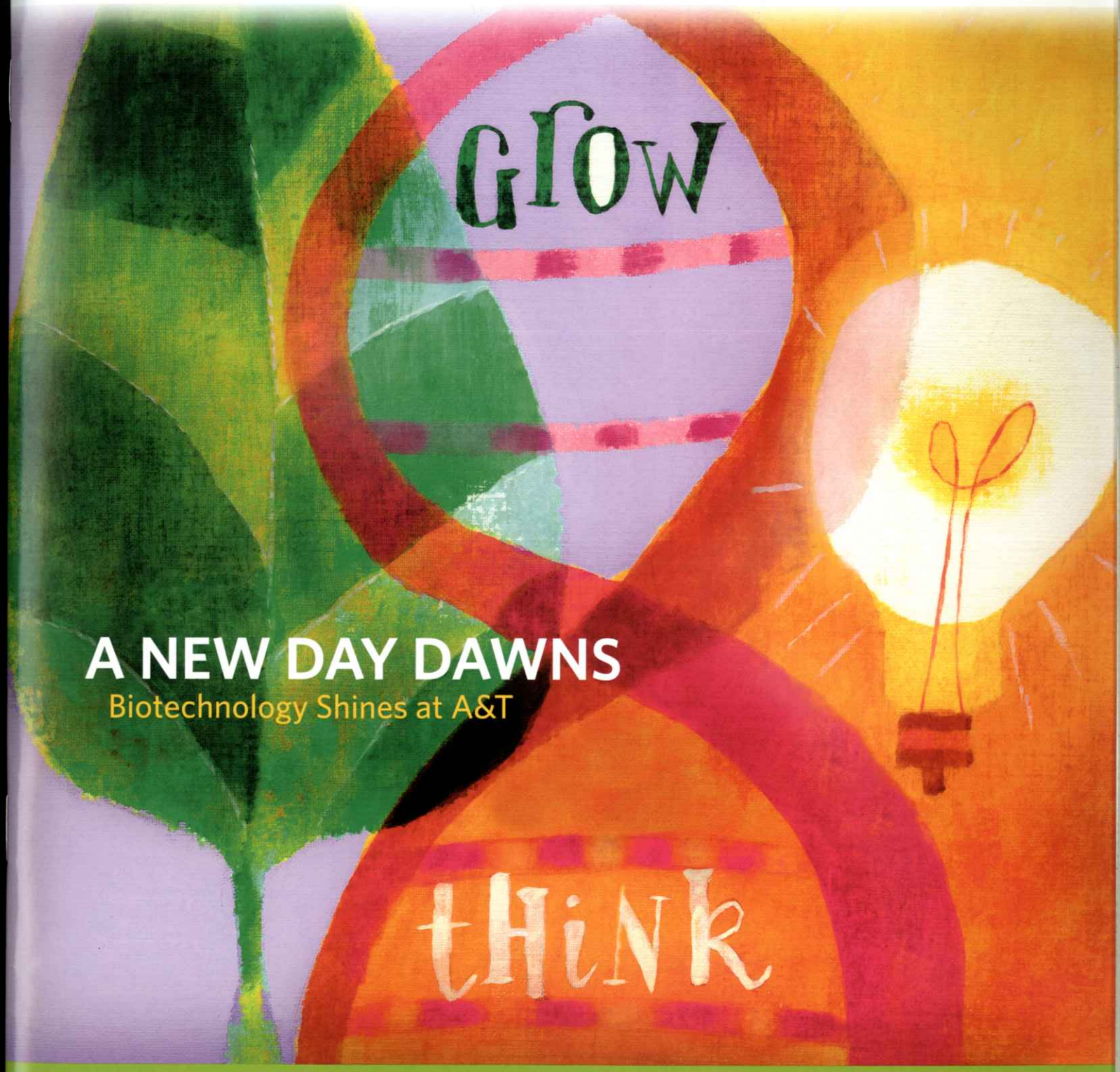
Evolution

NORTH CAROLINA A&T STATE UNIVERSITY

>> RESEARCH MOVING FORWARD



A NEW DAY DAWNS

Biotechnology Shines at A&T

INSIDE

SPIN-OFF COMPANIES at A&T > TOP RESEARCHERS Honored > RESEARCH News > FACULTY Research

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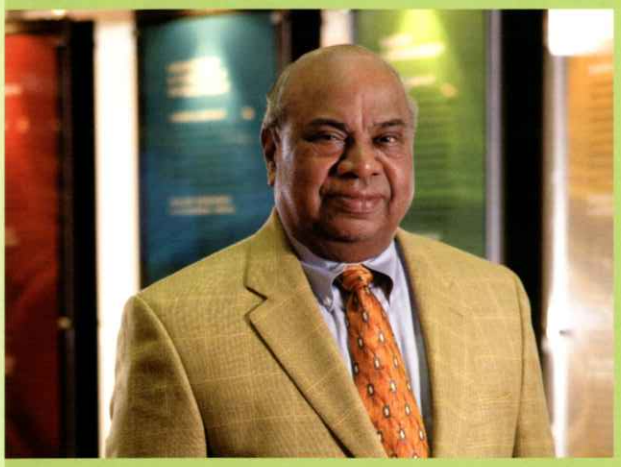

As a major research university,

North Carolina A&T State University has a unique role in the creation and sharing of knowledge. Teaching, research and public service are linked through programs designed to expand and transmit knowledge. Effective teaching encourages the intellectual development of both student and teacher; and quality research introduces students to the excitement of original discovery.

This issue of *Evolution* focuses on the exciting research being done by A&T biotechnologists. Today, there is a growing recognition that biotechnology will impact all aspects of life in this century and beyond. Biotechnologists on A&T's campus are integrating teaching and research as they develop highly productive interdisciplinary research in microbial, plant, and animal systems — as well as genetics with relevance to human health.

Researchers at North Carolina A&T are working efficiently and effectively to create a research-driven infrastructure that will stimulate innovation, cultivate creativity and discovery and support our mission as a land-grant university. With cutting-edge research in areas such as plant tissue culture micropropogation and developing a non-allergenic peanut, scientists at A&T are leading the way.

We are also very proud and excited that our College of Engineering will be hosting a National Science Foundation sponsored conference, *Bridges to Engineering–2020* in March 2008, which will bring together deans and faculty from engineering schools across the country to discuss meaningful collaborations and partnerships.

We hope you enjoy this issue of *Evolution*.

Sincerely,

N. RADHAKRISHNAN, PH.D., P.E.
Vice Chancellor for Research & Economic Development

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NORTH CAROLINA A&T STATE UNIVERSITY

FEATURES

6 A NEW DAY DAWNS
Biotechnology Shines at A&T

10 A VIRTUOUS CIRCLE
Spin-off Companies Benefit Society, Researchers, and the University

DEPARTMENTS

2 A&T News
A&T Licenses Important Bridge-Safety Technology; A&T to Host National Research Conference; Food Scientist Eliminates Allergens in Peanuts; Third in Research Funding; Top Researchers Honored

16 Current Research at A&T
S.E.E.K. — *Strengthening Economies by Expanding Knowledge*

- ADVANCED MATERIALS & NANOTECHNOLOGY
- COMPUTATIONAL SCIENCE & ENGINEERING
- BIOSCIENCES & BIOTECHNOLOGY
- ENERGY & ENVIRONMENT
- LOGISTICS & TRANSPORTATION SYSTEMS
- PUBLIC HEALTH
- INFORMATION SCIENCES & TECHNOLOGY
- LEADERSHIP & COMMUNITY DEVELOPMENT

20 Faculty Watch
Dr. Goldie Byrd; Dr. Salam Ibrahim; Dr. Shamsuddin Ilias; Dr. Jianzhong Lou; Dr. Mary Smith; Dr. Mulumebet "Millie" Worku

27 Undergraduate Research Experience
Lillian Galloway; Students Attend Minority Conference

A&T LICENSES IMPORTANT BRIDGE SAFETY TECHNOLOGY

A NORTH CAROLINA A&T State University professor has developed a technology that could have possibly prevented the 2007 bridge collapse in Minneapolis, Minnesota.

Dr. Mannur Sundaresan, professor of mechanical engineering, has developed a single-channel continuous sensor that has the potential to detect and locate early crack growth in structures, thereby providing timely information to prevent catastrophic failures. This single-channel continuous sensor can detect the leading edge of the acoustic emission event, anywhere it occurs in the region covered by the sensor.

Essentially, the technology involves using commercially available sensors, deployed in a unique configuration, to acoustically monitor structural integrity. It does this by remotely detecting and addressing standard flaws via acoustic emission signals.

According to Sundaresan, the technology operates like the body's nervous system. "If you're hurt, the nervous system lets you know right away. That doesn't happen with a structure. An inspector has to go look. With small cracks, it's like finding a needle in a haystack. Small cracks are like cancer. They're usually not noticed until they've grown large enough to cause serious damage. These sensors will detect the growth of cracks in their early stages just as our nervous system alerts us of any injury immediately so that we can take action to limit the damage."

Sundaresan's technology, originally funded by the Department of Defense, is licensed by UTEK Corporation.

"This is technology that could potentially save lives," says Dr. N. Radhakrishan, vice chancellor for research and economic development and a civil engineer. "It is applicable to all structures and equipment which need to monitor and measure metal fatigue cracks and crack propagation. Our research faculty at A&T is among the best in the world. Dr. Sundaresan is an internationally recognized authority on structural health monitoring."

Sundaresan holds two patents for his acoustic emission sensoring technology and has one patent pending.

A&T to host national research conference

ON MARCH 12-14, 2008, North Carolina A&T State University's College of Engineering will host the *Bridges to Engineering–2020: Foundation for National Partnerships* conference. Its aim is to synergize efforts in engineering education and research through new partnerships — partnerships conceived by young diverse leaders in this field.

A&T was chosen to plan, organize and conduct this major national conference to expose majority institutions to the wealth of engineering talent on its campus and at other HBCUs with engineering schools. Sponsored by the National Science Foundation, *Bridges to Engineering* will highlight opportunities for members of these diverse institutions of higher education in the United States to share ideas and expertise in emerging areas of engineering research.

This focus is especially relevant in light of current interest in the state of science and technology education. While African Americans represent about 12 percent of the U.S. population, they constitute fewer than 3 percent of U.S. scientists and engineers, according to the National Science Foundation. And although HBCUs constitute only 15 percent of U.S. colleges and universities, they graduate 30 percent of all African Americans who earn bachelor's degrees in engineering and nearly 50 percent of African American students who go on to attend graduate school. More specifically, North Carolina A&T is first in the United States in producing African Americans with bachelor's degrees in engineering, second in producing African Americans with master's degrees in engineering, second in the number of tenure-track African American faculty members, and fifth in the percentage of engineering degrees awarded to women.

Bridges to Engineering presents a unique opportunity for North Carolina A&T and the conference attendees. Over 150 people are expected to attend, including deans and provosts of major engineering schools across the country as well as faculty members from those schools. Representatives of many major engineering firms in the country will participate in a panel discussion focusing on industry needs.

The universities and industry representatives in attendance represent the forefront of engineering research, both nationally and worldwide. The Conference's dual foci — stating the research challenges in engineering for the next two decades and developing plans for collaboration among the represented universities — will have potential for both short-term and long-term economic impact.

Bridges to Engineering will bring together eminent young researchers in six identified areas of engineering research: advanced materials & nanotechnology; sensors; logistics & transportation; energy & environment; computational science & engineering; and healthcare. All of these areas are expected to remain or grow vital for the next fifteen years.

For more information, e-mail ber2020@ncat.edu.