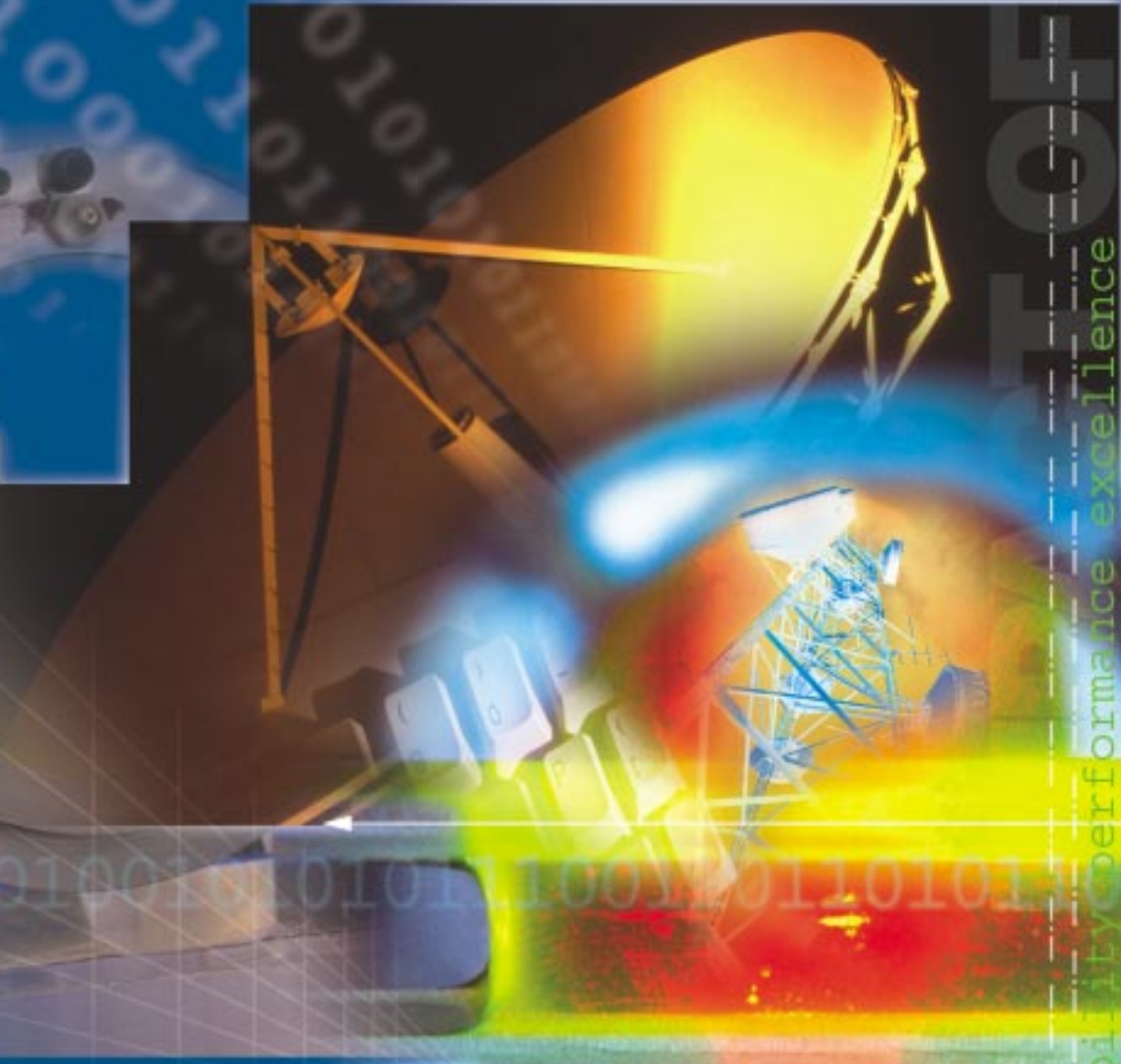


SCIENCE | MATHEMATICS | ENGINEERING | TECHNOLOGY IMPACT

North Carolina  
H&T State University

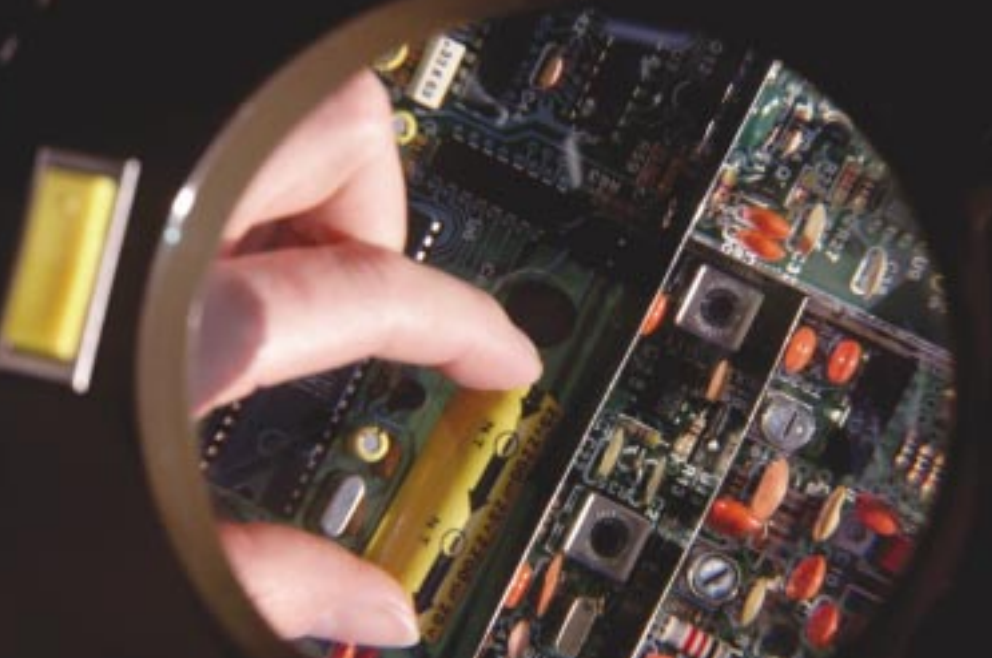


accountability performance excellence



Science and Technology for America





## “Mens et manus” Minds and hands.

This motto has represented North Carolina A&T for well over 100 years, and during that time we have put many minds and hands to work for a common good. Whether we are improving the technology used in modern manufacturing processes or helping flood-stricken farmers in rural North Carolina, the faculty and students of our science, math, engineering and technology programs continue to make positive contributions all over the state, the nation and the world.

## Our mission is clear:

North Carolina A&T stands as a competitive institution and a forerunner in quality education. Built on a rich tradition that holds strong academic values as a standard, A&T's purpose is to give students the benefits of an exemplary undergraduate, graduate or doctoral education and prepare them for roles of leadership and service. Paramount to our purpose is our newly established planning and resource council, FUTURES. This council supports constant innovations that capitalize on the university's extensive resources and plans what courses of action will be most effective in meeting future challenges. This awareness to pro-active planning allows North Carolina A&T to remain true to its high standards, further encompassing its identity as an institution dedicated to higher learning.

Our achievements are built on the solid foundation of a rich and unique history, including our heritage as a land-grant institution. In 1891, the General Assembly of North Carolina introduced an act to create the A&M College. The act read in part: “That the leading object of the institution shall be to teach practical agriculture and the mechanic arts and such branches of learning as relate thereto, not excluding academical and classical instruction.”

The first building was completed in 1893, and the college opened in Greensboro during the fall of that year. The name was changed to The Agricultural and Technical College of North Carolina in 1915.

We have adapted over the years to ensure our science, math, engineering and technology students keep pace in a changing world. We encourage our students to dream and set goals. Then we equip them so they're prepared to succeed. When a kernel of a dream exists, North Carolina A&T nourishes it to fruition so that each student experiences success.

At North Carolina A&T State University, we are changing the world one student at a time.

## Our commitment:

Our commitment to quality education is a continuous pledge to educate graduates in the areas of science, mathematics, engineering, and technology (SMET). The FUTURES Planning and Resource Council serves to ensure that our array of well-organized and productive pipeline programs, accredited academic programs in the SMET areas, and research programs facilitate the teaching and learning process to its greatest capacity. This combination upholds A&T's reputation as a leading institution in producing graduates that have a positive impact on America.

“North Carolina A&T State University produces more Black engineers than any school in America.”

from *Black Issues in Higher Education*, December 2000

**Dr. Alfred Burress**

Project Manager, IBM  
MS Electrical Engineering, '94  
Ph.D. Electrical Engineering, '98

*“At North Carolina A&T, I obtained both a quality education and a vast amount of the administrative skills necessary to move forward in Corporate America. I thank the welcomed interface with the faculty, staff and administrators at all levels at the university for my success.”*



Engineering and Technology

The Edge In Science, Mathematics, Engineering and Technology



# North Carolina A&T Pipeline Programs

**North Carolina A&T State University supports many programs to encourage students to enter the Science, Mathematics, Engineering and Technology careers.**

## GAMSEC

The Greensboro Mathematics and Science Education Center (GAMSEC), a partnership between A&T and area public schools, is designed to improve the quality of math and science teaching and learning in the Piedmont's public schools. It works with schools in 11 counties to plan courses, summer institutes, workshops, field trips and other professional development programs for public school teachers.

GAMSEC, which is sponsored by the Greensboro Area Mathematics and Science Consortium, also offers programs for students in grades 6-12, including a Summer Scholars Program and Saturday Academy. GAMSEC has a 12-month program for grades 6 - 12, operated through school systems, for students who are from disadvantaged backgrounds, single-parent households, first-generation college families



*Student conducting research with her mentor.*



*Environmental studies at the coast.*

or school underachievers. The Summer Scholars Program features a four-week summer session (100 hours) of math/science, computer programming, problem solving, and accelerated communication courses. Students have the opportunity to take part in this program only if they attend a partner school.

Contact: Dr. Vallie Guthrie, e-mail: gamsec@ncat.edu

## NASA Sharp Plus

The NASA Summer High School Apprenticeship Research Program (SHARP) Plus is an eight-week research-based mentorship program for high school students who are at least 16 years old.

A&T, with NASA, conducts the program which enables participants to gain hands-on research experience while living on A&T's campus. The goal is to increase matriculations and success rates of students who are under-represented in challenging math and science pre-college courses in order to increase the number of these students who major in math, science and engineering in



*Hands-on Science*

college. During SHARP Plus, which is conducted by the Quality Education for Minorities (QEM) Network, students carry out research assignments, prepare reports, make oral presentations and take part in a variety of enrichment activities under the supervision of the A&T SHARP PLUS faculty coordinator and staff.

Contact: Dr. Vallie Guthrie, e-mail: gamsec@ncat.edu

## TALENT-21

Called the "Gateway for Advance Science and Mathematics Talent," The TALENT-21 Program is a comprehensive academic enhancement project for full-time students pursuing degrees in science, mathematics, engineering and technology (SMET). It is designed primarily to promote SMET majors and careers among minority students. Funded by the National Science Foundation HBCU-UP Program, TALENT-21 features scholarships, awards, summer institutes, research training programs and professional development. It also offers a pre-college program, including a Saturday Academy and a Summer Scholars Program.

Contact: Ms. Sunnie Howard, e-mail: sunnie@ncat.edu

## The Waste Management Institute (WMI)

The WMI is an academic support unit at A&T with a two fold-mission: to increase an awareness and understanding of environmental and waste-management issues and to augment collaborative environmental instruction, research and outreach needed to improve the quality of life and protect the environment. The WMI administers a certificate program in waste management for all academic majors of the university. In addition, the WMI is a leader in funded collaborative environmental programs, with \$2 million for educational and research activities and \$18 million for the inter-institutional Science and Technology Center for Environmentally Responsible Solvents and Processes (with UNC-CH, NCSU and UT-Austin).

Contact: Dr. Godfrey Uzochukwu, e-mail: uzo@ncat.edu

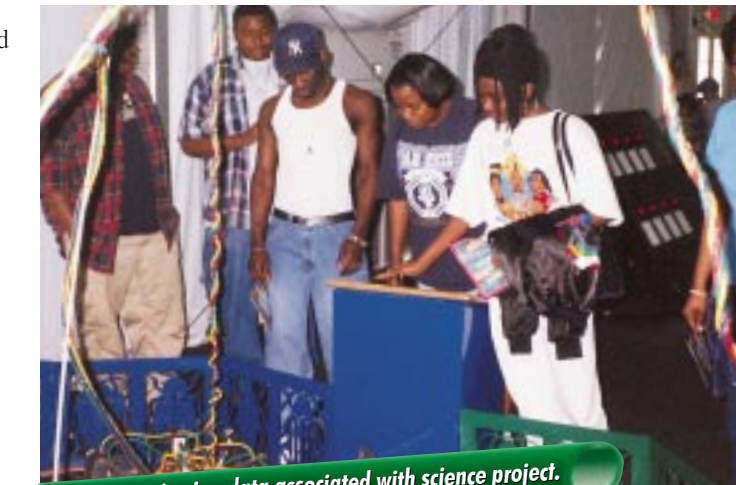


*Research training in fundamentals of science.*

## Upward Bound

A&T's Upward Bound Program is a year-round academic program designed to help students finish high school and succeed in college. It includes a six-week residential session during the summer, a nine-month tutorial session during the academic year, and a bridge program for Upward Bound graduates during the second summer session. Services include instruction, tutoring, counseling, sponsorships for cultural activities, career development activities and more.

A&T has formed a partnership with the University of North Carolina at Greensboro to provide these services, with each university alternating as a site for the programs, giving participants the opportunity to experience college life in two university settings.



*Students reviewing data associated with science project.*

Contact: Ms. Beverly Wallace, e-mail: beverlyw@ncat.edu

## Para-Researcher Program (PRP)

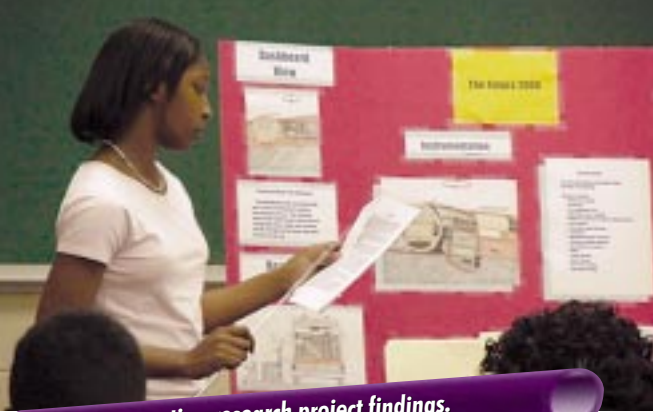
This program is designed to give high school students (rising 9th through 12th grade) who

aspire to be engineers a head start by exposing them to the human-machine systems engineering (HMSE) and manufacturing engineering in the Industrial Engineering Department. The PRP is a two-week program that consists of laboratory activities,



*Students on-site studying water quality.*





Student presenting research project findings.

demonstrations, and a plant tour. Activities include hands-on experience in state-of-the-art laboratories on virtual reality; robotics; eye-tracking technology; the automated manufacturing cell; an introduction to the Internet, and human-computer interface. The program, sponsored by the Industrial Engineering Department, is available only during the summer session.

Contact: Mrs. Gwendolyn Fuller, e-mail: gfuller@ncat.edu

### Student Support Services

The goal of Student Support Services is to provide support for 175 educationally disadvantaged students who want to gain admission to, be successful at, and graduate from A&T. We provide free tutoring, counseling, office services and cultural arts activities to eligible students.

Contact: Mr. Charlie Williams, Jr., e-mail: wilc@ncat.edu

### Summer High School Transportation Institute

Sponsored by the Transportation Institute of the School of Business and Economics, this summer program



2000 SHSTI participants visit pavement testing site.

increases an awareness of the attractive career choices and opportunities within the transportation industry. It is designed to broaden the pool of potential applicants – especially women and minorities – who will be available for transportation education at the university level. The Institute, which gives participants opportunities to interact with transportation professionals, is open to rising juniors or seniors with a GPA of 2.5 or better on a 4.0 scale. The program includes career exploration activities and a for-credit college English course.

Contact: Mrs. Deborah Underwood, e-mail: deborahu@ncat.edu

### Institute for Future Agricultural Leaders

This one-week residential program, sponsored by the School of Agriculture and Environmental and Allied Sciences, is designed for high school juniors and seniors. The goal is to develop future leaders in the agricultural, environmental and natural resources fields. Students are exposed to career opportunities in agriculture, environmental and food science. Participating students, who earn modest wages,



IFAL participants visit with former Governor Hunt.

receive an orientation to academic programs in the School of Agriculture and Environmental and Allied Sciences in conjunction with tours of research libraries and agri-businesses. In addition, students gain leadership experience by participating in leadership training seminars, touring the N.C. General Assembly, meeting government officials and visiting the N.C. Farm Bureau offices.

Contact: Dr. Alton Thompson, e-mail: altonth@ncat.edu

### Careers in Agriculture and Natural Sciences (ICAN) For High School Students

ICAN is a one-week residential program for high school sophomores, juniors and seniors designed to introduce students to some of the hundreds of careers open to graduates with interests in natural resource management and the food, agricultural and environmental sciences. Sponsored by the School of Agriculture and Environmental and Allied Sciences and a USDA Capacity Building Grant, ICAN also provides a preview of college life. Through the program, students gain exposure to state-of-the-art scientific equipment, progressive technology and

## NC A&T Pipeline Programs Student Participation 1990 – 2001



cutting edge research in agriculture. They also participate in structured activities including field trips, workshops and laboratory demonstrations. The program pays all expenses for qualified students, including room, board, activity fees, and health and accident insurance.

Contact: Mrs. Azell Reeves, e-mail: reevesi@ncat.edu

### NC-LSAMP

A&T is the lead university in the eight-college alliance that makes up the North Carolina Louis Stokes Alliance for Minority Participation (NC-LAMP). The main goal of the alliance is to substantially increase the number of under-represented minority students who earn a bachelor's degree and then pursue a master's degree and doctorate in science, mathematics, engineering and technology (SMET). Since 1996, the program has seen a 25 percent increase in SMET degrees by minorities, including a 67 percent gain by Hispanic Americans, a 23 percent gain by African Americans and a 22 percent gain by Native Americans. The program includes tutoring, distance learning, hands-on instructional activities, collaborative learning, peer student groups, summer research programs, faculty and peer mentoring programs, a summer bridge program, internships, career counseling and scholarship programs. The member universities in the alliance with A&T are: Fayetteville State University,

North Carolina Central University, North Carolina State University, UNC-Chapel Hill, UNC-Charlotte, UNC-Pembroke and Winston-Salem State University.

Contact: Dr. Vivian Hampton, e-mail: vivian@ncat.edu

### Annual Life and Physical Sciences Research Symposium

The Symposium is an annual one-day event that highlights current issues in science. It strives to inspire students to engage in scientific discovery and gives them opportunities to share their research experiences with others. It also provides students with the chance to interact with accomplished scientists at the symposium. Every year, A&T invites a prominent scientist to advance the objectives of our program. The program also includes poster and oral presentations by faculty and students, graduate school exhibits, panel discussions, faculty recognition programs and science vendor displays. The day culminates with a banquet for faculty, students, administrators and community leaders.

Contact: Dr. Mary A. Smith and Dr. Doretha B. Foushee  
e-mail: smithma@ncat.edu and foushee@ncat.edu



Students discussing post-session papers.



## EMPACC

The Engineering, Mathematics, Physics and Chemistry Coalition (EMPACC) scholars program is a joint academic program between the College of Engineering and the College of Arts and Sciences for undergraduate students majoring in science, engineering and mathematics. Its goal is to increase the number of students who want to pursue a doctorate in physics, chemistry, mathematics or computer science, or in the fields of industrial, chemical, mechanical or electrical engineering. EMPACC achieves these goals by providing support and enrichment activities to targeted students throughout their undergraduate studies, preparing them for the next level. The students are selected by the respective departments.

Contact: Mr. Leotis Parrish, e-mail: parrish@ncat.edu

## MAH and PAH College Initiative

The Mothers at the Helm (MAH) and Papas at the Helm (PAH) College Initiative (GEAR-UP) is a new program designed to reduce poverty and improve educational levels in nearby manufacturing communities through intervention efforts for middle-age students, particularly those in the sixth grade. The program combines greater parental involvement with rigorous courses that prepare students for college, strengthening academic readiness while simultaneously improving the students' support network. The initiative features intervention strategies that include tutoring, mentoring, financial assistance sessions, cultural enrichment, dissemination of college information and workshops for teachers and guidance counselors.

Contact: Dr. Miriam Wagner, e-mail: wagnerm@ncat.edu

## Higher Learning Institute

Sponsored by the Office of Continuing Studies & Distance Learning, this program provides an opportunity for high school juniors and seniors of exceptional ability to enroll in freshman and sophomore level courses at A&T that have no prerequisites. The course credits that are earned are "banked" and available for advance placement in the student's freshman year of college. This project is open to students deemed by their principal or guidance counselor to have the intellectual, social

and emotional maturity to perform successfully in a university environment.

Contact: Mrs. Veronica Ford, e-mail: fordvdf@ncat.edu

## Engineer Starters Program (ESP)

The Engineer Starters Program (ESP) is an outreach program designed to encourage minorities and women to pursue careers in engineering. The curriculum includes mathematics, science, computers, engineering design, problem solving and career exploration. This non-resident program, sponsored by A&T's College of Engineering, essentially operates during the morning hours except on days when the participants travel on educational field trips. Applicants must be rising seventh-through twelfth-graders.

Contact: Mr. Vernal Alford, e-mail: vga3@ncat.edu

## Summer Institute: The Family Life Empowerment Center (FLEC) Future Nurse / Health Careers Club

This three-week program, sponsored by the School of Nursing, is for male and female high school students who are recruited from local high schools participating in the FLEC program. The institute explores health careers and implements strategies through academic development, personal development, cultural/recreational enrichment and career development.

Contact: Ms. Jennifer Bynum, e-mail: bynumj@ncat.edu

## Research Apprenticeship Program (RAP) for High School Students

RAP, a six-week residential program for high school sophomores, juniors and seniors, is designed to stimulate an interest in careers in natural resource management and the food, agricultural and environmental sciences. Through the program, students gain first-hand experience in research conducted under the direction of the school's research scientists. Research projects range from landscape architecture and pesticide studies to air quality and international trade. Students participate in a number of structured activities, including field trips, workshops and laboratory demonstrations, and receive instruction in computer applications, technical and scientific writing, and public speaking. RAP is sponsored by the School of Agriculture and Environmental and Allied Sciences and the Southern Food Systems Education Consortium (SOFSEC).

Contact: Mrs. Azell Reeves, e-mail: reevesi@ncat.edu

# School of Agriculture and Environmental and Allied Sciences

Dean: Dr. Alton Thompson, altont@ncat.edu, 28 full-time faculty, <http://www.ag.ncat.edu/>



Dr. Tracy Hanner and students discuss procedures in animal science laboratory.



## Chandra Meachem

Animal Science, '00

*"The School of Agriculture and the Laboratory Animal Science Program provided me with the academic background to be very competitive in vet school. The small classes, supportive faculty and the staff made me feel very welcome in the department. With their caring and dedicated assistance, I felt that LAS was my home away from home."*

The School of Agriculture and Environmental and Allied Sciences has four distinct departments: Agribusiness, Applied Economics, Agriscience Education and Animal Sciences. The school provides students with the understanding and skills required to address the pressing needs of today's interdependent economic climate and its growing environmental challenges. Advanced technological systems within the school allow professors and students to downlink with programs all around the world. A&T progressively adopts new areas of study including biotechnology, agricultural and environmental systems, global trade relations and satellite communications. Programs are concentrated in agribusiness, agricultural economics and agriscience education. A&T is the first historically black university to offer nationally accredited

undergraduate programs in landscape architecture and agriculture and biosystems engineering, and is one of the few universities in the nation with a program in laboratory animal science/pre-vet. Faculty correlate agricultural research and cooperative extension programs with academic program units. They also fully incorporate into the curriculum state-of-the-art research and hands-on experience to bring the most advanced discoveries to students and their communities.

A special scholarship endowment and a USDA/1890 National Scholars Program provide funds to exceptional students in the School of Agriculture and Environmental and Allied Sciences. The endowment is named for former dean Dr. Burleigh C. Webb, the first person to be honored in A&T's Agricultural Hall of Fame.

A&T's School of Agriculture and Environmental and Allied Sciences is organized in the land-grant university tradition, offering programs — such as agricultural research and cooperative extension programs that aid and educate citizens in the food and agricultural sciences, and other related areas.

Formal agriculture instruction programs have served the state's citizens successfully for more than 100 years. Our faculty, trained in the basic and applied sciences in agriculture and related areas, include scholars whose contributions to instruction, research, and cooperative extension are recognized around the world.





**James W. Mitchell**

**Materials Research Laboratory UP  
Chemical Engineering, '65**

*"At NCA&T, Dr. Pendergrass involved me in a challenging and academically stimulating undergraduate chemistry curriculum along with the excitement of executing undergraduate research with Dr. Edwards. This invigorating environment reinforced my interest and provided me with the confidence and mental toughness required to complete my Ph.D. degree in chemistry."*

# College of Arts and Sciences

Dean: Dr. Phillip Carey, careyp@ncat.edu, full-time science faculty 52, <http://www.ncat.edu/~artsnsci/>

**T**he College of Arts and Sciences is composed of thirteen academic, degree-granting departments and several distinctive programs.

At the undergraduate level, students may earn the bachelor of arts, the bachelor of sciences, the bachelor of fine arts, and the bachelor of social work degree in the general areas of the arts and humanities, the social and behavioral sciences, and the natural and physical sciences. The college also offers several master's degrees in biology, chemistry, English, history, mathematics, physics and social work. Many degree programs may be pursued jointly with professional education courses offered in the School of Education. Graduates of these programs qualify for certification to teach in the secondary schools.

In addition, the Mathematics and Physics Departments have degree programs in applied mathematics and engineering physics in association with the School of Engineering.

We are extremely proud of the fact that the college excels in helping ordinary students achieve extraordinary results. Dedicated and competent faculty members inspire students to develop a strong background for rewarding careers. To ease the transition into the workplace or graduate school, we encourage our students to participate in internships, the Lyceum series, practicums, seminars and workshops. All science majors are required to master basic laboratory techniques and procedures, computers and related informational technologies.

# College of Engineering

Dean: Dr. Joseph Monroe, monroe@ncat.edu, 64 full-time faculty, <http://www.eng.ncat.edu/>

**C**ollege of Engineering students prepare for their careers by acquiring a basic knowledge of the mathematical and natural sciences upon which the practice of engineering and computer science depend, as well as a comprehensive background in all phases of the design process, including conception, planning, synthesis, analysis, design, and management. We help students develop the judgment they will need in their work and encourage in them an appreciation for the process of continuing education. We also strive to develop the intellectual, professional, and social characteristics of our students to enable them to become responsible leaders in their communities.

The College of Engineering grants bachelor of science degrees and master's degrees in agricultural and biosystems engineering; architectural engineering;

chemical engineering; civil and environmental engineering; computer science, electrical and computer engineering; industrial and systems engineering; and mechanical engineering. Doctorates are offered in electrical and mechanical engineering. Doctorates are available in most other engineering disciplines through an inter-institutional program between North Carolina State University and North Carolina A&T State University.

All of our undergraduate engineering programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC-ABET) and the computer science program is accredited by the Computer Science Accreditation Commission (CSAC) of the Computer Science Accreditation Board.



**Kendra Hill**

**Software Engineer, G.E. Power Systems  
Computer Science, '00**

*"NC A&T State University gave me an excellent education in the field of Computer Science that allowed me to be competitive in Corporate America, to form life-long friendships, to experience intense leadership experiences, and to renew my commitment to my community, my family, and those that will follow."*

A&T students earning bachelor's or master's degrees in science for biology, chemistry, mathematics or physics are among the best prepared and most successful scientists in the country. Over the years, the College of Arts and Sciences has distinguished itself as one of the nation's leaders in producing scientists who are women or members of minority groups. Most of our science graduates continue their studies at some of the most prestigious graduate schools in the nation. Those who choose not to pursue further studies often start their careers with one of the many research institutions, businesses or government agencies that recruit here and hire a significant number of our students. Our science programs are fully accredited and nationally recognized.



*Dr. Floyd James explains how to read a star chart.*



*Chemical engineering majors work in a chemical lab.*

Ten percent of the African Americans with engineering degrees in the United States are graduates of North Carolina A&T State University — higher than the percentage from any other school in America. We hold firmly to our motto of being considered "a national resource and a local treasure," and we are committed to expanding our educational and research programs to meet the growing needs of our region, state and nation. In state-of-the-art facilities, our faculty members continually develop innovative curricula and creative research to stimulate student interest in learning. Our graduates are highly regarded and sought-after by industry and government, as well as by graduate and professional schools across the country.





**Don Estler**

NC A&T Associate Professor of Manufacturing Systems BS '97, MS '98

"I am a two-time graduate of North Carolina A&T State University and received an excellent education at both the BS and MS levels. The students and faculty are friendly and warm and I am now proud to call myself an AGGIE!"

A&T's School of Technology ranks among the nation's top producers of technology graduates. We graduate more African American students in the industrial technology professions than any other college or university in the country. The school was established in 1986 to provide qualified technical-management personnel, educators and administrators to apply and manage technology in a variety of industries and educational institutions. The school is committed to educating a workforce capable of meeting the expanding challenges of high technology.

# School of Technology

Dean: Dr. Elazer Barnette, barnette@ncat.edu, 26 full-time faculty, <http://www.ncat.edu/~sot/>

**93** % of our Technology faculty hold doctoral degrees from some of the country's finest universities. Our new, state-of-the art, high-tech facility – with 54,733 square feet, 16 laboratories, and a student computer center – features a computerized teleconferencing complex for distance learning capabilities. The School of Technology's size and resource commitment place it in the top five percent in the nation. Students who major in the school's programs have opportunities to work with cutting-edge technological equipment and earn internship opportunities with major companies.

Our primary focus in the School of Technology is to prepare students to be proficient in the application of basic science and technology. For this reason, our faculty makes a point of knowing what leaders in industry, business and education want and need in our graduates. We strive to educate the whole person. Students develop not only their technical skills but also their spirit of cooperation and innovation, their concern for the organization, and their communications skills. Graduates are equipped to meet the new and emerging challenges of a modern, high technological society. The School of Technology offers bachelor's degrees in construction management; electronics technology;

graphic communications; manufacturing systems; occupational safety and health; technology education; and vocational and industrial education. The school also offers master's degrees in industrial technology with a specialization in each of the departments; technology education and vocational industrial education. Also, the School of Technology is a member of the Indiana State's University School of Technology Consortium Degree Program that offers a doctorate in technology management with specializations in construction management; digital communications; human resource development and training; and manufacturing systems and quality systems.

All programs in the school are accredited by their learned societies. The National Association of Industrial Technology (NAIT) accredits all industrial technology programs in the school, and the National Council for the Accreditation of Teacher Education (NCATE) accredits all education-related programs. In addition to reviews by the two accrediting organizations, advisory groups associated with various professional organizations that support all academic programs in the school continually review curricula and programs in the school.

# Division of Research

Vice-Chancellor for Research: Dr. Earnestine Psalmonds, ep@ncat.edu, <http://dor.ncat.edu/>

## Research Centers and Institutes

- Center for Aerospace Research
- Center for Composite Materials Research
- Center for Advanced Materials and Smart Structures
- Center for Energy Research and Technology
- Center for Environmental Remediation and Pollution Prevention
- Center for International Trade
- National Center for Workforce Preparation for Underserved Populations
- Agromedicine Institute
- Civil Infrastructure Institute
- Institute for Human-Machine Studies
- Transportation Institute
- Waste Management Institute
- Piedmont Triad Center for Advanced Manufacturing
- Edward B. Fort Interdisciplinary Research Center

## Sponsored Project Awards / FY 1999 - 2000

School of Agriculture and Environmental Sciences .....	\$3,870,722
College of Arts and Sciences .....	\$2,714,676
School of Business and Economics .....	\$361,841
School of Education .....	\$950,422
College of Engineering .....	\$11,295,503
School of Nursing .....	\$284,067
School of Technology .....	\$530,366
School of Graduate Studies .....	\$1,047,910
Administrative Units .....	\$5,191,575
TOTAL .....	\$26,247,082

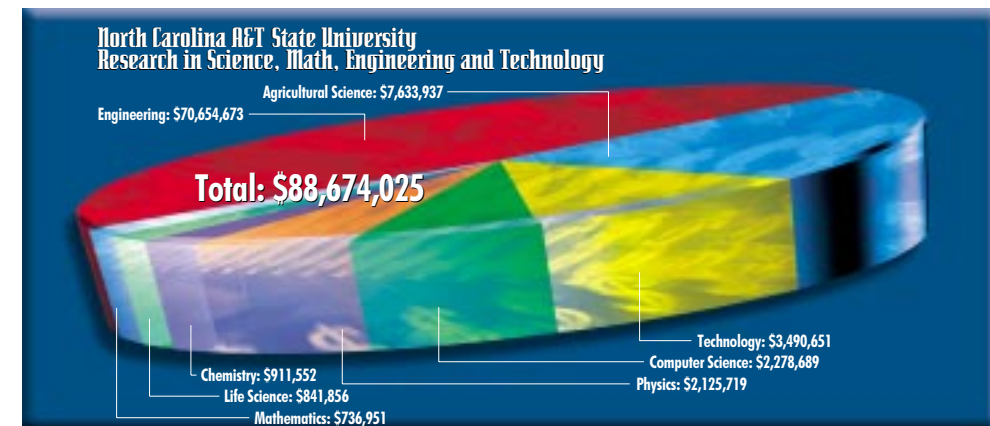
## Sponsored Project Awards by Sponsor Type / FY 1999 - 2000

Federal Agencies .....	\$21,164,853
Foundations .....	\$318,000
State and Local Government .....	\$1,318,829
Business and Industry .....	\$266,328
Colleges and Universities.....	\$2,553,101
Other Agencies .....	\$625,971

The major federal sponsors include the Department of Defense (\$2.8 mil), Department of Agriculture (\$2.5 mil), Department of Education (\$5.6 mil), National Aeronautics and Space Administration (\$3.5 mil), and National Science Foundation (\$4.7 mil). The major non-federal sponsors include the State of North Carolina (\$1.3 mil) and university partnerships (\$2.5 mil).

## Current Research Capabilities and Projects

Research at North Carolina A&T State University is based on a balanced and diverse portfolio of basic and applied research programs that effectively integrate with graduate and undergraduate education. These programs have evolved into a number of robust interdisciplinary research centers and institutes, specialized research laboratories,



and partnerships that sustain the university's core strengths and continue to enhance its competitive advantages. Each center specializes in a different set of focused research topics, some of which are listed here.

For example, the **Center for Aerospace Research** performs research and development in aerospace structures, computational fluid dynamics, guidance and controls, and propulsion. The **Center for Composite Materials Research** works in the areas of polymeric and carbon/carbon composites, resin transfer molding, and nondestructive evaluation of materials. The **Center for Advanced Materials and Smart Structures** concentrates on research in advanced ceramics and composites, electronic ceramics, sensors and smart structures, and semiconductor materials and devices. And the **Center for Autonomous Control Engineering** works on artificial intelligence, fuzzy logic, robotics, neural networks, machine learning, computer vision, and intelligent/adaptive controls.

Researchers in the **Institute for Human-Machine Studies** explore situation awareness, information display and visualization, human reliability and performance, human-computer interaction and cognitive engineering, decision support systems and simulation, neuro-ergonomics, free-flight simulation and work/load modeling.

The **Center for Energy Research and Technology** researches indoor air quality, lighting and

electrical systems, demand filtration and ventilation, energy efficiency, and gas cooling systems. The **Waste Management Institute** approaches environmental issues from a different perspective, being concerned with the fate and transport of hazardous chemicals, site characterization and environmental remediation, water and wastewater treatment and planning, and hazardous waste treatment and decontamination.

Finally, the **Transportation Institute** focuses on global operations and logistics, public policy formation, intelligent mass transportation systems, multi-modal transportation alternatives, transportation logistics, and improving transportation performance in small urban and rural areas.

These are just a few highlights from the truly wide variety of ongoing research and development efforts performed by NC A&T's research centers and institutes. The Chancellor's FUTURES initiative sets the foundation for even more interdisciplinary research: as a group, the university has decided to become a premier interdisciplinary research institution with focused research thrusts represented by inter- and multidisciplinary research centers and institutes.

These centers and institutes offer undergraduate and graduate research opportunities that seamlessly integrate conventional education and training with innovative professional and intellectual development, furnishing A&T graduates with note-worthy comparative advantages for future career prospects.



Dr. Earnest Walker discusses technology concepts with students.



## Science, Mathematics, Engineering & Technology Degree Programs

BS Degree program	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Total	Average
Agricultural Sciences	18	25	20	28	21	35	42	27	38	49	44	52	399	33
Life Sciences	13	8	22	19	17	37	33	36	33	29	23	30	300	25
Architectural Engineering	6	18	8	11	14	29	22	35	26	23	18	14	224	19
Chemical Engineering	12	9	9	17	26	32	34	34	37	37	25	11	283	24
Civil & Environmental Engineering	2	6	7	13	15	13	38	27	20	13	7	12	173	14
Computer Science	28	41	35	43	39	44	41	39	45	52	54	55	516	43
Electrical Engineering	55	52	56	74	63	76	77	49	57	53	38	46	696	58
Industrial Engineering	25	25	28	24	21	30	28	31	24	20	26	24	306	26
Mechanical Engineering	30	25	32	32	35	58	62	79	42	46	41	34	516	43
Mathematics	7	6	8	16	12	10	11	13	9	11	9	10	122	10
Physics & Chemistry	7	10	9	8	10	15	10	16	15	9	9	8	126	11
Construction Mgmt. & Safety	13	8	13	13	19	18	22	22	29	27	30	24	238	20
Electronics & Computer Tech	61	35	36	39	46	53	73	50	58	43	50	39	583	49
Graphics & Communication Tech	13	12	6	8	8	11	15	20	24	22	28	43	210	18
Manufacturing Systems	28	30	30	28	17	23	18	20	24	21	21	13	273	23
<b>Accumulative Totals</b>	<b>318</b>	<b>628</b>	<b>947</b>	<b>1320</b>	<b>1683</b>	<b>2167</b>	<b>2693</b>	<b>3191</b>	<b>3672</b>	<b>4127</b>	<b>4550</b>	<b>415</b>	<b>4965</b>	

MS Degree Program	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Total	Average
Agricultural Sciences	13	6	19	13	11	20	20	16	15	19	10	10	172	14
Life Sciences	1	6	5			4	3	3	1	6	2	5	36	3
Architectural Engineering	2	6	2	2	2	2		1	2	3		1	21	2
Chemical, Civil & Environmental Engineering										4	8	12	24	8
Computer Science						9	20	8	19	23	20	29	128	16
Electrical Engineering	14	9	21	22	17	23	27	12	15	21	17	16	214	18
Industrial Engineering	5	5	5	6	10	8	7	6	15	15	8	8	98	8
Mechanical Engineering	8	6	4	8	10	9	8	6	17	11	6	7	100	8
M.S. in Engineering	3	2	6	2	5	20	5	10	13	9	1	0	76	7
Mathematics	6	3	3	4	4	4	6	4	9	7	9	1	60	5
Physics & Chemistry	5	4	2	4	2	4	3	5	1	4	3	5	42	4
Graphics & Communication Tech	34	14	20	21	7	13	9	14	8	18	11	7	176	15
Manufacturing Systems				1	14	12	9	7	25	18	19	17	122	12
<b>Accumulative Totals</b>	<b>91</b>	<b>152</b>	<b>237</b>	<b>320</b>	<b>402</b>	<b>530</b>	<b>647</b>	<b>739</b>	<b>879</b>	<b>1037</b>	<b>1151</b>	<b>118</b>	<b>1269</b>	

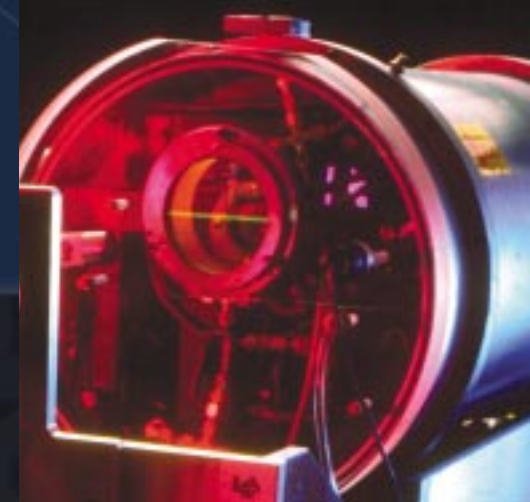
PhD Degree (First degrees awarded in 1998.)	1998	1999	2000	2001	Total	Average
Electrical Engineering	2	3	1	3	9	2
Mechanical Engineering		2	1	3	6	2
<b>Accumulative Totals</b>	<b>2</b>	<b>7</b>	<b>9</b>	<b>9</b>	<b>15</b>	

The pipeline programs provide the university with a steady flow of students in the Science, Mathematics, Engineering and Technology areas. These students enter our academic programs and graduate with BS, MS and Ph.D. degrees in science, mathematics, engineering, and technology. Over the last eleven years from 1990 through 2000 North Carolina A&T has awarded 4550 BS, 1151 MS and 9 PhD degrees to graduates from the Science, Mathematics, Engineering and Technology areas.

## Top companies recruit for North Carolina A&T Science, Mathematics, Engineering & Technology Graduates.

North Carolina A&T's Office of Career Services provides centralized, comprehensive and progressive programs, services and resources designed to prepare our students to successfully pursue meaningful career opportunities. The office centralizes the functions of off-campus student employment (full-time employment, summer jobs, internships, cooperative education, part-time employment, post-graduation employment) and career counseling. Some of the Fortune 500 companies that recruit A&T Science, Math, Engineering and Technology graduates are:

- General Motors Corporation
- Ford Motor Company
- General Electric
- IBM
- AT&T
- Philip Morris U.S.A.
- The Boeing Company
- Bank of America
- Hewlett Packard
- State Farm Insurance Companies
- Sears & Roebuck
- Lucent Technologies
- Proctor & Gamble
- Worldcom (formerly MCI Worldcom)
- Lockheed Martin
- Target Stores
- Verizon Communications (formerly Bell Atlantic)
- Merck
- E.I. de Pont de Nemours
- Johnson & Johnson
- United Parcel Service
- Goldman Sachs
- Dell Computers
- United Technologies
- BellSouth Corporation
- International Paper
- Honeywell
- Walt Disney
- First Union Corporation
- Duke Energy
- American Express
- Sprint
- Raytheon Company
- Caterpillar Inc.
- Dow Chemical
- EDS
- Alcoa Davenport Works
- Pfizer Inc.
- Johnson Controls, Inc.
- Eastman Kodak
- Nationwide Insurance
- Abbott Labs.
- Kimberly-Clark
- Weyerhaeuser
- Cisco Systems
- John Deere
- Southern Company
- Union Pacific Railroads
- Whirlpool Corporation
- Monsanto
- Best Buy
- Northrop Grumman
- General Dynamics Information Systems
- The St. Paul Insurance
- Sonoco
- Eaton Corporation
- Solectron Technology
- PPG
- Suntrust Bank
- Cummins, Inc.
- Union Carbide
- B.F. Goodrich
- Dominion (formerly Virginia Power)
- Peco Energy Company
- Norfolk Southern
- The Sherwin-Williams Company
- Applied Materials
- Corning
- Quaker Oats
- Eastman Chemical
- Pitney Bowes
- Black & Decker (US) Inc.
- Medtronics
- Bethlehem Steel
- BB&T
- Cooper Industries
- USG Corp.
- CP&L
- Danaher





# SCIENCE | MATHEMATICS | ENGINEERING | TECHNOLOGY MAJORS & CAREERS

## School of Agriculture and Environmental and Allied Sciences

Dean: **Dr. Alton Thompson**  
**Agricultural and Biosystems Engineering**

Soil & Water Quality Modeling  
Research & Development  
Soil & Water Conservation  
International Foreign Service  
Irrigation & Drainage Engineering  
Water Resources Engineering  
Alternative Energy Systems  
Environmental Engineering

### Agricultural Science - Earth and Environmental Sciences (Earth and Environmental Science, Landscape Horticulture Design, Plant / Soil Science)

State / Local Environmental Planners  
Waste Management  
Environmental Restoration  
Earth & Environmental Planners  
Consultant  
Regulator  
Environmental Protection

### Agricultural Science (Natural Resources)

Soil & Water Management  
Water Resources  
Ecological Restoration  
Soil Scientist  
Forestry Management

### Animal Science (Animal Science, Animal Industry)

Ranch, Farm & Feedlot Management  
Sales & Marketing  
Wildlife Resources Management  
Animal Nutrition  
Husbandry at Zoos  
Genetics & Biotechnology  
Animal Science Technologist  
Swine Breeder  
Quality Control Supervisor  
Poultry Specialist  
Pharmaceutical Representatives  
Animal Care Technician  
Agricultural Research Technicians  
Extension Agent  
Food Sanitarian  
Meat Inspector

## College of Arts & Sciences

Dean: **Dr. Phillip Carey**  
**Applied Mathematics**

Scientist  
Consultant  
Engineer

### Biology

Consultant  
Research

### Biology - Secondary Education

Teacher

### Chemistry

Scientist  
Consultant

### Chemistry Secondary Education

Teacher

### Engineering Physics

Physicist  
Engineering and Materials Science  
Research and Development

### Mathematics

Mathematician  
Statistician  
Actuary  
Researcher  
Engineer  
Biostatistician  
Consultant

### Mathematics - Secondary Education

Teacher

### Physics

Research Physicists  
Astronauts  
Medical Researcher  
Business Entrepreneurs

### Physics - Secondary Education

Teacher

## College of Engineering

Dean: **Dr. Joseph Monroe**  
**Architectural Engineering**

Energy & Building Systems Engineering  
Structural Design/Engineering  
Facilities Planning and Management  
Electrical Systems & Lighting Design  
Architectural Design  
Construction  
Research and Development

### Chemical Engineering

Biochemical Engineering  
Biotechnology  
Pharmaceutical  
Environmental Engineering  
Production & Process Engineering  
Medicine  
Research and Development

### Civil Engineering

Environmental Engineering  
Geotechnical Engineering  
Structural Engineering  
Transportation Engineering  
Water Resources Engineering  
Research and Development

### Computer Science

Application Programming  
Systems Analyst  
Software Engineering  
Systems Programming  
Network Administration  
Database Administration  
Sales Support Engineering  
Research and Development

### Electrical Engineering

Communication Engineer  
Signal Processing Engineer  
Computer Engineer  
Electronic Material & Devices  
Power Systems Design  
Research and Development

### Industrial Engineering

Systems Integration  
Systems Analyst  
Operations Management  
Manufacturing Engineering  
Ergonomics & Human Factors  
Research and Development

### Mechanical Engineering

Energy-Thermal Systems  
Design  
Fluid Systems Engineering  
Manufacturing and Machine Design  
Robotics  
Material Science and Engineering  
Aeronautical & Aerospace Design  
Research and Development

## School of Technology

Dean: **Dr. Elazer Barnette**  
**Construction Management**

Consultant  
Construction Manager  
Project Manager  
Construction Scheduler  
Estimator  
Inspector

### Electronics & Computer Technology

Industrial Electronic  
Programming Analyst  
Computer Network Technologist  
Quality Control Specialist  
Systems Specialist  
Manufacturing Supervisor  
Shift Superintendent  
Technologist  
Engineering Technologist

### Graphic Communication Systems

Data Manipulator  
Graphic Archiver  
Animator  
Cartographer  
Desktop Publisher  
Web Page Designer  
Drafter / Designer  
Graphic Archivist

### Manufacturing Systems

Quality Control Specialist  
Production Supervisor  
Inventory / Materials Management  
Manufacturing Systems Analyst  
Automation and High Technology  
Applications Specialist  
Projection Engineering Specialist  
Industrial Sales  
Customer Relations  
Technical Management

### Occupational Safety and Health

Health Inspector  
Safety Inspector  
Business Consultant

### Technology Education

Teacher  
Industrial Trainer  
Consultant

### Vocational Industrial Education

Teacher  
Industrial Trainer  
Consultant

## North Carolina A&T State University

### University Relations

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[www.ncat.edu](http://www.ncat.edu)



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