A woman with dark hair, wearing a white lab coat, safety glasses, and yellow gloves, is focused on a task in a laboratory. She is holding a glass rod and appears to be working with a piece of equipment. The background shows various laboratory glassware and equipment, including a Bunsen burner and a flask on a stand.

*South Carolina Alliance for Minority Participation
Fifth Annual Science & Engineering
Research Conference*

*Benedict
College*

Claflin College

*Clemson
University*

*College of
Charleston*

*Midlands
Technical
College*

*South Carolina
State University*

*University of
South Carolina*

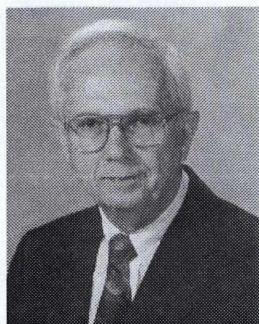
*Voorhees
College*

*Research Conference
Proceedings
July 31, 1999
University of South Carolina
Columbia, South Carolina*

South Carolina Alliance for Minority Participation

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*Proceedings
of the
Fifth Annual
Science and Engineering
Research Conference*

South Carolina



Alliance for Minority Participation

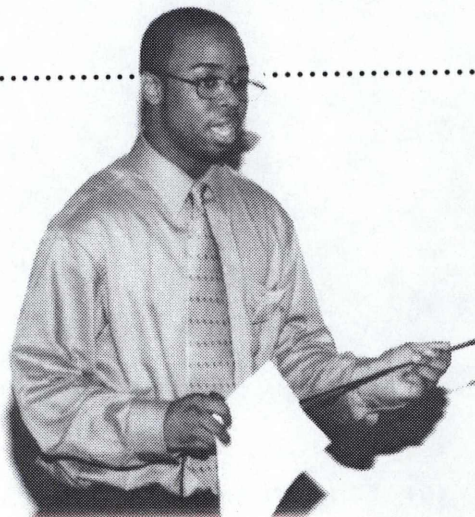
*July 31, 1999
Columbia, South Carolina*

*Supported by the National Science Foundation, the State of South Carolina,
and Partner Institutions.*

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***“Increasing
the chances of
success***

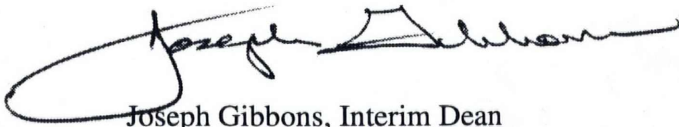


***in the
natural sciences,
engineering, and
mathematics”***

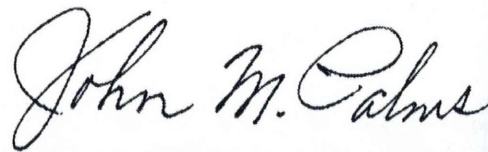
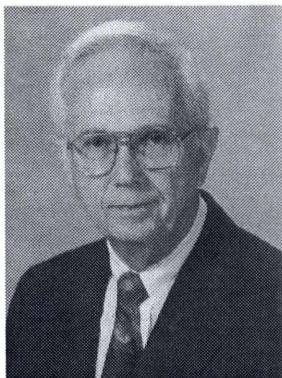
The SCAMP Science & Engineering Research Conference is a major opportunity to showcase the outstanding talents in the National Science Foundation's SCAMP program. We remain proud of our students from South Carolina for their passion for science, engineering, and mathematics (SEM). It is a pleasure to present the proceedings of the 5th Annual Science & Engineering Research Conference, with representation from eight South Carolina alliance institutions. The research conference showcased students engaged in outstanding research in academic, industrial, and government laboratories in the states of South Carolina, North Carolina, and Georgia.

One of 27 national alliances, SCAMP is in the seventh year of a ten-year cooperative agreement with the National Science Foundation. This initiative has contributed to a 60% increase in bachelor's degrees awarded to minorities in SEM. The South Carolina State Legislature, in an unprecedented show of support, appropriated \$3 million for support of SCAMP activities. Minority students in South Carolina are benefiting from mentored research experiences, tutoring, collaborative learning, calculus workshops, computer/learning centers, and graduate school preparation as a result of SCAMP program funding.

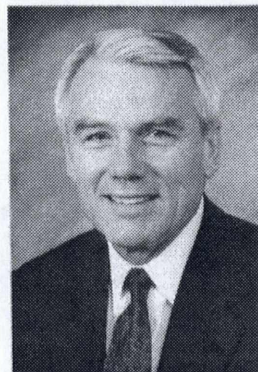
We would like to express our appreciation to the research mentors, judges, sponsors, Dr. A. James Hicks, and the SCAMP Statewide Office for an outstanding research conference as well as our congratulations to the student participants. The communication of research results to the scientific community in the form of presentations is essential to becoming a successful and competitive scientist or engineer. These types of oral presentations strengthen the student's communication and technological skills, thus preparing them for graduate school. We sincerely hope that these proceedings will stimulate more faculty to encourage students to participate in undergraduate research. We challenge all students to continue their pursuit of learning in these fields so that the State of South Carolina can produce a quality workforce and maintain its leadership in science, engineering, and technology.



Joseph Gibbons, Interim Dean
College of Engineering, USC
Project Director

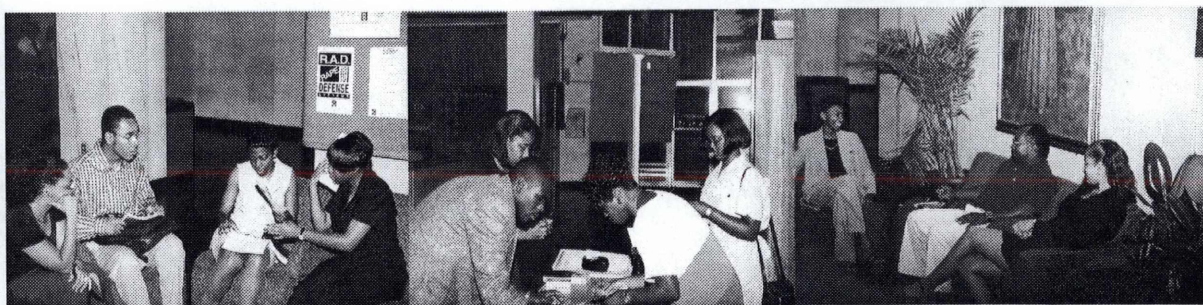


John Palms, President
University of South Carolina
Chairman, Governing Board



**University of South Carolina
Russell House University Union
Columbia, SC**

- 9:00 - 9:20 A.M. Registration, Coffee, Donuts
9:20 - 9:40 A.M. Welcome: *Dr. Joe Gibbons, Interim Dean of Engineering, USC*
Dr. Angela W. Williams, Project Manager, SCAMP
- 9:40 - 9:50 A.M. Presentation Overview: *Mr. Mike Perkins, SCAMP Director-USC*
- 10:00 - 12:15 P.M. Student Presentations
Rooms (203,205,303,305)
- 12:30 - 2:00 P.M. Luncheon Ballroom B
Introduction of Speaker: *Dr. Jerome Odom, Provost-USC*
- *Speaker, Dr. A. James Hicks, National AMP Director*
- Outstanding Research Mentor Awards
- *Dr. Ida Yates, USDA-ARS, Athens, GA*
 - *Dr. H. Trent Spencer, Dept. of Biology, SC Cancer Center, USC*
 - *Dr. R. Bruce Dunlap, Dept. Chairman, Chemistry & Biochemistry, USC*
 - *Dr. John Moore, Dept. of Chemistry & Biochemistry, USC*
- Special Presentations
- *Mr. Greg Rudy, Manager, DOE, Savannah River Operations, Aiken, SC*
 - *Mr. Tom Heenan, Asst. Mgr., DOE, Savannah River Operations, Aiken, SC*
 - *Mr. Tony Edmund, EEO Manager, South Atlantic Region, USDA-ARS, Athens, GA*
 - *Dr. T. Scott Little, Program Manager SC EPSCoR*
- 2:15 - 3:00 P.M. Awards Ceremony, Theater
Closing Remarks: *Dr. S. Sandhu, SCAMP Director- Claflin College*



PRESS RELEASE

1999 Summer Research Conference

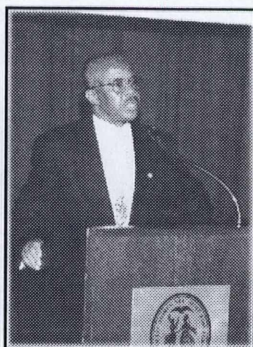
The South Carolina Alliance for Minority Participation (SC-AMP), an alliance of eight institutions of higher education in South Carolina sponsors an annual summer research program for undergraduate students. SCAMP Scholars, students who are majoring in the natural sciences, mathematics, engineering or computer technology work in academic, industrial and government research laboratories for 8 weeks during the summer.

South Carolina EPSCoR/Department of Energy, and Savannah River Operations Office, Department of Energy support the research program facilitated by SC-AMP this summer. Forty SC-AMP Scholars will present their research to a group of judges, mentors, students and parents. The students compete for tuition and book scholarships on July 31, 1999 at the University of South Carolina Russell House, 9a.m. – 3p.m. The keynote speaker, Dr. A. James Hicks is the National Science Foundation's National AMP Director.

Academic institutions participating in SCAMP include: Benedict College, Claflin College, College of Charleston, Clemson University, Midlands Technical College, South Carolina State University, University of South Carolina, and Voorhees College. Each member institution commits their resources toward the implementation of a program that increases the number of underrepresented minorities who receive degrees in science, mathematics, engineering and engineering technology. These areas are so vital to the South Carolina economy that the State of South Carolina supports the program by providing a match for federal dollars from the National Science Foundation.

For more information on SCAMP, please contact the Program Assistant, Ms. Beverly Highland @ 803-777-2464 or highland@enr.sc.edu.

Dr. A James Hicks, Program Director
 National Science Foundation's Alliance for Minority Participation
An excerpt from Dr. Hicks' message to SCAMP



SCAMP, as many of you are aware, is ONE of 27 Louis Stokes Alliances for Minority Participation (LSAMP) Projects nationally.

The projects are spread geographically, as depicted in the chart on the left, from New York to California, and Montana to Texas, Florida and Puerto Rico.

How well are we doing, some might ask?

Nationally, our record is **Very Good!** But very good is not good enough! There remains an important need for many more minority students to engage in the scientific and engineering enterprise in America. The United States Congress has reasoned that workforce diversity is an absolute must if America is to remain preeminent ----to remain at the top of the world's leadership in science, mathematics, engineering and technology (SMET).

NSF has a set of four programs that fit under an umbrella, termed the Diversity Continuum. These programs representing an education continuum from undergraduate to graduate school and progressing through the professorate are: The Historically Black College and University Undergraduate Program (HBCU-UP), and the Louis Stokes Alliances for Minority Participation Program, both at the undergraduate level. Programs at the graduate level

are: the Centers of Research Excellence in Science and Technology (CREST), and the Minority Graduate Education Program (MGE).

South Carolina!----the U. S. Congress and the Nation need YOU to elevate the involvement of underrepresented minorities in the twin fields of science and engineering and the full range of education that underpins success in those disciplines.

You are performing at a very good

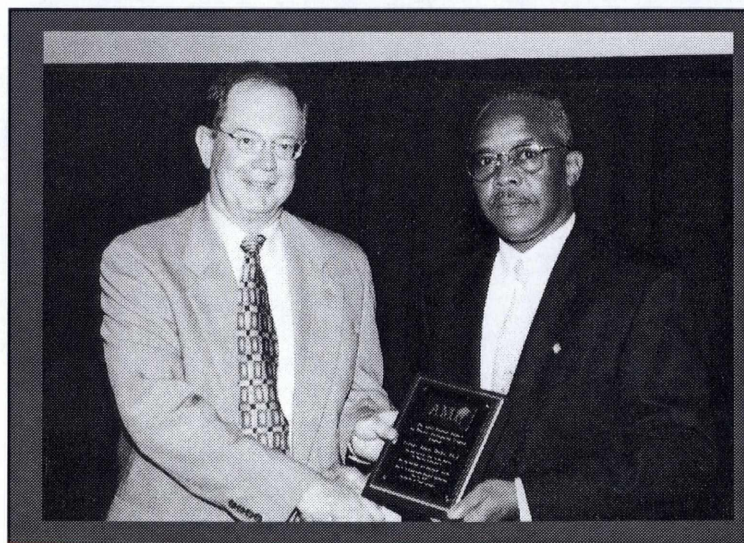
rate, but very good is only very good--it is not good enough for a State with the potential of South Carolina! You are invited to encourage more under-represented minority students to matriculate in SMET disciplines--- and to



make a place for significantly more minority students in SCAMP.

Remember to **THINK BIG---ACT LOCALLY** and become involved, nationally, in the SMET enterprise of America ---and by doing so success will be yours, and South Carolina and America will be the ultimate winners!

A. James Hicks, Ph.D.
 N.S.F./LSAMP Program Director



*Dr. Hicks being presented an award by
 Dr. Jerry Odom, Provost of the University of South Carolina*



After the awards ceremony, Dr. Hicks poses for a snapshot with Dr. Angela Williams, SCAMP Project Manager (center), Ms. Takita Felder, graduate student (right), and Mrs. Saphronia Johnson, graduate student (left).

Speaker Profile Speaker Profile Speaker Profile Speaker Profile

Dr. A. James Hicks has been selected as the new Program Director of the National Science Foundation's Alliances for Minority Participation (AMP) program. Dr. Hicks replaces Dr. William E. McHenry, the program's first director, who was appointed Assistant Commissioner of Education for Academic Affairs by the Board of Trustees of Mississippi State Institutions of Higher Education.

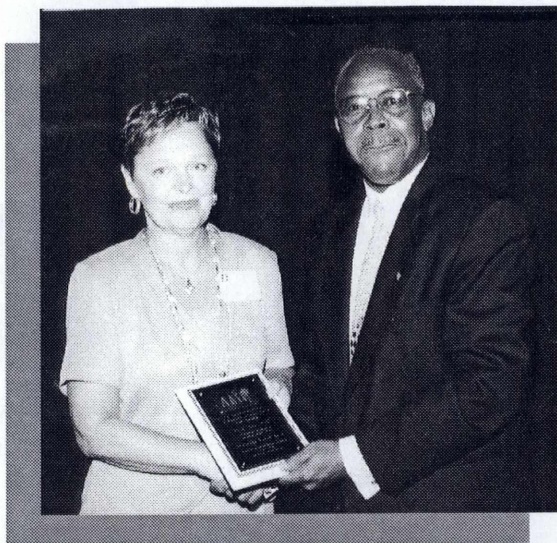
As the former Dean of the College of Arts and Sciences at North Carolina A&T State University, Dr. Hicks is well known on the national scene for his work with the Council of Colleges of Arts and Sciences (CCAS) and the North Carolina Plant Conservation Board (NCPCB). He is a frequent speaker at CCAS training seminars for new deans, and a long standing member of the NCPC board of advisors. Hicks, a plant scientist, received his B.S. degree in Biology from Tougaloo College. He earned his Ph.D. at University of Illinois-Urbana with a postdoctoral work at the Missouri Botanical Gardens, St.

Louis. His administrative training includes participation in the Institute for Educational Management at Harvard University, the Extramural Associates Program at the National Institutes of Health in Bethesda, MD, the Lilly Foundation's Liberal Arts Program for College Administrators in Colorado Springs, CO, and the Christian A. Johnson Foundation's Leadership Program in New York City. He has received numerous awards and recognitions for his work with minority students and faculty in North Carolina. Undoubtedly, one of his most notable awards was the 1998 White House Initiatives Faculty Award for Excellence in Science and Technology. Additionally, he was a member of North Carolina's 12-member delegation to Baden-Wurtemberg, Germany in November 1995. That official visit led to a signed Memorandum of Understanding, which now allow both student and faculty exchanges between the two states.

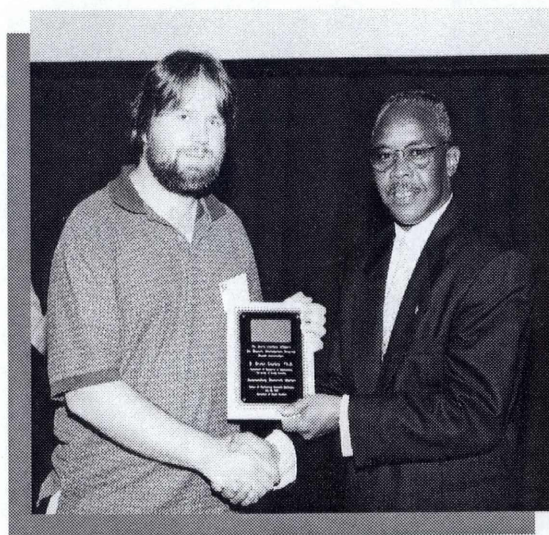
Dr. Hicks has administrative experience, spanning twenty years, at

the levels of department chairperson and college dean. Under his leadership at North Carolina A&T State University, major facilities renovations were completed in the Physics, Chemistry, and Fine Arts buildings while plans were approved by the State Budget Committee for a 134 million dollar General Classroom Building. During his tenure, the University also upgraded its research capabilities by acquiring a state of the art Nuclear Magnetic Resonance (NMR) machine, two electron microscopes -TEM and SEM and several other major pieces of equipment. His experiences in proposal reviews and evaluations in research and a prior Intergovernmental Personnel Act (IPA) assignment at NSF are expected to pay important dividends in his new role as AMP Program Director.

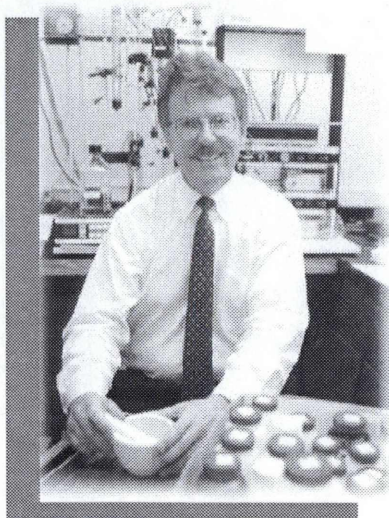
Outstanding Faculty Mentors



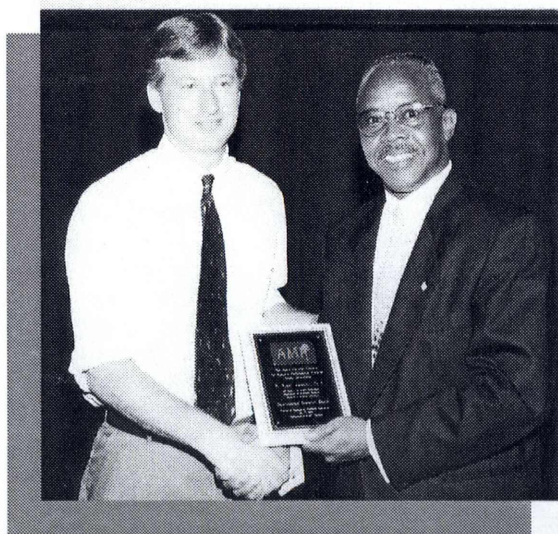
*Dr. Ida Yates works in the Agriculture Research Service Department for the United States Department of Agriculture (USDA). Dr. Yates received her Bachelors of Science in Biology from Wake Forest University in 1963, after which she acquired six credit hours in science education at St. Petersburg Junior College in 1965 and another fifteen credit hours in biology from Appalachian State University in the years 1965-65. In 1968, she received her Masters of Science in Botany from the University of Georgia and achieved her Doctorate of Philosophy in Botany from University of Georgia in 1974. Dr. Yates work experience ranges from being a Biological Technician to being a Research Microbiologist to being a Plant Physiologist. She is currently working on finding a solution to food safety issues that have developed about corn products contaminated by toxins produced by *Fusarium moniliforme*, a fungus. She was nominated for this award by her summer intern Dominick Kennerson from South Carolina State University.*



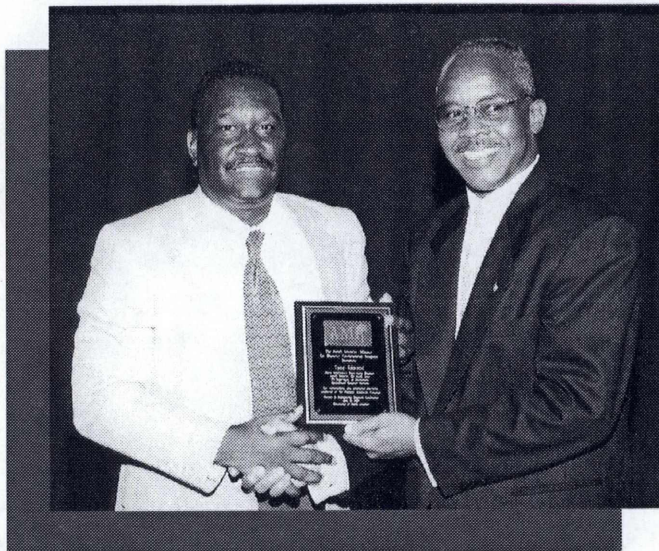
*Dr. John G. Moore is a recent graduate of the University of South Carolina's Department of Chemistry and Biochemistry Doctoral Program. He received his Bachelors of Science in Food Science, with a Minor in Chemistry, from the University of Delaware in 1989. While seeking his Ph.D., Dr. Moore co-authored two publications: 1) *Retroviral co-Expression of Thymidylate Synthase and Dihydrofolate Reductase Confers Fluoropyrimidine and Antifolate Resistance*, and 2) *NMR Spectroscopic Study of Selenosubtilisin BPN' as a Comparison to Selenosubtilisin Carlsberg*. Dr. Moore's work experience ranges from being a Food Technologist for Yofarm Corporation to being a Factory Supervisor for Baskin-Robbins Ice Cream Company. He is currently a Candidate for a Juris Doctorate from the University of South Carolina School of Law. He was nominated for this award by his summer intern Amario Bennett from the University of South Carolina.*



Dr. R. Bruce Dunlap is a professor at the University of South Carolina in the Department of Chemistry and Biochemistry. He received his Bachelors of Science from Beloit College in 1964, and he received his Doctorate of Philosophy from Indiana University in 1968. After achieving his Ph.D., he worked as a post-doctoral in the Division of Biochemistry for the Scripps Clinic and Research Foundation in 1968-70. Dr. Dunlap has been the recipient of numerous State, Local, and University awards including the School of Medicine Basic Science Research Award, in 1992, and the Governor's Award for Excellence in Science Awareness, in 1994. Dr. Dunlap is the author of numerous publications in the field of Chemistry and Biochemistry. His laboratory is currently involved in several major research areas: the Mechanism of action of selected Folate Enzymes, and the Exploitation of the Properties of Selenium and Tellurium to Facilitate the X-ray Crystallographic and Nuclear Magnetic Resonance Studies of Protein Structure and Function. He was nominated for this award by his summer intern Amario Bennett from the University of South Carolina.



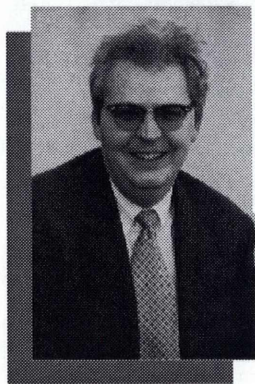
Dr. Trent Spencer is a assistant professor at the University of South Carolina in the Department of Biological Sciences. He has a joint appointment between University of South Carolina, Department of Biological Sciences and the South Carolina Cancer Center. He received his Bachelors of Science from Indiana University, and he received his Doctorate of Philosophy from Creighton University School of Medicine in 1991. After receiving his Ph.D., he worked as a postdoctoral at the St. Jude Children's Research Hospital. Dr. Spencer's research interests are in the development of gene and immunotherapy treatments for cancer. Currently, he is investigating gene transfer methods that may be useful for protecting patients from the harmful side effects of chemotherapy. In addition, he and his research team is attempting to combine gene and immunotherapy techniques for the treatment of cervical cancer and acute lymphoblastic leukemia. He was nominated for this award by his summer intern Sharmina Miller from Voorhees College.



Mr. Tony Edmund, EEO Manager for the South Atlantic and Mid-South Area Agricultural Research Services, provided research placements and housing for many SCAMP Summer Interns. Mr. Edmund provided the students with guidance, instruction and mentoring. He was their “Father” away from home.

U. S. Department of Agriculture

The mission of the U. S. Department of Agriculture is to enhance the quality of life for the American people by supporting production agriculture; ensuring a safe, afford-able, nutritious, and accessible food supply; caring for agricultural, forest, and range lands; supporting sound development of rural communities; providing economic opportunities for farm and rural residents; expanding global markets for agricultural and forest products and services; and working to reduce hunger in America and throughout the world.



Dr. Scott Little, EPSCoR Program Manager, provided funding for many SCAMP Academic Year and Summer Research Interns. EPSCoR also supported the Science & Engineering Research Conference by providing the plaques and acrylic awards for the students. SCAMP would also like to acknowledge Dr. Mike Matthews, EPSCoR-DOE, Dept. Chemical Engr., USC.

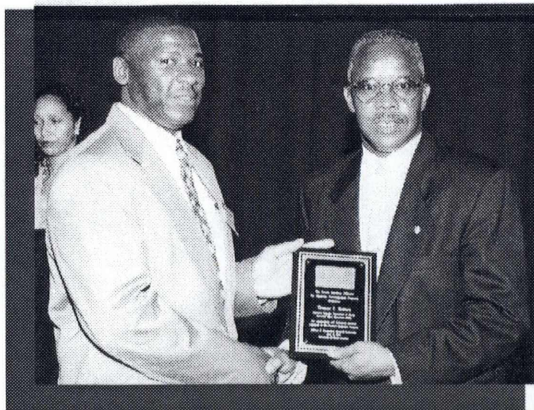
South Carolina EPSCoR Program

The goal of the South Carolina EPSCoR Program is to improve South Carolina's R&D competitiveness through the development and utilization of science and technology resources in its major research universities and to promote productive, long term partnerships between academia, government, and the private R&D sector.



Accepting on behalf of Mr. Greg Rudy, Manager Savannah River Operations Office, is Dr. Judy Bostock.

Westinghouse Savannah River Site (WSRS) and the Department of Energy (DOE), Savannah River Operations Office, have supported SCAMP by providing research placements and scholarships. The sponsorship from DOE, Savannah River Operations Office, provided tuition scholarships for the winners of the Science & Engineering Research Conference. SCAMP would also like to thank the following people from WSRS and DOE: Cynthia Anderson, Tania Smith and Michelle Nix.



Accepting on behalf of Mr. Thomas Heenan, Asst. Manager Environmental Programs, DOE, is Mr. Thomas Johnson.

Westinghouse Savannah River Site

SRS operates under a philosophy outlined in the site's four imperatives. These imperatives are: working safely; conducting all jobs within a framework of formal disciplined operations; finding cost-effective ways to do all work; and examining all parts of every job to find ways to continuously improve. While the changing world has caused an evolution of the site's original defense mission, the future of SRS lies in three areas: reducing the nuclear danger; transferring applied environmental technology to government and non-government entities; and forming economic and industrial alliances.

“Outstanding Summer Researcher”

** This award was based on research mentors recommendations*

Ethell Vereen, Jr.

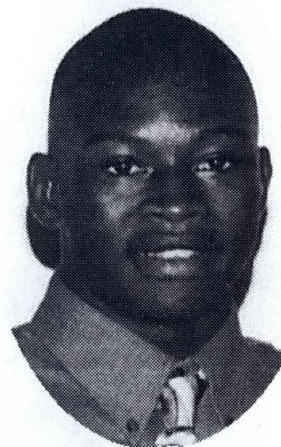
Discipline: Biological Sciences

Institution: South Carolina State University

Research Institution: USDA Agricultural Research Service

Russell Agricultural Research Center

Research Mentor: Dr. Danny Akin



Plant factors that influence enzyme retting of flax for linen

The development of a process to enzyme-ret flax (*Linum usitatissimum*) has proven to be quite effective, but the question remains to this process' stability and effectiveness in retting an entire plant. Samples of flax stems from the cultivar 'Ariane' grown in South Carolina in 1999 at two stages of maturity (optimal for fiber and optimal for seed) were separated into different regions of the plant and analyzed by histochemistry and light microscopy to determine the structure and composition of the plant at different locations. The Fried's test was used to analyze the "enzyme-retting" of the flax. Stem sections were incubated with enzymes in a rotary incubator (20 revolutions per minute at $40 \pm 2^\circ \text{C}$ for 24th) and the fiber were then rated as to how well they separated from the residual core. The fibers were then dried and the percentage of fiber in each region was calculated to provide further data as to the fiber yield of different regions. In particular, the amount of fiber in the stubble, which is lost in harvesting, was determined. Sites and types of lignin, which is detrimental of retting, were identified using histochemistry. Results show variations in yield, structure, and chemistry of the fiber along the entire length of the flax stem and identify specific phenomena related to improved "enzyme-retting" for linen fiber.

“Outstanding Summer Researcher”

** This award was based on research mentors recommendations*

Alisha Sparks

Discipline: Biological Sciences

Institution: Voorhees College

Research Institution: USDA Agricultural Research Service

Russell Agricultural Research Center

Research Mentor: Dr. Kurt Lawrence



Analyzing Complex Impedance Data for Sensing Moisture in Cereal Grains

The complex impedance data that I analyzed was collected in 1997 and 1998 in Kansas City, Kansas for the purpose of characterizing a parallel-plate moisture sensor, which was developed at the Russell Research Center, and has potential as an online moisture sensor. Scientists used the shielded parallel-plate moisture sensor to measure the moisture content in several different cereal grains, which included wheat, corn, rice, barley, and soybeans. The format, which the instrument uses to record data, was incompatible with the needed for further processing. Therefore, I converted and combined data through a series of complex number mathematical manipulations and spreadsheet macros into a beneficial format for further analysis. Next, I calculated the predicted moisture content values from the raw data. I also calculated the residual values and interpretive statistics for data analysis. Finally, I produced publication quality graphs and figures that allowed the scientist to evaluate the accuracy of the moisture sensor.

“First Place” Physical & Life Sciences

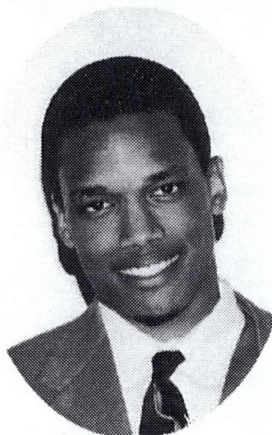
David Williams

Discipline: Biological Sciences

Institution: South Carolina State University

Research Institution: North Carolina State University

Research Mentor: Dr. Greg Fenner



The Effects of Increase Nitrogen Treatment on Isoflavonoids

Isoflavonoids are a sub-class of a group of compounds called flavonoids. Soybean seeds contain two principal isoflavonoids, daidzein and genistein. It has been recently understood that a diet rich in legumes such as soybean, decrease the risk of cancer. Nitrogen, an important element in plant growth and is used for the synthesis of amino acids such as phenylalanine which is a precursor to proteins and isoflavonoids. Thus, a study was conducted to determine if high nitrogen treatments has any effect on soybean; isoflavonoid concentration.



SCSU Research Participants present Mr. Tony Edmund a SCSU clock for his great support.

“Second Place” Physical & Life Sciences

Laura Stewart

Discipline: Biological Sciences

Institution: South Carolina State University

Research Institution: North Carolina State University

Research Mentor: Vickie Brewster



Morphological Differences of Cercospora Species on Maize

Eleven isolates of *Cercospora* were obtained from diseased corn leaves that were collected from several geographical regions throughout the United States. Previous molecular genetic studies have shown that these isolates can be placed into three groups, *Cercospora zea-maydis* type 1, *C. zea-maydis* type 2, and *C. sorghi* var. *maydis*. Thus, the purpose of this study was to determine whether there are distinct morphological differences between the two sibling species of *C. zea-maydis* and *C. sorghi* var. *maydis*. Lesions of infected leaf tissue were placed in a moist chamber where sporulation was induced and conidia and conidiophores were examined with a microscope. Also, cultures of these isolates were grown on V8 agar in an attempt to produce spermatia. Then, it may be possible to determine whether these isolates can reproduce sexually.

“First Place” Engineering

Dylan Bess
Discipline: Engineering
Institution: University of South Carolina
Research Institution: University of South Carolina
Research Mentor: Dr. Roger Dougal



Use of Simulations in System Engineering

Our objective is to study the performance of a system containing a magnetically tripped circuit breaker by creating a model of the circuit breaker using the Advanced Continuous Simulation Language (ACSL). After I take several measurements of dimensions, forces, and other data, a graduate student will use it to complete an ACSL model of the circuit breaker. My goal is to determine whether adverse interaction will occur between the limiting circuit breaker and a polymer current limiter when a system fault occurs. I will include the model of the circuit breaker into a simulation of the entire electric system. I will then present the result from examining for circumstances in which the circuit breaker may fail to open, which would lead to damage the power system.

“Second Place” Engineering

Myra Suarez
Discipline: Engineering
Institution: Midlands Technical College
Research Institution: University of South Carolina
Research Mentor: Dr. Perla Balbuena



Molecular Dynamics Simulations of the Ionophore Valinomycin and its Potassium Complex

Ionophores are substances that increase the permeability of membranes to particular ions and passively permit ions to diffuse across a membrane in either direction. Valinomycin is a naturally occurring ionophore that has an ion specificity for the potassium ion. Molecular dynamics simulations are used to study the ionophore valinomycin and its potassium complex. Valinomycin wraps around the potassium ion into the shape of a "tennis ball seam". A hydrophobic exterior enables the complex to pass through the interior of a membrane. Valinomycin diffuses through the membrane and releases the ion onto the other side of the membrane. For complete transport, the uncomplexed valinomycin must return to the original side of the membrane ready to repeat the process.

“First Place” Mathematics & Computer Science

Tracy Ferguson

Discipline: Computer Science

Institution: Claflin College

Research Institution: USDA Agricultural Research Service
Russell Agricultural Research Center

Research Mentor: Don Quinn and Barbara Godfrey



Adding to the information Highway

Along with my partner Serphia Curry, I structured and assisted in the graphical enhancement and development of web pages for USDA-South Atlantic Area departments at the Russell Research Center (RRC). The objective of the assignment was to develop web pages for the Area Administrative department. A specific number of web pages were not stipulated at the beginning of the internship because the development of web pages was a new experience for my partner and myself. The actual number of web pages was a direct result of interviews with the department employees or staff. We were given freedom to develop the pages in any format as long as they fit into the existing USDA web site and met the governmental standards. Serphia Curry and I were able to design pages for the Procurement/Property and Safety, Health and Environmental Protection area. The methods that were used were research of other web pages and RRC departments, information gathering, structure and design experiments, and development of actual web pages.

A internship of this magnitude helps those students majoring in computer science or management information systems grasp the environmental atmosphere that they will be working in.

“Second Place” Mathematics & Computer Science

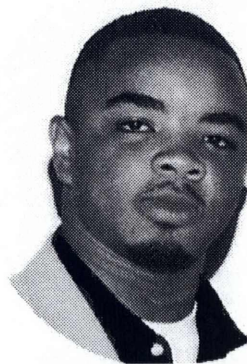
Fredrick Williams

Discipline: Mathematics & Computer Science

Institution: South Carolina State University

Research Institution: USDA Agricultural Research Service
Russell Agricultural Research Center

Research Mentor: Dr. David Himmelesbach



Analysis of Complex Proton NMR Spectra

The detailed analysis of the 500 MHz proton nuclear resonance (NMR) spectrum of an isolated component from "Coastal" bermudagrass cell walls was conducted. Two-dimensional NMR techniques have proven this component to be the phenolic ester of a pentose polysaccharide (known as FAXdo2(4)-a). The first-order chemical shifts and scalar coupling constants measured from the actual proton spectrum did not produce a matching synthetic spectrum. This indicated that the interactions were not first-order and thus could not be directly measured. Thus, in order to report accurate data and establish the conformation of this molecule, more accurate data was required. The computer program WIN-Daisy was employed to iterate between the actual and synthetic spectrum in order to provide data of sufficient accuracy. Accuracy was determined by minimizing the root mean square(RMS) error between the two spectra. The results of this work will provide the precise structure of a compound that is key to understanding the complex nature of plant cell walls. In addition, it will provide essential information for the selection of enzymes capable of available as a metabolizable energy resource for improvement of animal nutrition.

Research Participants

Jamie Epps
 Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: USDA, ARS
 Research Mentor: Dr. Judy Thies
 Title: "Development of *Meloidogyne incognita* in resistant and susceptible pepper genotypes"



Julla Cann
 Discipline: Physics
 Institution: Benedict College
 Research Institution: Westinghouse Savannah River Site
 Research Mentor: Dr. Mark R. Duignan
 Title: "Cross-flow Filtration of Hazardous Waste"



Leonard Pressley, Jr.
 Discipline: Biological Sciences
 Institution: Claflin College
 Research Institution: Claflin College
 Research Mentor: Dr. Walter Flomer
 Title: "Synthesis and characterization of poly (pyrazolyl) methane complexes of borohydrides"



Veronica Torres
 Discipline: Biological Sciences
 Institution: Clemson University
 Research Institution: Clemson University
 Research Mentor: Dr. A. Wheeler
 Title: "The environmental fate of thermal polyaspartate (TPA)"



Demetrius M. Jones
 Discipline: Management Info. Systems
 Institution: University of South Carolina
 Research Institution: University of South Carolina
 Research Mentor: Dr. Sandip Dutta
 Title: "The development of a web page for the applied computational fluids research laboratory"



Andedra Edwards
 Discipline: Computer Science
 Institution: Benedict College
 Research Institution: University of South Carolina
 Research Mentor: Dr. Caroline Eastman
 Title: "Data Resource"



Theodore Jenkins
 Discipline: Mathematics
 Institution: Midlands Technical College
 Research Institution: Midlands Technical College
 Research Mentor: Jay Abramson
 Title: "An Internet trigonometry class for students at Midlands Technical College"

Sam Lacount
 Discipline: Computer Science
 Institution: South Carolina State University
 Research Institution: South Carolina State University
 Research Mentor: Dr. Donald Walters
 Title: "Windows 2000"

Ebony R. Middleton
 Discipline: Physics
 Institution: College of Charleston
 Research Institution: College of Charleston
 Research Mentor: Dr. Linda R. Jones
 Title:

Denita Williams
 Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: Westinghouse Savannah River Site
 Research Mentor: Marilyn Frank
 Title: "What is the optimal environment best suited for the petroleum degrading bacteria from Poland"

Rochelle Maple
 Discipline: Biological Sciences
 Institution: Voorhees College
 Research Institution: Westinghouse Savannah River Site
 Research Mentor: Toney Dunbar
 Title: "F and H area treatment remediation system"

Fredrick Willis
 Discipline: Computer Science
 Institution: South Carolina State University
 Research Institution: USDA-ARS
 Research Mentor: Dr. David Himmelsbach
 Title: "Analysis of complex proton NMR spectra"



Research Participants

Ethell Vereen, Jr.

Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: USDA-ARS
 Research Mentor: Dr. Danny E. Akin
 Title: "Plant factors that influence enzyme retting of flax for linen"



Myra Suarez

Discipline: Engineering
 Institution: Midlands Technical College
 Research Institution: University of South Carolina
 Research Mentor: Dr. Perla Balbuena
 Title: "Molecular dynamics simulations of the ionophore valinomycin and its potassium"



Chikynda A. Moore

Discipline: Engineering
 Institution: University of South Carolina
 Research Institution: University of South Carolina
 Research Mentor: Dr. Sandip Dutta
 Title: "Heat transfer coefficient enhancement with perforated baffles"



Dominick Kennerson

Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: USDA-ARS
 Research Mentor: Dr. Ida E. Yates
 Title: "Effect of EFC799 on seed rot in corn"



David Williams

Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: North Carolina State University
 Research Mentor: Dr. Greg Fenner
 Title: "The effects of increase nitrogen treatment on isoflavonoids"



Laura Stewart

Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: North Carolina State University
 Research Mentor: Dr. Vicki Brewster
 Title: "Morphological differences of *Cercospora* species on maize"



Willette Crawford

Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: Westinghouse Savannah River Site
 Research Mentor: Fatina Washburn
 Title: "The permeable reactive barrier/geosiphon treatment system for metals contaminated groundwater project"

Serphia Curry

Discipline: Management Information Sys.
 Institution: Claflin College
 Research Institution: USDA-ARS
 Research Mentor: Don Quinn and Barabara Godfrey
 Title: "Enhancement of the Agricultural Research Services Site"

Amario Bennett

Discipline: Biological Sciences
 Institution: University of South Carolina
 Research Institution: University of South Carolina
 Research Mentor: Dr. R. Bruce Dunlap & Dr. John G. Moore
 Title: "Purification and steady state characterization of wild-type and methionine-20 sulfoxide *E. coli* Dihydrofolate reductase"

Delphine Felder

Discipline: Biological Sciences
 Institution: Voorhees College
 Research Institution: Westinghouse Savannah River Site
 Research Mentor: Robert Johnson
 Title: "The RCRA/CERCLA process as viewed from a time and cost perspective"

Takeshia Campbell

Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: USDA-ARS
 Research Mentor: Dr. Jeff Buhr
 Title: "Persistence of *salmonella* on broiler skin during the early steps of processing"

Sharmina Miller

Discipline: Biological Sciences
 Institution: Voorhees College
 Research Institution: USC and SC Cancer Center
 Research Mentor: Dr. H. Trent Spencer
 Title: "Determining variants of thymidylate synthase that are suitable for use in gene therapy applications"



Research Participants

Miguel Rodriguez
 Discipline: Engineering
 Institution: University of South Carolina
 Research Institution: University of South Carolina
 Research Mentor: Dr. Stephen McNeill
 Title: "3-Dimensional measurements of material response of thin-centered crack panels"



Azade Kitchings
 Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: USDA-ARS
 Research Mentor: Alvin M. Simmons
 Title: "Whitefly and parasitoid attractance to color"



Stephanie Sampson
 Discipline: Computer Science
 Institution: Benedict College
 Research Institution: Benedict College
 Research Mentor: Dr. Larry L. Lowe
 Title: "The use of regression analysis (modeling) for simulated microgravity studies"



Latasha Thompson
 Discipline: Chemistry
 Institution: University of South Carolina
 Research Institution: Westinghouse Savannah River Site
 Research Mentor: Bob Henderson
 Title: "Determination of iodine-129 activity in air filters"



Katrina Scott
 Discipline: Biological Sciences
 Institution: University of South Carolina
 Research Institution: University of South Carolina
 Research Mentor: Dr. Berten Ely
 Title: "The inside is what counts"



Alisha Sparks
 Discipline: Mathematics
 Institution: Voorhees College
 Research Institution: USDA-ARS
 Research Mentor: Dr. Kurt Lawrence
 Title: "Analyzing complex impedance data for sensing moisture in cereal grains"



Natalia Johnson
 Discipline: Biological Sciences
 Institution: Claflin College
 Research Institution: USC - Medical School
 Research Mentor: Dr. Clarke F. Millette
 Title: "Staging of L-selectin expression in the adult rat testis"



Naria Lofties
 Discipline: Biological Sciences
 Institution: South Carolina State University
 Research Institution: USDA-ARS
 Research Mentor: Dr. Arthur Hinton Jr.
 Title: "The effect of oleic acid on bacteria isolated from the skin of broiler chicken"

Amiel Fernandez
 Discipline: Engineering
 Institution: University of South Carolina
 Research Institution: University of South Carolina
 Research Mentor: Dr. T.S. Sudarshan
 Title: "Engineering design lessons in the development of a prototype silicon carbide etcher"

Tracy Ferguson
 Discipline: Computer Science
 Institution: Claflin College
 Research Institution: USDA-ARS
 Research Mentor: Don Quinn and Barabara Godfrey
 Title: "Adding to the information highway"

Seneca McDaniel
 Discipline: Engineering
 Institution: University of South Carolina
 Research Institution: University of South Carolina
 Research Mentor: Dr. Jim Ritter
 Title: "Experimental studies of carbon aerogels for the storage of natural gas in automobiles"

Dylan Bess
 Discipline: Engineering
 Institution: University of South Carolina
 Research Institution: University of South Carolina
 Research Mentor: Dr. Roger Dougal
 Title: "Use of simulations in system engineering"

Romelle Horton
 Discipline: Computer Science
 Institution: Voorhees College
 Research Institution: University of South Carolina
 Research Mentor: Dr. S. Dutta

Russell McElveen
 Discipline: Biology
 Institution: Clemson University
 Research Institution: Clemson University



1999 SCAMP SUMMER Research Conference
Judging Criteria

GENERAL GUIDELINES:

Creativity – (25) Points

- 1) Does the project show creative ability and originality in area such as

- the question asked
- the approach to solving the problem
- analysis of the data
- interpretation of the data
- the use of equipment
- the construction or design of new equipment

****Consider how much help a student received. Any credit for creative ability should reflect the student's own contributions. This should become clear through questioning during the presentation.**

****What is creative research? It is research that supports an investigation and helps answer a question in an original way. Creative research promotes an efficient and reliable way to solve a problem.*******

Scientific Thought or Engineering Goals -- (25) Points

Scientific Thought:

- 1) Is the problem stated clearly and unambiguously?
- 1) Was the problem sufficiently limited to allow plausible attack?
- 1) Are variables clearly recognized and defined? Were they controlled for?
- 1) If control(s) groups were necessary, did the student recognize their need and were they correctly used?
- 1) Are there adequate data to support the conclusions?
- 1) Does the student recognize the data's limitations?
- 1) Does the student recognize and understand how the project ties to related research and the relevancy of the project to their field of study?
- 1) Does the student have an idea of what further research is warranted?

Engineering Goals:

- 1) Does the project have a clear objective?
- 1) Is the objective relevant to potential user's needs(s)?
- 1) Is the solution:
 - workable and practical?
 - acceptable to the potential user? Or is it a solution likely to be rejected or ignored?

- 1) Could the solution be utilized successfully in design or construction of some end product?
- 1) Is the solution a significant improvement over previous alternatives?
- 1) Has the solution been tested for performance under conditions of use?

Thoroughness – (25) Points

- 1) Was the purpose carried out to completion within the scope of the original intent?
- 1) How completely was the problem covered?
- 1) Are the conclusions based on a single experiment or replication?
- 1) Is the student aware of other approaches or theories?
- 1) Is the student familiar with the literature in the field of study?

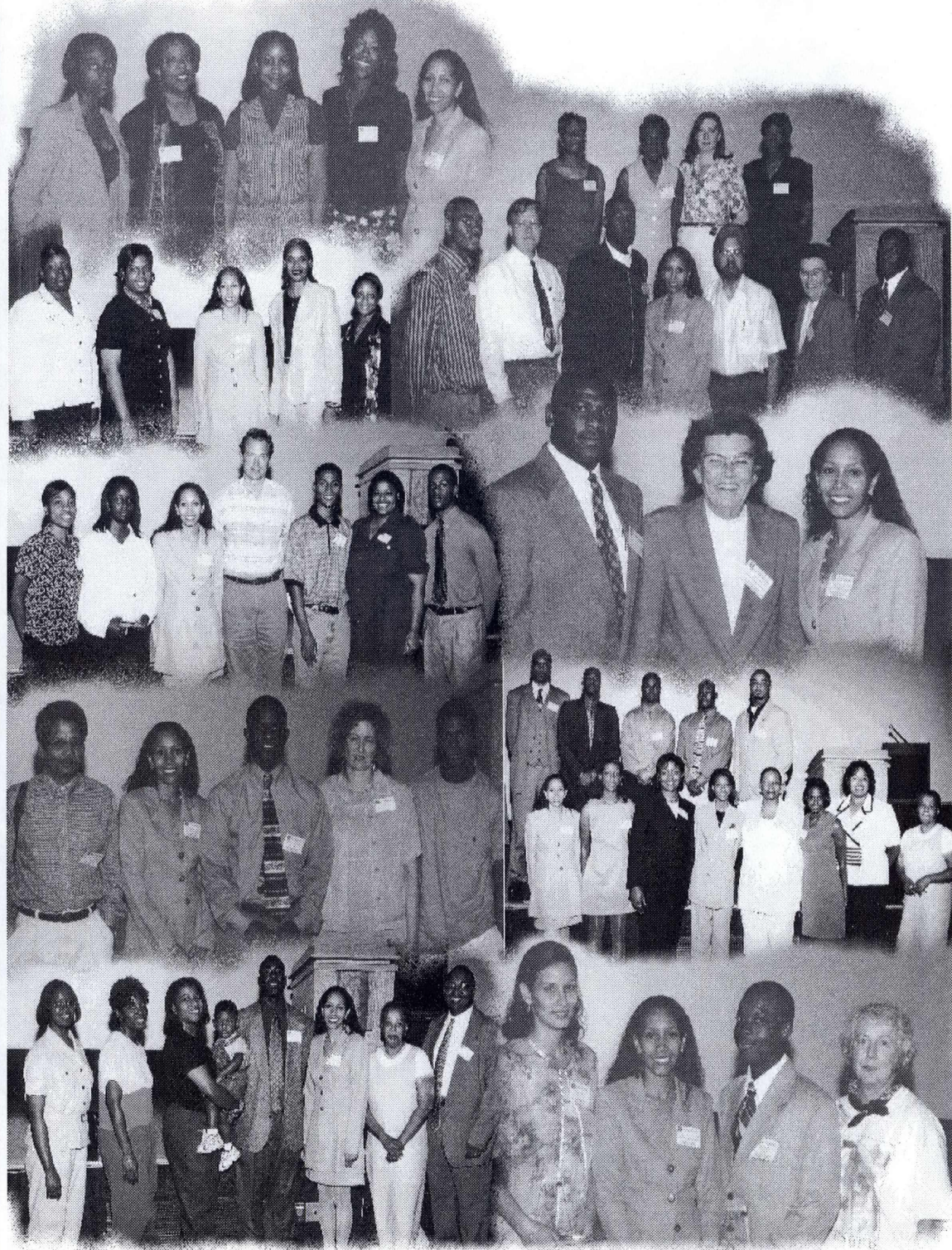
Oral Presentations – (25) Points

- 1) How clearly did the student discuss the project and explain the project's purpose, procedures, and conclusions? Be prepared for nervousness, but watch out for memorized speeches that reflect little understanding of underlying principles.
 - 1) Are the important phases of the project presented in an orderly manner?
 - 1) Are the data/results presented clearly?
 - 1) Use of overheads or slides? Are they clear, and concise? Do they adequately support oral presentation?
 - 1) Was the oral presentation given within the 8 minute time period?
- 1) How well did the student handle questions by the audience?

Judging Criteria



Group Shots



*Congratulations
1999 Summer Research
Participants
for a
job well done!*

*Best Wishes on your
upcoming semester!*

*South Carolina Alliance for Minority Participation
Columbia, SC*

Acknowledgements

The following individuals helped to make this research conference a great success.

Dr. Joseph Gibbons,
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Project Manager
Ms. Beverly Highland,
Project Assistant
Dr. John Grego, Project
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Dr. Shingara Sandhu, Claflin
College
Dr. Robert Snelsire, Clemson
University
Dr. Dinesh Sarvate, College of
Charleston
Dr. Ronald Drayton, Midlands
Technical College
Dr. Judith Salley, South Carolina
State University
Dr. Cassandra Smith, Voorhees
College
Mr. Mike Perkins, USC

Ms. Concetta Crawford, Benedict
College
Ms. Lisa Smith, South Carolina
State University
Mr. Dwayne White, USC

Mr. Ken Miller, USC
Dr. Adrienne Cooper, USC
Dr. Rebecca B. Duillard, Claflin
College
Dr. Joe Emily, USC
Dr. Michael Howell, USC
Dr. Arthur Hinton, Jr., USDA-ARS
Dr. Pernell Lewis, USC
Ms. Lucy Martin, Voorhees College
Dr. Anthony Martin, Clemson
University
Dr. Neyoka Fisher, Benedict College
Dr. Robert Oakman, III, USC

Mrs. Saphronia Johnson, USC
Ms. Takita Felder, USC
Mr. Quincy Ford, USC
Ms. Terri Wright, USC
Mr. Michael Boone, USC
Ms. Sirena Hargrove, USC

*We extend thanks to all
the parents in attendance
and
the SCAMP 1999
Summer Bridge
Participants!*

Dr. A. James Hicks, National AMP
Director
Dr. Jerry Odom, Provost-USC
Mr. Greg Rudy, Savannah River
Operations
Mr. Tom Heenan, Savannah River
Operations
Mr. Tony Edmund, South Atlantic
Region, USDA-ARS
Dr. T. Scott Little, SC EPSCoR
Ms. Michelle Nix, WSRS
Ms. Cynthia Anderson, WSRS
Ms. Tania Smith, WSRS
Ms. Dawn Ward, USC
Mr. Jim Little, USC
Dr. Mike Matthews, USC

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Dr. A. Wheeler, Clemson University
Dr. Sandip Dutta, USC
Ms. Fatina Washburn, Westinghouse
Savannah River Site
Dr. Carolina Eastman, USC
Mr. Jay Abramson, Midlands
Technical College
Dr. Donald Watlers
Dr. Linda R. Jones, College of
Charleston
Ms. Marilyn Frank, Westinghouse
Savannah River Site
Toney Dunbar, Westinghouse
Savannah River Site
Don Quinn, USDA-ARS
Barbara Godfrey, USDA-ARS
Dr. R. Bruce Dunlap, USC
Dr. John G. Moore, USC
Mr. Robert Johnson, Westinghouse
Savannah River Site
Dr. R. Jeff Buhr, USDA-ARS
Dr. H. Trent Spencer, USC
Dr. Roger Dougal, USC
Dr. Stephen McNeil, USC
Mr. Alvin M. Simmons, USDA-ARS
Dr. Larry Lowe, Benedict College
Mr. Bob Henderson, Westinghouse
Savannah River Site
Dr. Berten Ely, USC
Dr. Kurt Lawrence, USDA-ARS
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School

Dr. Arthur Hinton, Jr., USDA-ARS
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Dr. Jim Ritter, USC
Dr. David Himmelsbach, USDA-ARS
Dr. Danny E. Akin, USDA-ARS
Dr. Perla Balbuena, USC
Dr. Ida Yates, USDA-ARS
Dr. Greg Fenner, NCSU
Dr. Vicki Brewster, NCSU

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Dwayne J. White, Editor/Production Manager
Photos by Bennie Brown Photography*

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