










Annual Report
2009 - 2010

COLLEGE OF SCIENCE AND TECHNOLOGY

http://www.cost.tsu.edu/ COLLEGE OF SCIENCE AND TECHNOLOGY, 3100 CLEBURNE STREET, HOUSTON, TEXAS 77004 Tel 713 313 7009

Our Mission

The College of Science and Technology at Texas Southern University prepares students to be proficient in science, technology, engineering and mathematics, to pursue careers in business, education, research, government, and industry. The mission of the College in teaching, research, and service is:

1. To educate a diverse population in science, technology, engineering and mathematics for different professions.
2. To conduct research and engage in scholarly pursuit for the advancement of knowledge.
3. To serve society and the community consistent with the mission of the University.

The instructional mission of the College of Science and Technology is:

1. To provide students of varied scholastic levels access to higher education, by providing the academic foundations necessary for accessing educational programs at the University.
2. To prepare competent professionals and leaders capable of providing effective service and developing solutions to the problems of the nation and the world, especially in urban environs.

In pursuing its missions, the College embraces the following goals:

1. To maintain a quality research infrastructure in science and technology departments by supporting multidisciplinary research foci and individual faculty research pursuits and training.
2. To maintain the highest of faculty productivity in teaching and service by ensuring that instructional classrooms and laboratories are well equipped and supported with adequate materials and supplies.
3. To ensure quality in the undergraduate and graduate academic programs in the sciences and technologies by providing adequate instructional support along with qualified, experienced faculty.
4. To ensure the quality of student life and services in the science and technology departments by promoting student organizations, providing internship and cooperative education opportunities, and other exposures to career opportunities.
5. To ensure student academic success in science and technology majors by providing scholarships and other financial assistance, academic assistance and mentoring, and establishing retention and graduation rate objectives for science and technology departments.
6. To maintain a high visibility for faculty, staff, and students in the College of Science and Technology within academe, the research establishment, governmental/industrial/corporate organizations, and the public at large.

From the Dean's Desk
Lei Yu, Ph.D., P.E.

A new vision for quality, value and empowerment in Science, Technology, Engineering and Mathematics (STEM)

The 2009-2010 academic year was one to remember! For the College of Science and Technology (COST), it was a time of growth through rededication, regrouping and the initial stirrings of transformation against the tumultuous background of a world in transition. We boldly moved forward together, on a number of fronts which one day will yield important benefits for broadening participation in the nation's scientific workforce.

A myriad of new initiatives were introduced in this past year. Our administration was infused with new vigor, with a talented and dedicated team of administrators. We also welcomed a new COST Advisory Board.

To add to all this, we added a new academic program in Maritime Transportation Management and Security, coupled with the new department of Environmental Science and Technology. The college is now uniquely home to diverse and competitive academic programs, with STEM education being our highest priority.
Our strides in research became longer with our innovative research centers and increased facilities and opportunities for student and faculty research. The picturesque new Science Building offers ambient classrooms and spacious research labs for cutting edge research and development. This effective education environment will be further enhanced by the construction of the new Science and Technology Building. Our students are our first priority, and to this end we established the Office of Student Services and Instructional Support to better serve their individual needs including expanded scholarship and assistantship pools. Our research has burgeoned with substantial funding procured in diverse areas from a variety of funding agencies.

We fully understand the enormous challenges which lie ahead, including issues of metrics related to enrollment and retention, improvement of program quality, accreditation, inter-departmental cooperation, and fundraising implementation. We can decisively say that together, we are ready to tackle these issues, seize unique opportunities, and continue to work hard to create a better future for our college and our students.

We hope you will share our excitement about our collective achievements this past year. I believe that the 2010-2011 academic year will be another great one. I look forward to working side by side with you in the coming year, to reach out, integrate and empower STEM education in our college, university, and community.

Lei Yu, Ph.D., P.E.
Professor of Transportation and
Dean, College of Science and Technology

Message from the Board of Advisors

Chris A. Hudson, AIA

Chair, COST Board of Advisors

Partnering with the Community and the Corporate World

A new COST Board of Advisors took up office in the 2009-2010 academic year. Ten new members were recruited from private industry, non-profit organizations and the public sector. A new member orientation session was held on October 14, 2009 for board members to learn about Dean Yu's vision for the college, to gain a better understanding of the various departments within the college, and to learn about the broader vision of Texas Southern University. The Board of Advisors meets each month during the school year to set goals, develop strategies, and monitor the progress made toward meeting those goals. The immediate focus of the board is to raise money for scholarships. This money will provide financial support for current students and allow the college to be more competitive in attracting top students from throughout the US.

To support fundraising efforts, board members accepted positions on one of the three fundraising sub-committees—industry, grants, and alumni, or the promotions or events committees. Paul Simmons leads the fundraising committee; working with the industry sub-committee, which concentrates on raising funds through industry partners led by Michael Smith of Marathon Oil Company. William Diehl of the Greater Houston Port Bureau leads the grants sub-committee, with the assignment of looking for ways to support COST grant pursuits through industry connections, and seeking grants from foundations. The alumni sub-committee is led by Cornelious Jones of OMO Science, Energy & Technology, and works with the University and COST to assemble a database of COST alumni. Outreach efforts will be made to engage alumni in conversations about the college, seek their help in reaching other alumni, and encourage giving to the scholarship program. The events subcommittee, under the leadership of Oscar Criner (COST) hosted a Partnership luncheon at the COST Science Building on February 24, 2010. Friends of the college and potential new donors were treated to a series of fascinating presentations by students in the various departments followed by a lunch and an awards ceremony.

For the 2010-2011 academic year, the Board of Advisors plans to recruit a few additional members and to continue its fundraising focus. We wish our new board all success!

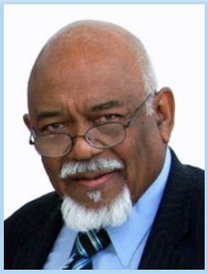
COST Board of Advisors – Industry Members

● Chris A. Hudson, AIA	Chair, COST Board of Advisors Morris Architects, President & CEO
● James A. Johnson, Ph.D., P.E.	Past-Chair, COST Board of Advisors KBR Services, Inc., National Director
● Murdock Smith	Past-Chair, COST Board of Advisors, Consultant
● Ike Allen	Linbeck, Vice President, Client Executive
● Larry Wayne Chase, Sr.	Raytheon, Senior Program Management
● William J. Diehl, P.E.	Greater Houston Port Bureau, President
● Joseph Flowers	Schlumberger, Project Manager, Completions Engineering
● Larry V. Green, Esq.	HoustonWorks USA, CEO
● Carnelious Jones	OMO Science, Energy and Technology
*Amy Moore (Alternate)	OMO Science, Energy and Technology, Vice-President of Business Development
● Lovell A. Jones, Ph.D.	M.D. Anderson, Center for Research on Minority Health, Director
● C. C. Lee	STOA International Architects, President
*Marcia Christensen (Alternate)	STOA International Architects, Business Development
● Tracy Munoz	Symantec Corporation, Senior SQA Engineer
● Danny Perkins	ESC Polytech Consultants, Principal
● Eric Potts	Dept. of Aviation, City of Houston, Acting Director
● Paul Simmons	PS & Associates, Inc., President
● Michael E. Smith	Marathon Oil Company, Corporate Facilities Planning & Real Estate, Manager
● Frank Thompson	The Work Source Gulf Coast Workforce Board, Chairman The Thompson Group, CEO
● Frazier K. Wilson, Ed. D.	Shell Oil Co., Education & Workforce Manager, Corporate Affairs

2009-2010 Year in Review

New COST Adminstration

After a national search, the Provost announced the appointment of Professor Lei Yu as Dean of the College. Dr. Yu is Professor of Transportation and a professional civil engineer. He has over fifteen years of service to the University. Dr. Yu received his Ph.D. in Civil Engineering from Queen's University in Canada, his Master of Engineering degree in Production and Systems Engineering, from the Nagoya Institute of Technology in Japan, and his Bachelor of Engineering Degree in Transportation Management Engineering from Northern Jiaotong University in China. Dr. Yu is a widely published research leader who brings new energy, vision, and direction to the College. We welcome Dr. Yu as our new Dean. Dr. Yu has assembled a team to help in the management and operations of the College.



Professor Oscar H. Criner has been appointed Interim Associate Dean for Administration and Development. Dr. Criner is Professor of Computer Science who has served the University for 34 years as the first Head of the Department of Computer Science and as the Founding Dean of the College of Science and Technology. Dr. Criner is an applied mathematician, computational scientist, and computer scientist. He received his Ph.D. from the University of California at Berkeley and his B.S. degree from Howard University. Dr. Criner's research interests are mathematical modeling and computational simulations of complex systems.

Dr. James DuMond has been appointed Interim Associate Dean for Academic Affairs. Dr. DuMond is Associate Professor and also the Interim Chair of the newly established Department of Environmental Science and Technology. Dr. DuMond has served the University for 9 years and his research interests are studying the effects of environmental contaminates on DNA repair systems and the potential loss of genomic stability.

Dr. Desirée Jackson has been appointed as Interim Assistant Dean for Student Services and Instructional Support. Dr. Jackson is an Associate Professor in the Department of Biology. She received her Ph.D. degree from the Meharry Medical College in Nashville and her B.S. from the State University of New York, College at Brockport, New York. She was a post doctoral fellow at the Institute for Molecular Genetics, Baylor College of Medicine. Dr. Jackson served TSU for 15 years and previously served as the Interim Chair for the Biology Department. Dr. Jackson heads the Office of Student Services and Instructional Support in the College and provides leadership and assistance to the students in their matriculation through the University.

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Promoting Student Success

Launching of COST Office of Student Services and Instructional Support

COST's commitment to its students gained increased momentum in 2009-2010. COST opened its multifaceted Office of Student Services and Instructional Support in Spring 2010. This office is now actively engaged in resolving registration issues, distribution of COST academic curriculum information, providing referrals for academic advisement and financial aid. This office also serves as a distribution point for information on scholarships, internships, summer programs and other student opportunities. Other activities performed through this office include: processing of student academic forms; addressing student complaints and concerns; dissemination of information regarding COST departments; and student recruitment into the degree programs of the college.

The Office of Student Services and Instructional Support also provides oversight for classroom audiovisual teaching aids; assists instructors and students with the Blackboard course platform; and provides support to faculty for selection and utilization of instructional technology. In addition to these services, the Office has represented the College at a number of recruitment events initiated by the TSU Office of Recruitment such as the Tom Joyner HBCU Student Tour; The Houston High School Counselor's Luncheon; Tiger Day; the National TSU Preview Weekend; the Pasadena Independent School District Kids2College Activities and Dia del Tigre.

All of these events were designed to attract potential undergraduate students. There were also a number of Transfer Student events such as the TSU Days at five area community colleges to attract transfer students to the college. Graduate students were targeted at the Annual Graduate School Open House. It's a win-win situation for teachers and students.

Reaching out to encourage, expand and educate

Students are COST's first priority. To validate their academic achievements, the College of Science and Technology awarded various scholarships, assistantships and other support opportunities to qualified undergraduate and graduate students. Some scholarships were funded directly by industry partners and others raised through donations. Numerous research assistantships are being provided through a number of research centers and supported through faculty research projects. The research enrichment scholarships are funded via indirect costs awarded to the college based on research funds gained through grants received by COST's different departments.

A new Maritime Transportation Management and Security Scholarship was introduced by the college, effective fall 2010. This scholarship is available to Maritime Transportation Management and Security Program majors. Scholarships are available to students admitted to the new program who meet scholarship criteria. This program is supported with funds from the Port of Houston Authority and from Texas Southern University. There are 12 scholarship awards available in each of two categories: a full scholarship includes tuition, fees, books, and etc. up to $18,000 per year; and a partial scholarship includes tuition and fees only up to $8,000 per year. The following is a list of current support opportunities for COST students.

- American Opportunity Scholarship
- Center for Transportation Training and Research (CTTR) Scholarship
- CITGO Scholarship
- Dr. Naomi W. Lede's Scholarship
- Dwight D. Eisenhower Fellowship
- Early Medical School Acceptance Program (EMSAP)
- Graduate Research Enrichment Scholarship
- Houston Louis Stokes Alliance for Minority Participation (H-LSAMP) program
- Joint Admission Medical Program (JAMP)
- Maritime Transportation Management and Security Scholarship
- NASA Center for Bionanotechnology and Environmental Research (CBER) Fellows/Scholars Program
- Prostate Cancer Summer Fellowship
- Science and Technology Enhancement Program
- Southwest Region University Transportation Center (SWUTC)
- Undergraduate/Graduate Assistanceship
- Undergraduate Research Enrichment Scholarship

Expanding Academic Offerings

B.S. in Maritime Transportation Management and Security

A new Bachelor of Science degree in Maritime Transportation Management and Security from The Department of Transportation Studies begins in Fall 2010, followed by a new Master of Science Degree in Maritime Transportation Management & Security in Fall 2012. Maritime transportation students study key issues in maritime transportation and port operations, and prepare for careers in maritime transport and logistics, maritime infrastructure engineering and management, port management and operations, security of port facilities, and environmental protection. This new program partners with the Port of Houston Authority (POHA), one of the region's main employers, and creates a program that not only positively impacts TSU students but also exposes area high school students, to maritime employment opportunities.

B.S. in Computer Science with Computer Networks Concentration

The Department of Computer Science introduced a new track in Fall 2009 which allows students to earn a Bachelors degree in Computer Science with a concentration in Computer Networks. This track is for students who plan to gain in-depth knowledge of today's rapidly growing field of Computer Networks. This track does not require students to declare a minor.

With the knowledge gained in this track, students can easily apply for and earn leading industry certificates such as the Cisco Certified Network Associate (CCNA) certificate which will improve their competitiveness in today's challenging job market where networking is an essential ingredient of almost every business.

B.S. in Physics with Health Physics Concentration

This new track in Physics allows graduates to seek immediate employment upon graduation, within the best private, government, and medical companies, or pursue advanced degrees in any related discipline. This is a vital program producing professionals that can manage safe working environments where radiation and radioactive sources are to be found (i.e. medical centers, research centers, nuclear facilities, industrial complexes, government facilities, military establishments, etc.).

There are two options for the new Health Physics track. One is Physics intensive, and will produce B.S. graduates who will find top paying positions nationally. The other has a strong bio-medical foundation and is more oriented towards Biology, with less demands on foundational physics but with equal or greater remunerative potential. Both tracks comprise the same courses during the junior and senior years (i.e.. the nuclear/health physics courses), which are more instrumentation oriented.

The Department of Environmental Science and Technology

As the modern world races past the first decade of the 21st century, the effect of mankind on the environment is a national and international concern. This focused interest in the environment has demanded a significant increase of technologically advanced workforce. The demand for individuals with formal training in the environmental sciences is high.

As a direct response to this need, the College of Science and Technology established the Department of Environmental Sciences and Technology in Spring 2010. This new department is now home to Texas Southern University's well established Environmental Toxicology Graduate Studies Program, which offers both Masters of Science and Doctor of Philosophy degrees.

In addition to housing these graduate programs, the department is currently developing an undergraduate degree program. This is being accomplished by developing strong collaborative relationships with industry so that graduates of the new program will be able to enter directly into the workforce.

Improving Academic Infrastructure

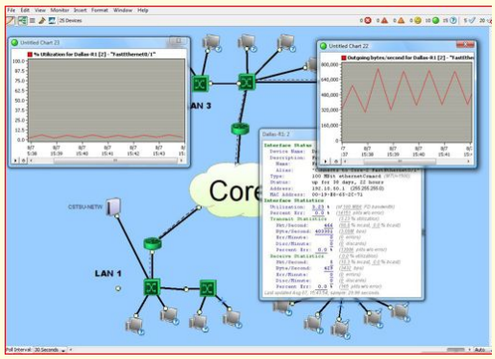
Portable Emission Measurement System

A new Portable Emission Measurement System (PEMS), OEM 2100AX Universal Axion System, from Clean Air Technologies International, Inc. was procured in 2009. This instrument measures the second-by-second real-world fuel consumption, Greenhouse Gas (GHG) and pollutant emissions from a variety of on-road vehicles and non-road equipment such as yard tractors, construction machinery, forklifts, locomotives, small aircraft, etc. Simultaneous latitude, longitude, speed, and acceleration are recorded by the GPS system, so that the emissions can be spatially positioned on urban networks by using geographic information systems (GIS) tools. This is a very convenient and powerful tool for conducting advanced transportation and environmental research in evaluating the impacts of adopting environmental-friendly traffic management strategies to air quality and energy consumption.

Advanced Computer Networks Lab

In Fall 2009, the Advanced Computer Networks Lab became fully operational to provide Computer Science students who select the new Computer Networks track with the required infrastructure for their study. This new lab utilizes the latest technologies in data networking that can be used for teaching as well as research.

The lab has network devices that simulate three Local Area Networks (LANs) which are connected together by a simple Wide Area Network (WAN). It also has software tools and hardware probes that continuously monitor the traffic in the network. This configuration provides the environment required to study and investigate protocols, techniques, traffic patterns, and applications within local area networks (such as enterprise networks) as well as wide area networks (such as service provider networks). The lab also includes all the devices required to simulate Internet Protocol Television (IPTV) as well as Voice over IP (VoIP) environments. This configuration is used to study the protocols and techniques of IPTV as well as VoIP and investigate the effect of different design parameters on the quality of video streaming service as well as the quality of voice calls provided by the network.



High Performance Computer Center (HPCC)

Texas Southern University's High Performance Computing Center (TSU-HPCC) was established in 2008 but became fully operational in 2009 to promote research and teaching through integrating leading edge high performance computing and visualization for the faculty, staff and students of the TSU campus. The HPCC provides consulting and assistance to campus researchers with experimental software and/or hardware needs. The center also provides training in parallel and grid computing. HPCC serves as a liaison between various teams that are engaged in research. The center works to support, configure and port applications to HPC resources (http://hpcc.tsu.edu/).

Center resources will be expanded to fully provide high performance computing and cutting edge computer technology to TSU researchers. Plans are in place to expand our existing resources to twice the existing capacity and start the development of a new cluster which, building upon the experience with Ares and Hades, will incorporate the new Graphics Processing Unit (GPU) technologies.

Advanced Driving Simulator Lab

The advanced driving simulator, DS-600C was upgraded in 2009. Both the hardware and software of the existing driving simulator system were updated. The upgraded driving simulators now support record & replay functions on the simulation, which provide more functions in driving data collection and safety performance analysis. In addition, new visual models and tile fixes were added to the new system.

The new audio subsystem now plays both immediate and sequenced sound samples and the new video system has higher resolution display settings for channels, and dual dvi/dvi output configuration. All these new features will significantly increase the research capabilities of the driving simulator lab.

A new desktop driving simulator system, DS-100, from DriveSafety Inc. was also added to the lab. The new desktop system, DS-100 will provide an additional platform for TSU students to develop and test driving scenarios they have designed in a driving simulation environment, which will dramatically improve work efficiency.

Virtual Airport

This project will transform TSU's Aviation Science and Technology building into a virtual airport. The first phase of this project was completed in May 2010 and includes upgrading the basic infrastructure of the aviation classrooms with the latest audio/visual components. These components include:

- **Air Traffic Control (ATC) Lab** - comprised of eight computer stations, one for the instructor, one for pseudo pilots, and six stations for students to learn basic air traffic control procedures. These air traffic control students will give other student pilots instructions to taxi to/from active runways (ground control), position aircraft for taking-off/landing (tower control), and direct the inbound and outbound traffic of destination airports (approach and departure control).
- **Flight Simulation Lab** - includes eight desktop flight simulator stations and one full motion flight simulator. Students receive instructions on aerodynamics, basic aircraft systems, crew coordination, and flight regulations.

The uniqueness of these two labs allows students in the ATC lab to communicate virtually with students in the flight simulator lab. The ATC students will give student pilots instructions for airport and enroute operations.

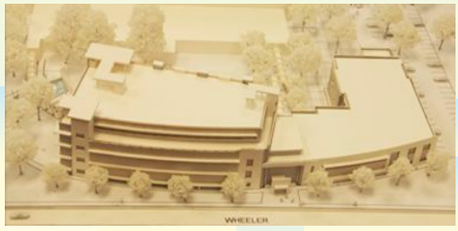
New Website and Newsletter

Having a dynamic and attractive website is central to an institution's image, competitiveness, and network establishment. This is essential to attracting prospective students (and their parents!), providing a strong global presence, and efficient delivery of information and services to students and the community. The COST Web Team, led by Dr. Hector Miranda Jr. of the Department of Biology, is working hard for the college (and TSU) to produce a world-class website comparable to major academic websites in the US.

The College began publication of "The Explorer," the newsletter of the College of Science and Technology in fall 2009. It is published quarterly both in print and an online format designed for convenient personal printing. The first issue of the newsletter was edited by the COST Research Committee. The newsletter committee comprises Dr. Shishir Shishodia (Biology), Dr. Oscar Criner (Computer Science), Dr. Desirée Jackson (Biology), Dr. Hector Miranda (Biology), and Dr. Alamelu Sundaresan (Biology). The COST newsletter is a great tool for highlighting programs and the accomplishments of students, faculty and staff in the College of Science and Technology.

New Science and Technology Building

The Leonard H.O. Spearman Technology Building suffered a vicious ravishment from the wind and water of hurricane Ike. The building has now been torn down to make way for a new building for the science complex. The new building will house the departments of computer science, physics, engineering technology, industrial technology, aviation science and technology and transportation studies.



Development

Open House and Partnership Luncheon

The first Open House and Partnership Luncheon was held on February 24, 2010 by the College of Science and Technology. It was well attended by the college's corporate partners, students, faculty, and friends. The event was held in the beautiful atrium of the new Science Building. Faculty and student researchers displayed posters describing their work in the main hall.

Dean Lei Yu opened the proceedings with a statement of the plans for the College in teaching, research and service. Recruitment of students and funding of scholarships were important objectives. The participation of community was very encouraging as the presentation by the students and faculty was well attended.

Presenters included Dr. Xin Wei who researches nanomaterials such as metalized carbon nanotubes, conducting polymer-functionalized carbon nanotubes, and polymeric composites. The research project is sponsored by US Air Force Research Laboratory and the research results led to an international patent (pending), which has been successfully licensed and transferred to NanoRidge, Inc. for further product development and commercialization.

Dr. Jason Rosenzweig and his student Chelsea McCoy described the essentials of the flown spaceflight experiment to determine the effects of reduced gravity on bacterial species. This experiment flew on the NASA STS-129 mission in November 2009.

In addition to oral presentations, COST researchers prepared poster presentations illustrating their research efforts. Chris Hudson, Chairman of the College of Science and Technology Advisory Board gave an impassioned account of the need for more participation in the industry university partnership. Dean Yu gave closing remarks and thanked the participants.

The Department of Engineering Technology Partnership with Evolution Solar

The Engineering Technology Department is currently partnered with Evolution Solar Corp. to develop a site for a solar demonstration project on TSU's campus. The purpose is to develop a Center for Solar Technology. Once the center is complete, communities can come to the college to learn and apply the latest state-of-the-art technologies in solar energy production and application.

Expanding education across continents!
International Collaboration took a new turn with COST Hosting Visitors from Beijing Jiaotong University (BJTU) and Sikkim Manipal University, India (SMU)

A delegation from Beijing Jiaotong University (BJTU), led by Vice President, Dr. Xuewei Li, visited Texas Southern University and its College of Science and Technology on November 24, 2009.

Issues related to expanding existing programs in the exchange of scholars and students and collaborative research were discussed. TSU and BJTU formally signed a cooperative agreement in 2005. The student program which began in 2009, had two students representing COST in Beijing this summer.

Dr. A. Sundaresan from the department of Biology hosted Drs. Salhan and Dutta, Deans of the Schools of Medicine and Pediatrics respectively from Sikkim Manipal University, India in January 2010. The guests met with Provost Dr. Sunny Ohia, Dr. John Sapp, Chair of the department of Chemistry, Dr. James DuMond, Interim Associate Dean for Academic Affairs, and Dr. Bobby Wilson, the Director of the Environmental Toxicology program. They discussed student exchange opportunities, and allied degree programs. Both Universities are working toward establishing a "Memorandum of Understanding" with Dr. A. Sundaresan as the point of contact.

Breaking Continental Barriers

COST students participated in the International Exchange Program between Texas Southern University and Beijing Jiaotong University (BJTU), China. The program was created in the light of an Agreement Regarding the Exchange of Students and Faculty, and Collaborative Research between TSU and NJTU, which was signed on June 28, 2005.

Three students from TSU attended the Chinese Language Study Program and participated in various activities at BJTU for four weeks in Summer 2009. Drew Browne, from Airway Science and Chelsea McCoy from Biology represented COST.

In Summer 2010, a total of 7 students (two from COST), led by Dr. Thomas F. Freeman, the Interim Founding Dean of the Thomas F. Freeman Honors College, participated in a similar student exchange program at BJTU. The exchange program between TSU and BJTU has created great opportunities for TSU students to develop a more global perspective and benefit from unique experiences in China. It will also increase the exposure of educational programs available at TSU amongst the Chinese students who might choose TSU as their future destination for study.

Research

COST Hosts Research Week Events

The College of Science and Technology was an enthusiastic and avid participant during the TSU 2010 Research Week, held during the week of March 30th, 2010. The theme of TSU Research Week was "Improving Research Initiatives Through Collaborations."

The week featured several events including presentations, panel discussions and university research and outreach center exhibits. During this event, the College of Science and Technology Research Committee organized keynote lectures and panel discussions at the TSU Science Center.

Dr. Lei Yu, Dean of College of Science and Technology, welcomed the participants which included guests from Rice University and the University of Houston. Dr. Wei Li, Chair of the COST Research Committee presented the program overview and hosted the activities. Dr. Ronald L. Sass, Harry C. and Olga Keith Weiss Professor of Natural Sciences at Rice University, presented the first keynote lecture titled "Climate Change, Energy, and Public Opinion." His talk was followed by a panel discussion titled "How do you enhance the College Research Capabilities?"

The panelists from TSU were Dr. Daniel Bessis, Department of Physics; Dr. Adebayo Oyekan, Interim Associate Provost for Research; Dr. Lalita Sen from Department of Urban Planning and Environmental Policy; Dr. Sass from Rice University and Dr. Gongbing Song from the University of Houston. The panel discussed the research environment and life at TSU.

The emphasis was placed on increasing opportunities for researchers to develop relationships amongst themselves, to develop collaborations with other research intensive universities, mentoring of junior faculty, release time for research, and persistence in the pursuit of grants. Dr. David Olowokere from Department of Engineering Technology moderated the panel discussion.

Dr. Oscar Criner from Department of Computer Science presented the second keynote lecture titled "Priming the pump: creating a new generation of scientists for the 21st Century." He advised students of the exponential increase in job opportunities in the area of software development over the next decade. This issue was discussed during the second panel discussion titled "How do you utilize your education in the advanced information based society?"

Dr. Khaled Kamel from Department of Computer Science moderated the panel consisting of Remi Ademola, TSU Center for Online Education and Instructional Technology; Dr. Bobby Wilson, L. Lloyd Woods Distinguished Professor of Chemistry; Dr. Criner, and Dr. Jerome Freiberg of the University of Houston.

The questions from the audience covered the various challenges of the present and future, including legal and social implications. Closing remarks were made by Dr. Shishir Shishodia from the Department of Biology.

Research Centers-Expanding Horizons

NASA University Research Center for Bionanotechnology and Environmental Research (NASA URC CBER)

The NASA URC C-BER is a cross-disciplinary and cross-institutional program actively engaging a talented team of faculty from the departments of Biology, Chemistry, Mathematics; and Colleges of Business, Education, Law and Public Affairs to support the outcomes of NASA's Education Strategic Framework. The principal investigator is Dr. Olufisayo Jejelowo who is also chair of the Department of Biology. The team builds strategic partnerships with educational and commercial institutions, along with government employees, to train and educate students and postdoctoral fellows. NASA C-BER integrates molecular biology, bioinformatics, and bionanotechnology with chemical and biochemical analysis to address important environmental and human health concerns related to manned exploration of space. Techniques for detection, monitoring and control of microorganisms will be developed; and the effects of microgravity, radiation and other space travel-induced stress factors on living organisms will be investigated to develop countermeasures.

This past year's milestone was the spaceflight experiment Microbial-1 on STS-129 in November 2009. Details are highlighted in the Students Achievements section in this report. The C-BER Scholars wing had a special scientific session at the Texas Academy of Sciences in Junction, Texas.

The research of C-BER is closely aligned with NASA's Exploration Systems Mission Directorate and is relevant to all NASA's mission directorates. Historically, synergism between science and technology has thrived at TSU as applied to microgravity induced stress and microbial detection/control. C-BER research successes will improve existing technologies and generate new inventions that increase speed and accuracy while decreasing cost. New technology developed or advanced will educate and drive the perception of what is possible in the realm of Space Life Sciences.

In this current effort, C-BER and COST are developing advanced technologies to enable novel solutions to the great health challenges facing humans during long-term space duration missions. Overall, COST shall develop a future workforce in STEM fields; improve TSU's research infrastructure and innovative partnerships; enhance astronaut and autonomous medical care; enhance technology transfers and commercialization; and improve quality of life on earth.

Keeping the pedal to the metal!

National Transportation Security Center of Excellence for Petro-Chemical Transportation (NTSCOE-P)

Texas Southern University's focus as a co-lead in the National Transportation Security Center of Excellence-Petrochemical (NTSCOE-P) is to investigate and advance methods and strategies that will increase the resilience of the nation's multimodal infrastructure to terrorist attacks on the movement of petrochemicals. Identifying risks and protective factors associated with petrochemical security and ensuring stakeholders' presence in security initiatives are key focal areas in this research.. This is a robust and productive center continuously striving for excellence.

The Center's team, led by Dr. Carol A. Lewis along with Dean Lei Yu and Prof. Carroll Robinson, has continued defining what data exists for the rail and motor carrier industries. During the past year, the Center increased industry liaisons and provided increased opportunities to channel research outcomes to practitioners. Active technology transfer is in progress to the Department of Homeland Security, private companies, and organizations such as Sandia National Laboratories, TEX-21, and Intelligent Transportation Systems of America.

Two annual Advisory Board Meetings provided the opportunity for industry to view the progress and confirm the Center's direction. Experience and technical knowledge of the industry enhanced objectives that were identified the previous year.

The Center submitted various proposals for funding throughout the academic year. It also held a conference in early May of 2010. Other major achievements included a consortium agreement between Texas Southern University and Long Island University (LIU) for student exchange. The Center also worked with the Houston Emergency Management Center to establish a code for Hazardous Material incidents reported to the City of Houston.

COST Scholars Publications

COST reaped a rich harvest in quality, seminal publications in excellent peer reviewed journals and conferences in the year 2009-2010.

- A. Niklasson, P. Steneteg, A. Odell, N. Bock, M. Challacombe, C. J. Tymczak, E. Holmström, G. Zheng, V. Weber, "Extended Lagrangian Born–Oppenheimer molecular dynamics with dissipation," Journal of Chemical Physics, vol. 130, 2009.
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COLLEGE OF SCIENCE

AND TECHNOLOGY

College Business Administrator

Charlotte S. Whaley

Administrative Assistant

Tioka Freeman

& Chair
Kamel

Admin. Assistant
Nadereh Jahed

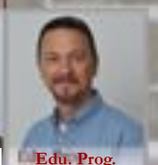
mputer Science

Professor & Chair
David Olowokere

Admin. Assistant
Cristal Mason

Engineering Technologies

& Chair
Handy



Edu. Prog. Coordinator
Clancy Weeks

Physics

Asst. Prof. & Interim Chair
Yi Qi

Admin. Assistant
Paula Eakins

Transportation Studies

Research Centers/Special Programs

- Center for Bionanotechnology and Environmental Research (NASA URC C-BER) 713-313-7499
- Center for STEM Education and Outreach (C-SEO) 713-313-7593
- Center for Transportation Training and Research (CTTR) 713-313-7924
- Computer Network Research Center 713-313-7582
- Early Medical School Acceptance Program (EMSAP) 713-313-4398
- Greater Houston Energy Collaborative 713-313-7995
- High Performance Computing Center (HPCC) 713-313-1849
- Houston Louis Stokes Alliance for Minority Participation (H-LSAMP) 713-313-7452
- Houston National Summer Transportation Institute (HNSTI) 713-313-7925
- Innovative Transportation Research Institute (ITRI) 713-313-7282
- Joint Admission Medical Program (JAMP) 713-313-4398
- NASA C-BER Fellows/Scholars Program 713-313-1032
- National Transportation Security Center of Excellence for Petro-Chemical Transportation (NTSCOE-P) 713-313-7924
- Pre-College Engineering Summer Program 713-313-7995
- Science, Technology and Enhancement Program (STEP) 713-313-7830
- Summer Maritime Academy (SMA) 713-313-4394
- The Frederick Douglas Honors Program 713-313-7778

COST Scholars Presentations

The scholarly accomplishments of our world-class faculty were recognized by their peers both nationally and internationally. Our quality faculty made an impact with plenary lectures and talks in leading symposia here and abroad.

- A Sundaresan, Committee member, keynote presenter and chairperson, "Space toxicology for the future," Interdisciplinary transport phenomena conference , Volterra, Italy, October 14-16, 2009.
- A Sundaresan, Keynote lecture, "Tissue like assemblies in analog microgravity," Scandinavian Society of Biomaterials, Hafjell, Norway, April 12-16, 2010
- A. Sundaresan, Committee member, keynote presenter and chairperson, "PlGf, a possible predictor for cardiac dysfunction in microgravity ," the European Low Gravity Research Association conference, Bonn Germany September 4-6,2009.
- B. Desta, M. C. Harvey, P.L. Gueye, Presentation, "Measurement of the Linear Absorption Coefficient in Lead", NRC Reverse Site Visit, May 5, 2010.
- C. J. Tymczak, Presentation, "Large Scale, Scalable Computing," seminar at the University of Houston, October 6, 2009.
- Carlos R. Handy, Invited Panelist, "Where do we go from here: Expanding our energy opportunities across the globe," the 2009 Congressional Black Caucus Conference, Washington D.C., Sept.18 – Sept. 26, 2009.
- D. Vrinceanu, H. R. Sadeghpour, T. Pohl, Presentation, "Rydberg atom formation in ultracold plasmas: non-equilibrium dynamics of recombination," International Conference on Photon and Electron Interactions, Kalamazoo MI, 2009.
- D. Vrinceanu, Presentation, "Three-body recombination in ultracold plasmas: small energy transfer with large consequences," Joint Fall 2009 Meeting of the Texas Sections of the APS, AAPT, and SPS Texas State University, San Marcos, October 22, 2009.
- Della Bell, Presentation, "Making Math Meaningful," The Math Summit, Museum of Natural Science, Houston, Texas, February 2010.
- Everett, Presentation, "Evaluation of Alpha and Beta Particle Ranges in Shielding Media," NRC Reverse Site Visit, May 5, 2010.
- G. Gwendolyn, Presentation, "Senior Fatalities in Texas: Who gives you the right to decide?," Hong Kong Conference on Aging, June 2010.
- G. Song, L. Yu, and Z. Tu, Presentation, "Distribution Characteristics of Vehicle Specific Power on Urban Restricted Access Roadways," The 89th Transportation Research Board Annual Meeting, Washington D. C., Jan 2010.
- K. Chilakamarri, Presentation, "Unit-Distance Graphs," Combinatorics Seminar, The Ohio State University Department of Mathematics, October 1, 2009.
- L. Perotti, D. Bessis and D. Vrinceanu, Presentation, "The J-Matrix formalism applied to noisy data series: universal properties of noise," Joint Fall 2009 Meeting of the Texas Sections of the APS, AAPT, and SPS, Texas State University, San Marcos, October 22-24, 2009.
- L. Yu, M. Liu, Q. Shi, G. Song, and J. Guo, Presentation, "A Novel Model for Identification of Key Congested Segments Based on Tree-structured Wavelet Decomposition," The 89th Transportation Research Board Annual Meeting, Washington D. C., Jan 2010.
- L. Zhu, L. Yu, Y. Zhang, X. Chen, J. Guo, and M. Sun, Presentation, "Simulation Approach to the Analysis of Exclusive Bus Lane on Western 3rd Ring-Road Expressway in Beijing," The 89th Transportation Research Board Annual Meeting, Washington D.C., Jan 2010.
- M. C. Harvey, Presentation, "Environmental Health Physics Program Overview," NRC Reverse Site Visit, May 5, 2010.
- M. Hillar, Presentation, "Radiation and Radiation Safety," Seminar at the Texas Academy of Sciences meeting, Texas Tech University, Junction, TX, 2009.
- N. L. Glenn, Presentation, "Empirical Likelihood Spirometry Reference Values," Texas Academy of Sciences Conference, 2009.
- N. L. Glenn, Presentation, "Using Empirical Likelihood Confidence Intervals to Establish Spirometry Limits," Joint Statistical Meetings, Washington D. C., August 2009.
- S. Guo, L. Yu, X. Chen, and Y. Zhang, Presentation, "The Modeling of Waiting Time for Passengers to Transfer from Rail to Buses Based-on Passenger Classification," The 89th Transportation Research Board Annual Meeting, Washington D. C., Jan 2010.
- T. Dickerson, R. Thomas, B. Wilson, Presentation, "Trace Metal Analysis of Primary Teeth as an Environmental Indicator using Inductively Coupled Plasma Mass Spectrometry (ICP-MS)," National Science Foundation, HBCU-UP Conference, Atlanta GA, October 29 – November 1, 2009.
- T. Gibson, R. Thomas, B. Wilson, Presentation, "The Effects of Metal Exposure on Normal Osteoblast Cell Development Using Primary Teeth as a Bio-Indicator of Exposure,", 113th Texas Academy Science, Stephenville, Texas, March 4-6, 2010.
- X. Chen, G. Song and Y. Zhang, Presentation, "Virtual and Remote Laboratory Development: A Review," ASCE Earth and Space 2010 conference, Honolulu, March, 2010.
- X. Chen, L. Yu, L. Zhu, Y. Zhang, Z. Lin, and H. Xie, Presentation, "Analyzing Urban Bus Service Reliability at Stop, Route and Network Level," The 89th Transportation Research Board Annual Meeting, Washington D.C., Jan 2010.
- X. Chen, Presentation, "Adaptive Rate Wireless Sensor Network and Its Applications," Nanjing University of Science and Technology, Nanjing, China, June 21, 2010.
- X. Chen, Presentation, "Adaptive Rate Wireless Sensor Network for Structural Health Monitoring," Donghua University, Shanghai, China, June 10, 2010.
- X. Chen, Presentation, "Development of Virtual and Remote Laboratory (VR-Lab)," NSF HBCU-UP project workshop, Prairie View A&M University, August 20, 2009.
- X. Chen, Presentation, "How to Conduct Evaluation for Educational Projects Involving Emerging Technology," NSF sponsored workshop for Improve Undergraduate Engineering Teaching Using Emerging Technology, ASCE Earth and Space 2010 conference, Honolulu, March 14, 2010.
- X. Chen, Presentation, "How to Develop Remote Experiment - A Quick Start," NSF sponsored workshop for Improving Undergraduate Engineering Teaching Using Emerging Technology, ASCE Earth and Space 2010 conference, Honolulu, March 14, 2010.
- X. Chen, Presentation, "Technologies for Development of Virtual and Remote Laboratory," ASEE Annual Conference & Exposition 2009.
- X. Chen, Presentation, "Unsupervised Learning for Structural Health Monitoring via Wireless Sensor Network," University of Houston, August, 2009.

- X. Chen, Y. Qi, and L. Yu, Presentation, "Application of Vehicle Infrastructure Integration Technology for Work-Zone Collision Prevention," The 89th Transportation Research Board Annual Meeting, Washington D. C., Jan 2010.
- Y. Hao, L. Yu, G. Song, Y. Xu, and H. Wang, Presentation, "Analysis of Driving Behavior and Emission Characteristics for Diesel Transit Buses Using PEMS' Measurements," The 89th Transportation Research Board Annual Meeting, Washington D. C., 2010.
- Z. Dale, R. Thomas, B. Wilson, Presentation, "The Assessment of Environmental Estrogens in the Galveston Bay Watershed," 113th Texas Academy Science, Stephenville, Texas, March 4-6, 2010.
- Z. Dale, R. Thomas, B. Wilson, Presentation, "The Characterization of Organic Compounds In the Effluent Wastewater Treatment Plants," National Science Foundation, HBCU-UP Conference, Atlanta GA, October 29 – November 1, 2009.

2009-2010 Research Awards for the College of Science and Technology

"Genius is 1% inspiration and 99% perspiration"
-Isaac Newton

The research at COST is truly remarkable in both its breadth and depth. COST's research programs reflect the expertise, creativity and initiative of the faculty who set the research agenda, and who have a long tradition of engaging with their colleagues and students to work across disciplines. New initiatives continue to break down academic boundaries and bring together collaborative teams of experts to span major scientific domains, such as those related to human health, space research, environmental sustainability, transportation, mathematics, computer networks and quantum physics.

The College of Science and Technology is committed to preparing the next generation of science, technology, engineering, and mathematics (STEM) professionals through comprehensive training and engagement. There are many research endeavors geared towards recruitment and strengthening of minority scholars in the STEM area The funding agencies which awarded research grants include the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), U.S. Department of Homeland Security (DHS), U.S. Department of Transportation (DOT), Department of Defense, Department of Air Force, Nuclear Regulatory Commission, Welch Foundation, and many other public and private organizations.

This portal highlights some examples of innovative basic and applied research at COST holding the promise of new solutions to these problems for the 21st century. The list of new and continuing extra mural research awards for the year 2009-2010 is displayed in the next pages.

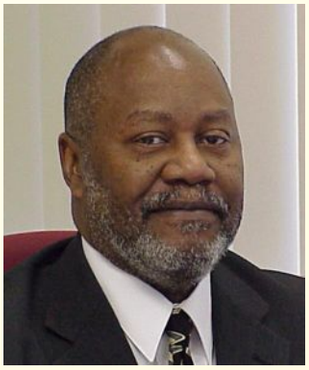
College of Science and Technology 2009-2010 Research Awards

Name	Award Amount	Title	Agency
Olufisayo Jejelowo	$1,000,000	Center for Bio-Nanotechnology and Environmental Research (C-BER)	National Aeronautics and Space Administration
Carol Lewis	$340,725	Southwest Region University Transportation Center	Texas A&M Research Foundation
Fengxiang Qiao	$328,641	Driver Understanding of Congestion-Based Pricing Messages	Texas Department of Transportation
Yi Qi	$289,998	Development of Guidelines for Triple Left and Dual Right-Turn Lanes	Texas Department of Transportation in collaboration with Texas Transportation Institute
Fengxiang Qiao	$260,000	Bicycle & Pedestrian Friendly Crossings at Freeway Interchanges	Texas Department of Transportation
Yi Qi	$251,301	Use of Flashing Yellow Operations to Improve Safety at Signals with Protected-Permissive Operations	Collaboration with University of Texas at Austin
Demetrios Kazakos	$212,545	Intergovernmental Personnel Act Assignment	National Science Foundation
Bobby Wilson	$192,500	Houston Louis Stokes Alliance for Minority Participation - Senior Alliance	National Science Foundation
Carol Lewis	$165,000	Interagency Cooperation Contract between the Texas Transportation Institute and Texas Southern University	Texas Transportation Institute
Khosro Godazi	$149,526	Summer Transportation Institute (STI)	Texas Department of Transportation
Bobby Wilson	$142,310	Materials and Manufacturing Research	Clarkson Aerospace Corporation
Xuemin Chen	$100,000	Collaborative Research: Developing Virtual and Remote Undergraduate Laboratory for Engineering Technology	National Science Foundation
Carlos Handy	$100,000	Continued Development of a New Curricula in Nuclear Environmental Protection	U.S. Nuclear Regulatory Commission
C.J. Tymczak	$100,000	Many Body Density Matrix Theory	Welch Foundation
Wei Wayne Li	$100,000	Architecture and Performance Analysis of General Bio-Molecular Network	Department of Air Force
Bobby Wilson	$89,092	Space-Based Explorations and Applications	United Negro College Fund Special Programs Corporation
Daniel Bessis	$85,122	CREST: Expanding Interdisciplinary Research at the Center for Gravitational Wave Astronomy	University of Texas at Brownsville and Texas Southmost College/National Science Foundation
Carol Lewis	$85,000	Petrochemical Transportation Security - Behavioral Awareness for Bus Drivers Training Program	Department of Homeland Security
Lei Yu	$84,000	Characterization of Exhaust Emissions from Heavy Duty Diesel Vehicles in the Houston-Galveston-Brazoria Area	Texas Department of Transportation
Carol Lewis	$80,819	Assessment of Public Involvement	Texas Department of Transportation
Bobby Wilson	$75,000	Memorandum of Understanding between Texas Southern University and the Energized for STEM Academy	Energized for STEM Academy, Inc.
Wei Wayne Li	$50,100	Designing a Wireless Communication Service Center for Disabled Persons with Modern Information Technology	Jiangxi Association for the Handicaped Entrepreneur, China
Carlos Handy	$47,500	Historically Black Colleges and Universities Educational and Research Outreach Program in Nuclear Science and Engineering	UT Austin/U.S. Department of Defense
Alamelu Sundaresan	$45,783	Biotechnology and Host Innate Immune System Research and Development Partnership in Astrobiology	United Negro College Fund Special Programs Corporation

Name	Award Amount	Title	Agency
David Olowokere	$40,000	Drafting Technology Program	Gulf Coast Community Services Association
Carol Lewis	$39,997	Recommendations for Integrating Priced Facility Preference Question into 2011 Travel Survey	North Central Texas Council of Governments
David Olowokere	$39,500	Production of High Fidelity Lunar Stimulants for Exploration Risk Reduction and Systems Analysis of Power Systems for Lunar Oxygen Production	United Negro College Fund Special Programs Corporation
Carol Lewis	$37,815	Subaward: Center for Excellence for Natural Disasters, Coastal Infrastructure and Emergency Management	Louisiana State University
Lei Yu	$33,500	PEMS-based Approach to Developing and Evaluating Driving Cycles for Air Quality Assessment	Southwest Region Transportation Research Center
Daniel Bessis	$33,194	Center for Gravitational Wave Astronomy	University of Texas at Brownsville and Texas Southmost College/National Aeronautics and Space Administration
David Olowokere	$30,000	Residential Energy Auditing Program	Gulf Coast Community Services Association
David Olowokere	$30,000	JETS-UNITE 2010 Summer Program	Junior Engineering Technical Society+E17
Carol Lewis	$20,751	Interagency Agreement between the Texas Department of Transportation and Texas Southern University (United We Ride)	Texas Department of Transportation
Yi Qi	$20,000	Investigate Existing Non-Intrusive Inspection Technologies for Port Cargo Inspections	SWUTC
Fengxiang Qiao	$20,000	Causes and Patterns of Bicycle / Vehicle Conflicts at Freeway Interchanges	Southwest Region Transportation Research Center Project,
Lila Ghemri	$17,128	Center for Excellence for Command, Control and Interoperability	Department of Homeland Security through Rutgers
Tuan Phan	$15,000	An Integrated Program of Reseach Focused on Development of Artificially Mediated Refreshable Electrochemical Biosensors	University of Texas at Austin
Carlos Handy	$12,500	Historically Black Colleges and Universities Educational and Research Outreach Program in Nuclear Science and Engineering	University of Texas at Austin/U.S. Department of Defense
Jason Rosenzweig	$9,333	Agreement between The University of Texas Health Science Center at Houston and Texas Southern University	University of Texas Health Science Center at Houston
Lila Ghemri	$9,000	Center forDynamic Data Analysis for Homeland Security	Department of Homeland Security through Rutgers
Bobby Wilson	$2,600	2010 Research and Engineering Apprenticeship Program	Academy of Applied Science
Total = $4,785,280			

Outreach

Center for STEM Education and Outreach (C-SEO)



C-SEO was established in late 2009 by President Rudley and Provost Ohia to address several areas of institutional concerns, while positioning the university to take advantage of the STEM national movement with global implications. The Center reports to the Office of the Provost and is headed by Professor Robert Ford.

C-SEO and environmental science:

As a Global Learning and Observations to Benefit the Environment (GLOBE) Partnership, C-SEO in collaboration with Tekoa Academy, a Port Arthur charter school, and the International GLOBE Headquarters Office conducted two teacher training events at Tekoa, certifying 14 teachers in GLOBE atmosphere protocol. GLOBE is an international education, earth science, and environmental program, involving students, teachers, and scientists from 110 participating countries in collecting and analyzing scientifically valid data in the fields of atmosphere, hydrology, soils, and land cover/phenology.

GLOBE participation has demonstrated increased student learning in the Earth Sciences. The Partnership also worked closely with Forest Brook middle school in North Forest ISD to establish a student GLOBE team who conducted water studies, presented their results at the Houston Live Earth event (Earth Day), and produced a report that earned commendations from NFISD Superintendent Adrian Johnson. The Forest Brook team, led by two teachers C-SEO trained in 2009, was featured on the International GLOBE web site as a model National Lab Day undertaking.

Education initiatives:

C-SEO is active with TSU's College and Career Readiness Initiative (CCRI), with its director serving as the Chemistry Department representative. CCRI will focus on working with some ten high schools in the area, most of which are major TSU major enrollment feeders.

C-SEO has also established a working relationship with the Harris County Department of Education, linking many of the 28 Independent School Districts in Harris County to the STS-129 Shuttle Launch on which TSU had the Microbial-1 experiment. Dr. Ford, the Center Director, traveled to Kennedy Space Center for the STS-129 launch, where he served as moderator for a STEM and African-American Participation Forum, hosted by NASA Headquarters.

Advocacy and visualization:

In its advocacy work for improved schools and student performance, C-SEO attended and convened community meetings in association with the Third Ward Community Cloth Education Thread. A memorandum of understanding is being fashioned to unite C-SEO and Cloth in collective efforts to expand engagement of parents and community in pursuit of quality education in Third Ward schools. Our recent efforts focused on the HISD Apollo 20 School Transformation Initiative. The C-SEO director was the recipient of the Dean's STEM Award for 2010.

Summer Programs: Balancing Tradition with Innovation

The College of Science and Technology offered several summer programs during 2009-2010. Here is a quick glimpse of some of them.

Summer Maritime Academy (SMA):

Twenty-five students from the Houston area were selected to participate in Texas Southern University's inaugural Summer Maritime Academy from June 7th – July 2nd, 2009.

The purpose of the Summer Maritime Academy was to introduce students to the maritime industry. Students learned from industry experts in the areas of logistics/ freight distribution, homeland security, and the environment. Students enjoyed field trips to destinations important to the maritime industry including the Houston Maritime Museum, Port of Houston, Houston TranStar, and the Battleship Texas.

Pre-College Engineering Summer Program:

The Department of Engineering Technologies of Texas Southern University in collaboration with UNITE-JETS hosted its Third Annual Pre-College Engineering Summer Program during the period June 14- July 9, 2010.

The program was designed to provide academic instruction, hands-on-activities and mentorship to rising 9-12th graders of the middle and high schools within Houston's Metropolitan Area. The program incorporated classroom instruction, hands-on activities, field trips and career counseling sessions.

Participants were welcomed to visit the campus and in particular COST departments. After the end of the program, the plan is to maintain a line of communication with participants and their parents, and with partnering schools in the post-program period to follow-up on participants' academic progress. The Annual Pre-College Engineering Summer Program was sponsored by UNITE, a JETS program funded by the U.S. Army Research Office.

Space, Engineering and Science Internship Program (SESIP):

The SESIP is a combination of several research training grants housed in the department of chemistry on the campus of Texas Southern University in the Environmental Research Technology Transfer Center (ERT2C) for undergraduate and high school students. The grants referenced are the National Science Foundation HBCU-UP; the National Science Foundation HBCU-RISE, NASA NSPACE Program and the Research and Engineering Apprenticeship Program (REAP) funded by the US Army through the Academy of Applied Sciences. Each intern was assigned to a mentor for a research experience. Interns are placed at Texas Southern and the University of Houston. Assignments were based on classification, major, research interest and the needs of the laboratories. Upon completion of the program, the SESIP interns are required to produce an oral and poster presentation for the symposium, and a technical paper.

During the Summer of 2009, the SESIP hosted 26 high school students, representing 14 different high schools and 4 school districts in the Greater Houston Area. The SESIP hosted 17 undergraduate students from three different universities. High School and undergraduate students were involved in 10-week research intensive intern program. Interns were paired with research professors and completed research projects for the summer.

NASA Students Pursuing Academic and Career Excellence (NSPACE) is an educational enrichment component of SESIP. Ten of the high school student involved this summer were part of this component. These students participated in math review, lab rotations and a special environmental science curriculum. The NSPACE students completed a small environmental project for the research symposium.

The end of the program cumulated in a research symposium and closing ceremony. Students made presentation of their work, and received various awards. Program Dr. Bobby Wilson is the program director for the SESIP.

Dr. Renard Thomas serves as the research coordinator for the program and Dr. Felicia Conley serves as the core lab manager. Ms. Vera McDaniels, program coordinator, and Ms. Rachel Mizzell, administrative assistant, are the administrative components of the program in the Program Management Office (PMO), Science Building, Room 403B. In addition to this staff, the SESIP has assembled a fine group of world-class scientists/professors that serve as mentors. These mentors are assisted by their very competent laboratory staff – professors, graduate and post—baccalaureate students, to successfully train and lead the participants toward research excellence.

HoustonWorks STEM Summer Camp:

With HoustonWorks USA managing student recruitment, curricula, and teaching, the TSU Center for STEM Education and Outreach (C-SEO) hosted a summer STEM Camp from July 6 – 31, 2010 for a total of 50 middle school students from local Houston school districts. The students are provided with hands-on activities based on real world experiences in the areas of science, technology engineering and mathematics (STEM). Students are exposed to a science and technology curriculum in classroom sessions focusing on STEM robotics and areas and field trips. The objective is to increase their knowledge in science, technology, engineering and mathematics and inculcate in the students problem solving abilities for transfer of learning into day to day living. Participants received a $150 stipend upon completion of the four week program. There are plans for continued collaboration with the students, teachers and schools district and parents of the students. The program also offers college and career readiness for student participants.

STEM Teacher Quality and Retention Institute (TQRI):

Twenty-six students from nine HBCU's nationwide were selected to participate in a STEM Teacher Quality and Retention Program (TQRP) Institute from June 13 - June 26, 2010 on the TSU campus here in Houston. Sponsored by Shell Oil Company, Thurgood Marshall College Fund and Texas Southern University, the Institute introduced STEM majors to teaching in mathematics and science classrooms. Students, with strong content knowledge in STEM fields were introduced to best practices for teaching, professional development in teaching, classroom management techniques, and a classroom internship experience with Forest Brook Middle School.

The Teacher Quality and Retention Institute recruits nationwide to train, and retains teaching fellows to serve in high need urban and rural schools. The program emphasized producing STEM teachers who are equipped to fill needed vacancies in mathematics and science classrooms. The Institute's goal is to develop STEM teaching fellows who promote academic achievement among all students by using research-based methods to meet the needs of diverse learners in high-need classrooms. The TSU Center for STEM Education and Outreach (C-SEO) served as host for the Institute.

Other Summer programs offered by COST are:

- Houston National Summer Transportation Institute (HNSTI)
- TSU Summer Academy, Mathematics.

Student Achievements

Beyond earth's orbit!
Students' Experiment Flies on NASA Shuttle Mission STS-129

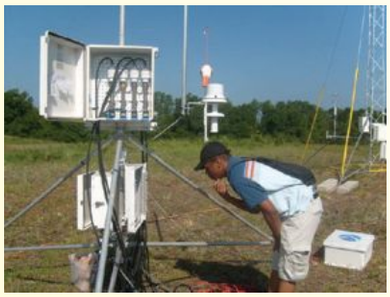
The NASA University Research Center (URC)'s Microbial-1 was the first space flight experiment opportunity for Texas Southern University. The experiment was designed by the Center for Bio-nanotechnology and Environmental Research (CBER) at Texas Southern University and used BioServe Space Technologies management support and hardware.

Students of the NASA-Center for Bio-nanotechnology and Environmental Research (CBER) University Research Center (URC) at Texas Southern University (TSU) designed an experiment that would evaluate both morphological and molecular changes in Escherichia coli and Bacillus subtilis while aboard the 11 day STS-129 mission launched last November 16, 2009.

The microorganisms were loaded in fluid processing apparatuses (FPAs) within Group Activation Packs (GAPs), BioServe Space Technologies flight hardware, on Earth and activated for growth during orbit. After the designated growth time periods the samples were preserved for future morphological and molecular analysis.

FPAs designated for morphological studies were fixed using paraformaldehyde, while the FPAs for molecular analysis were be stabilized with RNAlater II (Ambion). CBER's website contains the details of the experiment.

Student Contributes to the National Oceanic & Atmospheric Administration (NOAA) Atmospheric Dispersion Model



Samuel Ubanyionwu, a NOAA scholar from Texas Southern University, mentored by Dr. LaToya Myles, participated in the Mississippi Coastal Atmospheric Dispersion Study. In June 2009, Samuel measured atmospheric nitrogen and sulfur compounds at two sites just north of the Gulf of Mexico. Data from Samuel's field research have been incorporated into atmospheric dispersion models to identify potential emissions sources.

Mr. Ubanyionwu received the American Opportunity Scholarship in the Spring of 2010. He graduated as the salutatorian of the May 2010 class with a BS in Chemistry.

Students Win the Third prize in the 2010 Undergraduate Active Vibration Control Competition

Mr. Daniel Osakue and Mr. André Seals, students of Computer Engineering Technology program in the Engineering Technologies department, won the third prize in the Undergraduate Active Vibration Control Competition. This activity was organized by the ASCE Earth and Space 2010 conference which was held in Honolulu, Hawaii, from March 14 to March 17, 2010. It was an international competition that included two teams from China. The TSU team was the only team which implemented an advanced Fuzzy Logic controller to control a complex flexible beam system. With just a short training in the Smart Materials and Structure Laboratory at University of Houston, the TSU team successfully developed the Fuzzy Logic controller. The Matlab simulation results showed that beam vibration could be stopped in less than 2 seconds which is close to the best performance that can be achieved.

Encouraged by the superior simulation results, the team implemented the advanced control algorithm in a real system that has a flexible beam with a piezoceramic sensor and actuator attached. Due to the very limited hands-on training time, the team could not completely filter out the high frequency excitation existing in the real control system. The team was recognized by student competition organizers and the conference general chair, Dr. Gangbing Song for their creativity and hard work. Mr. Osakue and Mr. Seals were mentored by Dr. Xuemin Chen. Thanks goes to the National Science Foundation grants which made the students' trip possible.

Awards

A clean sweep by COST!
Faculty Excellence Awards 2009-2010

The COST celebrated winning all the Texas Southern University Faculty Excellence Awards for 2009-2010. The Presidential Achievement Medal was awarded to Dr. Marian Hillar, Professor in the Department of Biology. Dr. Hillar has written more than one hundred publications, ranging from biochemistry to the philosophy of humanism. He is the current President of the Socinian Society.

The Faculty Award for Mentoring Undergraduate Research was won by Dr. Lila Ghemri Associate Professor from the Department of Computer Science. Dr. Shishir Shishodia, Assistant Professor of the Department of Biology, received the Scholarly Research/Creative Activities Award.

Our pride and joy!
COST Faculty and Staff Awards

The College of Science and Technology faculty awards were given in a ceremony on April 29, 2010 to faculty and staff for outstanding scholarship, research, and service. Faculty awards went to Dr. Lila Ghemri, who received the Distinguished Undergraduate Advising Award; Dr. Shishir Shishodia received the Distinguished Research Award; and Dr. David Olowokere, who received the Distinguished Service Award. The Distinguished Staff Award went to Ms. Nadereh Jahedmotlagh.

The Deans Leadership Awards went to Dr. Hector Miranda, Dr. Shishir Shoshodia, Dr. Wei Wayne Li, Mrs. Paula Eakins, Dr. Robert Ford, and Dr. Carol Lewis for demonstrating exemplary leadership in the College. Go faculty and staff! Reach for the stars!

Homecoming

Veni Vidi Vici! I came I saw I conquered!

COST was victorious in the Homecoming 2009 events. The Alumni Homecoming Fest on October 27th, 2009 was held in the atrium of the TSU Science Center and one alumnus from each department was recognized as the outstanding alumnus for the year and presented an award.

The undergraduate students nominated and selected a COST King, Mr. Onyi Denzel Duruji, and Queen, Ms. Bianca D. Garland.

COST competed in the Campus decoration contest and the Department of Transportation Studies won second place for office decorations. At the Homecoming 2009 Parade, the Dean, Dr. Lei Yu, participated and entered the truck contest and won first place while the COST float was awarded second place. We are very proud of the entire Homecoming Committee members who helped support this wonderful effort.

In the Spotlight

Students Spotlight

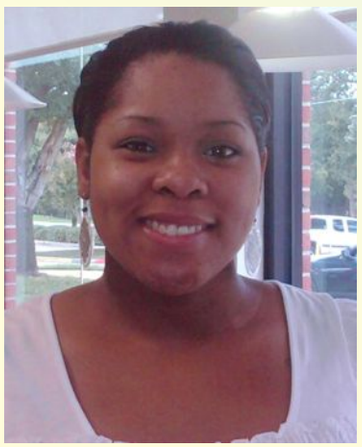
Andre White, Department of Mathematics

Andre White is a senior student majoring in Mathematics with a minor in Electrical Engineering Technologies. Since he joined TSU in 2007, he has been leading a productive academic life that is full of achievements. In the past three years, Andre participated in several summer research projects and programs such as the Space, Engineering and Science Internship Program (SESIP); NASA Research Engineering and Mentoring Project; IMRAM Summer Institute for Juniors, Louisiana State University; and the L.L. Clarkson Research Experience for Undergraduates Program. In addition to these summer programs, he also participated in several conferences such as The Conference for African American Researchers in Mathematical Sciences (CAARMS 15) at Rice University in June 2009. In July 2010, Andre had a poster presentation about Discrete Dynamical Systems at Howard University which was a result of his work in the L.L. Clarkson Research Experience for Undergraduates Program.

Through his period of study in TSU, Andre received several awards and recognitions such as the Louis Stokes Alliance for Minority Participation (L-SAMP) Scholarship (2007-2011), Men for Change Scholarship (2007), Dean's List (Fall 2008), Honor Roll, Spring 2008 and Fall 2008.

Andre is a member of the Mathematics Club at Texas Southern University, The National Technical Association (NTA), and the STEM Scholars Association at Texas Southern University.

Samantha Everett, Department of Physics



Samantha Everett is the youngest of three children born to Lloyd and Sally Everett. Her parents always stressed the importance of education and encouraged their children to attend college. She is currently majoring in Physics with a minor in Mathematics. After graduation, she plans to continue her education and obtain a Ph.D. She plans to teach and inspire other minorities to explore the STEM fields.

While attending TSU, she has been an active member of University Players, Chemistry Club, Society of Physics Students, National Society of Collegiate Scholars (NSCS), and Golden Key International Honour Society. She is also a recipient of the Houston Louis Stokes Alliance for Minority Participation (LSAMP) scholarship and General University Scholarship. Throughout her collegiate career, Samantha has maintained a 3.4 GPA. Through the LSAMP program, she has been able to travel to the 2009 Richard Tapia conference in Portland, Oregon and the 2010 Society for Advancement of Chicanos and Native Americans in Science Conference in Dallas, Texas. She has also traveled with the physics department at TSU to the Health Physics Society Mid-Year Meeting and Minority Serving Institutions Technical Assistance and Capacity Building Conference. With NSCS, she has traveled to Orlando, Denver, and Washington, D.C., for national conventions and regional summits.

Latissha Clark, Department of Transportation Studies

Latissha Clark is a Graduate Research Assistant at Texas Southern University in the Transportation Studies Department. She was born and raised in Memphis, Tennessee. She graduated from Whitehaven High School and continued her academic journey at Texas Southern University. She obtained her Bachelor of Science degree in Airway Science Management. Ms. Clark is a 2008 recipient of the Dwight D. Eisenhower Fellowship sponsored by the Federal Highway Administration. Ms. Clark interned as a Student Engineering Technician, at the Air Force Research Laboratory at Wright Patterson Air Force Base in Dayton, Ohio. Ms. Clark's research with the Air Force involved data mining techniques and Behavioral Learning Analysis for Simulated Tactics (BLAST). Ms Clark has also interned at the Houston District Office of Congresswoman Shelia Jackson-Lee working with cases for district constituents' involving veterans affairs, and housing issues. Her internship experience also includes the Dr. Ron E. McNair Educational Science Literacy Program (DREME) where she networked with local and national companies for the program's Annual Gala.

While pursuing her Master of Science in Transportation Planning and Management at Texas Southern, Ms. Clark was the Vice-president of the student chapter for the Institute of Transportation Engineers. As a Transportation Studies alumnus Ms. Clark serves on the Advisory Board for Texas Southern University's Airway Science Program. She has been a recipient of the National Transportation Defense Association Scholarship. Ms. Clark also serves as Young Member of the Transportation Research Board Task Force on Aviation Security and Emergency Management. When not studying, she enjoys spending time with her family; reading and playing her Xbox360.

Faculty Spotlight

Dr. Hector Miranda, Department of Biology

Hector Miranda is an Assistant Professor in Biology who joined Texas Southern University five years ago. Hector' s work is at the intersection of ecology, evolution and conservation biology. He received his BS and MS in Biology from the University of the Philippines at Los Banos (UPLB). He completed his PhD at the University of Cincinnati. In 1992, he participated in the Philippine Biodiversity Inventory, and in 1998 he was invited by the Peregrine Fund, a US-based organization focused on the research and conservation of the world's birds of prey, to lead the scientific efforts for the Philippine Eagle. His biggest legacy was the mentorship and training of local scientists, many of whom are now at the forefront of conservation science in the Philippines. His brilliant work in the Philippines was documented and cited by CNN, National Geographic Society (February 2008), and other institutions.

Dr. Miranda joined Texas Southern University as a tenure-track Assistant Professor in 2005, bringing with him a treasure trove of real-world global experiences from diverse fields of science, which he now shares with graduate and undergraduate students of the biology department. He is currently attempting to introduce new courses into the biology curriculum and bring new perspectives to TSU while spending time working on the development and maintenance of the College of Science and Technology's website. He is also a Co-Investigator in the NASA C-BER center.

Staff Spotlight

Helen Pittman-Cockrell, Department of Biology

Helen Pittman-Cockrell has been employed at Texas Southern University in the Department of Biology since August of 1984. She received her Bachelor of Business Administration majoring in Office Administration from Delta State University, Cleveland, Mississippi in 1984, and an Associate Arts Degree majoring in Business Education and Secretarial Science from Coahoma Junior College, Clarksdale, Mississippi in 1982. She has held the positions of Secretary, Senior Secretary, and most recently, Administrative Assistant.
Throughout her 26-plus-year career at Texas Southern University in the Department of Biology, she has served under 7 Department Chairs. She has worked on the "people management" side of running an office interacting with many faculty, staff, students and visitors. Ms. Pittman-Cockrell has supervised numerous undergraduate and graduate students. She played a role in setting up the department's Instructional Enhancement Center and Computer Laboratory, which is designed to offer students tutoring and computer assistance. Through her work she has accelerated student progress towards achieving their academic goals and has positioned herself as a valuable resource in a variety of situations.

Over the years, Ms. Pittman-Cockrell has served on numerous departmental, college, and university committees (Grievance, Homecoming, Recruitment and Retention, Scholarship, COST Open House, etc.). In the community, she has served on the Board of the Zoe Learning Academy, a Houston charter school for the first two years of their inception.
"Each day I try to raise the bar within myself. I strive for excellence in all that I do. I strive to serve as part of the solution and not the problem. There are two quotes that I feel are instrumental as I conduct my day-to-day responsibilities:

- The ability to concentrate and to use your time well is everything if you want to succeed.
- We are what we repeatedly do. Excellence, therefore, is not an act, but a habit."

Alumni Spotlight

Perry Millar, AAE, IAP

Perry Miller is an accredited Airport Executive who has distinguished himself by completing years of training to become a member of the American Association of Airport Executives (AAAE), and the Airport Management Professional Accreditation Program (AMPAP). After graduation from Texas Southern University with degrees in Airway Science (B.S.), and Transportation Planning and Management (M.S.), Perry spent the next 19-years working with the Houston Airport System, where he has evolved from a tenacious foot soldier into a leading airport manager.

Perry remembers the early days, working for days-on-end, on a project, telephoning hundreds of airport personnel, to verify their numbers for the airport system telephone directory. It was tedious work that required a pleasant temperament and helped teach him the level of commitment, demanded for advancement. He contrasts that with the daily battles he waged, with often hostile taxi-cab drivers, while he supervised the ground transportation section at William P. Hobby Airport and parking at George Bush Intercontinental Airport.

Perry has served in a myriad of airport arenas, including Management Analyst, Assistant Superintendent of Airfield & Grounds, Senior Airport Properties Representative, Airport Business Development Coordinator, and Airport Manager for Ellington Field. Perry is a ranking member of the Management Team for the eighth busiest airport in the United States.

In his position as Assistant Director of Maintenance at IAH, he commands a team of hundreds that must anticipate and juggle the needs of passengers, pilots, flight attendants, visitors and personnel, associated with the 19 domestic and elite international air carriers that operate from IAH. He does this, while also maintaining a commitment, to provide all who set foot in the airport with a superior customer experience. Perry has proven that he is what solid leaders are made of; a person who can easily be hands-on and also in charge. He is originally from Chicago, Illinois, but, has been in Houston long enough to genuinely address a group – using the Texas – "y'all." He is a passionate student of all things airport related, who has spent his life building powerful leadership skills, all that while balancing strong family bonds with his wife Tanya, and four children, two of whom he is in the process of adopting. Perry attributes part of his success to his experience at Texas Southern University. Studying hard for exams, being prepared to participate in class discussions and being engaged with university activities such as student government, student chapters of professional organizations and the university's debate team were of paramount importance in preparing him for life after college.

LaKeisha Melton

LaKeisha Melton graduated from Texas Southern University in December 2006, with a major in Computer Science and a minor in Electronic Engineering Technology. Her career began in March 2007 at the Fluor Corporation, a Fortune 500 Company in Sugar Land, Texas. She began working as Technical Support for an Estimating Software. Ms. Melton traveled nationally and internationally to train users within the company on how to utilize and implement the software on their estimating projects, and provided technical support throughout the project's duration. After her first year, she began not only providing technical support for users and training users, but started testing the application to ensure it was compatible with the company's network servers and is functioning effectively without errors. She became the liaison between the company's IT Team, the software vendor, and the Estimating Community. After her second year, she was promoted to Technical Lead of the application which entails overseeing a team of technical support members nationally and internationally to insure that they were properly trained to provide technical support to the users during their projects.

Now in her third year at the company, Ms. Melton currently manages, leads, implements, develops, supports, and trains users on five different applications. She is an active member of the Graduates Advancing to Professionalism (GAP) organization which is an organization at Fluor for new college graduates that bridges the gap between new grads and the industry and she is presently the only graduate from TSU. She has served two terms on Fluor's GAP steering committee. During her first term she was responsible for the Quarterly Newsletter and served as Co-Chair of Website Development. Currently she is the Website Development Chair. Ms. Melton also serves on the steering committee for Golf For Fort Bend, an annual Golf Tournament through Fluor's Houston office, which provides support to local Fort Bend charities who are going above and beyond the call of duty to support their community. She also serves as the current Website Development/Publicity Chair.

Ms. Melton is working with Fluor's Human Resources Department in an effort to facilitate recruitment of students from TSU. Her internship at Washington State in the summer 2006, LSAMP, as well as the opportunity to tutor other computer science students, provided her with the necessary experience and knowledge to enter the business world and be successful.

Alumni, Partners, and Friends

COST Alumni Task Force

On June 9, 2010, an Alumni Task Force was formed to facilitate the development of an active Alumni Association for the College of Science and Technology. This Task Force is headed by Perry Miller and consists of Derrick Wilson, James Dumond, Jim Dickinson, LaKeisha Melton, Roben Armstrong, Roderick Holmes, Vincent Sanders, Ed Booker, Cleverick Johnson, Charlotte Smith-Baker, Chelsea Harris, Shelley Smith, Kedrick Lyons, Martina Gallien, and James Cox. Other Alumni will be added in order to have full representation by all departments in the College. The Task Force, which meets on the second Wednesday of each month, started by building a contact data base for the College of Science and Technology Alumni. This will be used to establish a functioning, valuable and supportive Alumni Association. Currently the Task Force has over 500 Alumni contacts and is working hard to engage all TSU Alumni locally and nationally in the building process.

2010 Company of the Year Award

TSU College of Science and Technology awarded KBR a recognition as Company of the Year for the long term support given to the college by the firm. KBR has been associated with TSU since it was known as Brown and Root Construction Company. In its evolution to KBR, the company has remained deeply involved with the College of Science and Technology. Dr. Jim Johnson, National Director of Government and Infrastructure Management and Engineering accepted the award for KBR presented by Associate Dean Criner and responded to the luncheon audience. Other industry partners and members of the advisory board include: The Linbeck Group, Raytheon Technical Systems, STOA Architects, The Greater Houston Port Bureau, Schlumberger, HoustonWorks, and Morris Architects. The College looks forward to other companies becoming so engaged with COST that there are many "Companies of the Year" to follow.

Our Generous Patrons

Port of Houston Authority (PHA) Commissioner Dr. Kase Lawal presented to TSU President Dr. John Rudley a check for a $1 million dollar donation to support the maritime program at Texas Southern University (TSU). The $1 million dollar check was the second installment of a $2 million dollar pledge by the Port of Houston Authority to TSU for the establishment of the maritime program in its Department of Transportation Studies. TSU, in a partnership with PHA, begins to offer a new bachelor of science degree program in Maritime Transportation Management and Security in Fall of 2010. The program is designed to address three national priorities: logistics/ freight, security, and environment.

We thank all those individuals, corporations, organizations, foundations, government agencies, faculty and staff that have contributed so generously to improve and further the goals of COST in 2009-2010 . While we strive to be accurate, we apologize for any errors or omissions.

Our Partners, Friends and Alumni

- **$2,000,000**
  - Port of Houston Authority
- **$20,000**
  - Kellogg Brown and Root Inc.
- **Under $10,000**
  - Aaron Dillard
  - Allen Stringfellow
  - Archi Technics/3, Inc
  - Commemorative Air Force Inc./Wings Over Houston Airshow
  - Conoco Phillips Company
  - Della Bell
  - H. Fort Flowers Foundation, Inc.
  - John Ramsey
  - Joseph and Lori Flowers
  - Joyce Ratcliff
  - Linbeck Group Inc.
  - Llayron L. Clarkson
  - Michelle Davis
  - Morris Architects
  - Paul Simmons
  - Raymond Hubbard
  - Raytheon Charitable Giving
  - Symantec Corp.
  - W.S. Bellows Construction Corp.
  - Wallace Henderson

COST 2010 Faculty/Staff Giving Campaign Participants

- Baker, Vernon
- Bell, Della
- Bessis, Daniel
- Chen, Xuemin
- Cheung, Lily
- Criner, Oscar
- DuMond, James.
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