Greetings again from the College of Science! This second edition of Maverick Science highlights another exciting semester and summer for the College. The spring semester began with the opening festivities for the Chemistry and Physics Building and the Planetarium. Both of these are great additions to the campus, and we were honored by the many officials, friends and alumni who could join us for these events. We also have been fortunate to recruit more topnotch faculty who will greatly increase both the quality of our education and our national visibility. Of course, our new research faculty and increased research activities will quickly outstrip the available space. The space vacated in Science Hall is not suitable for renovation as a modern research and teaching facility. We are delighted that we have been approved for a $30 million wing in a new engineering and science research building. This will be completed in 2010. The eventual plan is to replace Science Hall with a new state-of-the-art building for the expanding educational and research needs of the College. We are excited about the progress we have made in the past few years and the great prospects for the future. We hope you enjoy reading about some of the happenings in the College, and please do let us hear from you. To become a top college and university will require strong alumni support for scholarships, named professorships and research enhancement. Please consider investing in your College and the status of your degree now or when you receive a call during the coming year. Visit us online at www.uta.edu/cos.

Paul B. Paulus
Dean, College of Science
UT Arlington

Cover: Picture of a photoreactor from The Center for Nanostructured Materials (page 4). Inset pictures of Dr. Dasgupta and Dr. Baum (page 2), ribbon cutting of the new Chemistry and Physics Building (page 6), and Science Olympiad event (back cover).

The University of Texas at Arlington is an equal opportunity/affirmative action employer.
How do you build a great College of Science? Of course, you need modern buildings, the latest equipment, smart students—but you cannot have a great College without great professors! We have had a long history of fine scholars and teachers and have been fortunate to bring in over 30 new faculty members in the past three years. Yet, it is not always easy to get attention for the kind of growth in quality that we have experienced. That may be about to change. We are continuing to draw some top scholars in their fields to UT Arlington. For example, in the past few years we recruited Dr. Robert Gatchel from the University of Texas Southwestern Medical Center at Dallas and Dr. Daniel Armstrong from Iowa State University. Both held named professorships at their universities, are top scholars in their fields, and have significant external funding for their research. These two scholars have been instrumental in bringing two more top scholars to our campus—a health psychologist from the University of Pittsburgh Medical Center and an analytical chemist from Texas Tech.

Dr. Andrew Baum was the Director of the University of Pittsburgh Cancer Institute, Behavioral Medicine and Oncology Program and Deputy Director for Cancer Control and Population Sciences. He joins the Department of Psychology to help develop a similar program in conjunction with the University of Texas Southwestern Medical Center. Dr. Baum will establish a biomedical science laboratory at UT Arlington and collaborate with UT Southwestern in developing a comprehensive cancer center for the North Texas region. Dr. Baum and Dr. Gatchel are among the founders of the field of health psychology. Dr. Baum has made many significant contributions in the areas of environmental health, stress and cancer and is editor of several major journals. His research has been continuously funded for 25 years by the National Institutes of Health. He will be joined by one of his colleagues, Dr. Angela Dougall, whose specialty is in health psychology and biostatistics. The neuroscience and health psychology program here at UT Arlington ranks high among the top programs in the country with the collaboration of Baum, Gatchel and other faculty.

Dr. Purnendu “Sandy” Dasgupta is the Paul Whitfield Horn Professor in Chemistry at Texas Tech University and will become Chair of the Department of Chemistry and Biochemistry in January 2007. He is an internationally recognized scientist in environmental chemistry and air pollution chemistry. His research has been funded by a variety of agencies, including the National Science Foundation and the United States Environmental Protection Agency. He will be a great addition to both the analytical chemistry program and the interdisciplinary Earth and Environmental Sciences Program. The addition of Armstrong and Dasgupta to the analytical chemistry group make this a top 10 program. Armstrong, Dasgupta and Professor Krishnan Rajeshwar are editors of three of the top journals in the field. Dasgupta brings with him a group of six graduate students and eight postdoctoral scholars. Professor Dasgupta and his team provide greatly needed expertise on air pollution in this region, and they will collaborate with scholars in the College of Engineering and area universities on various projects. His recent interests in health-related aspects of pollution will likely mean that there will even be some collaboration with Professor Baum.

Our first show at the Planetarium was entitled “The Stars at Night are Big and Bright.” This has been an exciting show about our Universe. We are excited that we now have our very own “star show” in the College with the addition of these top new faculty members and the other new faculty who have joined in the past few years!
Leadership Giving: Paying It Forward

“Not a day goes by that I don’t appreciate the priceless foundation in life that I received at UTA. Any service or time or money I give back to this institution is just a token of my gratitude.”

- Maxwell Scarlett

Dr. Maxwell Scarlett in the new Chemistry and Physics Building

Dr. Maxwell C. Scarlett has been the subject of many articles since it was “discovered” a few years ago that he was the first African-American student to graduate from UT Arlington. He has been recognized with many awards and honors, including the Outstanding African-American Alumni Award in 2004, the Multicultural Services Trailblazer Award in 2005, and Distinguished Alumnus of the College of Science in October 2005. The awards are numerous and well deserved, but they don’t tell the whole story behind his long, close relationship with the University. As one of the most loyal financial supporters of the College of Science, Dr. Scarlett’s deep love for his alma mater is tangible, but perhaps unexpected, considering that he only attended classes here his senior year. What made his time here so memorable in the context of a lifetime of stellar accomplishments?

Destined for success from a young age, Scarlett credits his mother, Evelyn Guinn Scarlett, as the source of his earliest inspiration and encouragement. She graduated from I. M. Terrell High School in Fort Worth at the age of 15 and completed her bachelor’s degree at Prairie View A&M in four years. She married at the age of 20 and gave birth to her son Maxwell at 21. She went on to earn her masters degree at North Texas State University in Denton and taught in the Fort Worth public schools for many years. Two of her brothers were physicians, so young Maxwell grew up in an extended family that valued education and expected high academic achievement. In his household it wasn’t “if you go to college” but “when you go to college.” When asked if he always knew he wanted a career in medicine, Scarlett answers “Yes!” quickly, and then adds with a grin “...and a teacher, and a lawyer, and a preacher, too. I wanted to do it all, and there just weren’t enough hours in the day.”

His parents divorced when he was quite young, but his mother maintained her high expectations for him. She always knew where he was and what he was doing, a challenge for a single working mother in any era. After his graduation with honors from Dunbar High School, Scarlett followed in his mother’s footsteps by enrolling at North Texas State. An outstanding student since his days as kindergarten valedictorian, he made the Dean’s list and was a member of Beta Beta Beta, a national biological honor society. He enrolled for a few summer classes at UT Arlington between his years at North Texas, and then one fateful day he accompanied his mother to the Vandergriff Chevrolet dealership where she bought a new car. Hooker Vandergriff expressed a personal interest in the bright young pre-med biology student and asked him to consider UT Arlington, which he highly recommended. Growing disillusionment with random incidents of racial prejudice at North Texas convinced Scarlett to reconsider the local university, where he spent a very productive and successful senior year – a year that made a lasting impression on him.

“Not a day goes by that I don’t appreciate the priceless foundation in life that I received at UTA. Any service or time or money I give back to this institution is just a token of my gratitude.”

Some alumni who go on to professional schools support those schools, but don’t retain ties to their undergraduate institution. Not so with Maxwell Scarlett. When asked what motivates his continued generosity to the University, he doesn’t hesitate.

“I enjoy giving back to UTA because of the tremendous impact UTA has had on my professional and personal life, coupled with a family history of community service and a fervent desire to pass forward to others as much as possible of what has been passed to me by those who preceded me.”

Still active as a contract emergency medical services physician in the Killeen area, Scarlett divides his time between Fort Worth and central Texas but stays in close touch with campus news and events.

“I see the results of what UTA has accomplished and the goals it is still striving to reach. I feel it’s my responsibility and the responsibility of my fellow alumni to help the University accomplish those goals.”
Nano is a buzzword that seems to be heard more and more often. All that most people know is that it means “small.” In fact, it involves the study of phenomena that occur at the atomic or cellular level. Interestingly, materials that are reduced to nanoscale may have very unique properties. One of the key collaborative research centers in the College of Science is focused on the applications of nanoscience to materials.

The Center for Nanostructured Materials (CNM) was started in 2003 and is comprised mainly of 19 faculty members, from the Physics and Chemistry & Biochemistry Departments. The Center includes a 2,500 square foot instrument facility in the new Chemistry and Physics building which houses specialized equipment for the characterization of nanostructured materials. Over the past three years, more than $2.3M has been invested in equipping this facility to provide researchers with state-of-the-art instrumentation in nanotechnology.

Some of the exciting research that takes place in this facility is focused on developing new processes to convert light energy (sunlight) into chemical energy, such as splitting water into hydrogen and oxygen. Hydrogen can be used as a non-polluting fuel both to generate electricity and to potentially power automobiles. The recent spikes in oil costs as well as the increasing concern over CO2 emissions make hydrogen an exciting alternative.

Other projects focus on making new super-magnets. The incredible properties of these nanomagnets are due to the control of their internal structure at the nanolevel. Dr. Ping Liu, a faculty member of the Physics Department, and his group are now making nanomagnets whose performance far surpass that of the best regular magnets. These magnets have numerous applications in power generation, data storage, and transportation. These nanomagnets can deliver performance at a fraction of the weight of comparable “macroscopic” magnetic materials.

As we struggle with the cost and repercussions of using fossil fuels, UT Arlington is working on how to end this addiction. The next time you hear “nano,” remember that this small word which describes small things will make a huge impact on the world economy and the quality of our environment.

![A photoreactor: a light source is surrounded by a solution containing a photocatalyst to maximize the amount of light absorbed. An ultrabright diode lamp is used for the light source as it minimizes heat buildup and irradiates the sample at the appropriate wavelength.](image)

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Danny Dyer is an expert on reliability theory. How fitting, since the Department of Mathematics has been relying heavily on him for almost fifty years. Dyer came to Arlington State College as a freshman in the fall of 1956 almost by accident. After graduating from Grand Prairie High School, he had spent the summer loading furniture into railroad boxcars, and the only thing he knew for sure about his future career was that it would not involve manual labor. On a whim, he and three high school buddies decided to attend college only days before the fall semester began.

Dyer spent his high school career coasting through classes without studying, knowing he would receive the standard “C” grades given to athletes who showed up for class and didn’t cause trouble. He had no idea how much effort would be required in college, and his freshman grades reflected those misconceptions. The “F” in algebra and “F” in trigonometry are particularly ironic, considering his later career choice. Instead of dropping out like his friends did, Dyer’s competitive streak kicked in, and he decided to figure out what his professors expected. It’s no surprise that he was earning all A’s by his second year on campus. What is surprising is that he’s still here, in the final years of an outstanding academic career that culminated in his leadership of the Mathematics Department as chairman from 2000 to 2005.

When he completed his undergraduate degree in 1961 as a member of the first UT Arlington baccalaureate graduating class, Dyer went on to earn a Master’s degree in mathematics at Southern Methodist University. He returned to Arlington State College in 1963 as a statistics instructor and became an assistant professor in 1966. In 1970 he completed his Ph.D. in Statistics at SMU, and soon became well known in the field. His research in reliability theory created a demand for his services as a consultant to high-profile clients such as Los Alamos National Laboratory, Northrop Grumman Corporation, the U.S. General Services Administration and Lockheed Martin. He was also in demand as an expert witness in paternity suits before DNA testing was readily available. Attorneys frequently hired him to testify on the statistical probability of their clients’ alleged paternity based on the genetics of blood typing.

A lifelong sports fan and avid golfer, Dyer’s home is a treasure trove of sports memorabilia that threatens to outgrow the bounds of his comfortable house on the shores of Lake Arlington. Instead of scaling back to a smaller home as many retirees do, he is designing a Texas Hill Country retreat that is even larger. In the final years of his career, Dyer is still active in the Math Department. He hopes to develop and teach a course on the statistics of baseball before he retires - a suitable blending of his passions for the sport and stats. His enthusiasm for his chosen field is still strong.

“This is the greatest job in the world,” he says when asked to reflect on his years as a professor. “If you love research, your work feels more like a hobby than a job.”

In preparation for Dyer’s eventual retirement, the Mathematics Department hired Dr. Jianping Zhu from the University of Akron as chairman last August. With Zhu’s outstanding credentials and expertise in numerical algorithms and computational simulation, the department is in good hands. The torch has been passed, but Danny Dyer will be around for a few more years to share the knowledge and wisdom gained in a 50 year span of association with UT Arlington.
New Chemistry & Physics Building Opening

The College of Science celebrated the opening of a state-of-the-art Chemistry & Physics Building in March 2006 with a three day series of events. A private reception for donors to The Planetarium at UT Arlington kicked off the festivities on March 3rd and featured remarks by President James Spaniolo and the unveiling of a plaque honoring founding members. After a wine and cheese reception and a performance by the UT Arlington string quartet, donors and their guests were escorted to their personalized seats for a private premier showing of “The Stars at Night Are Big and Bright.” The show was created by planetarium director Robert Bonadurer for the grand opening and narrated by Tony Arangio and Karen Borta, UT Arlington alumna and Channel 11 news anchor.

The campus community joined city and state leaders at the formal building dedication on March 4th, which featured UT Arlington alumnus and astronaut retired Brig. Gen. Robert Stewart, Texas State Senator Chris Harris and Regent Robert Estrada. The ribbon cutting ceremony was followed by guided tours of the 128,000 square foot teaching and research facility, and guests were treated to previews of the inaugural planetarium show.

The opening events culminated in a community-wide open house on Saturday, March 5th. Over 1,500 guests toured the facility and participated in interactive demonstrations for all ages, including a walk-through solar system, chemistry magic shows and telescope viewing. The Planetarium at UT Arlington opened to the public with six sold-out shows and another appearance by Gen. Stewart. An early evening screening of the movie “October Sky” in conjunction with the Arlington Public Library rounded out the day’s events.
Community Connections: K-12 Outreach

The sixth annual Calculus Bowl brought 90 area high school math students to UT Arlington on February 24th to compete in fast-paced elimination rounds of calculus problem-solving. This event was created and coordinated by Dr. Hristo Kojouharov and Dr. D.L. Hawkins of the Department of Mathematics to encourage student interest in calculus. The event utilized state-of-the-art computer technology to pose questions and track responses. Contestants strived to be the first team to buzz in with the correct answer, and winning teams earned trophies and prizes. Forty-seven schools have participated in the past six years, and this year’s competition brought 18 teams to the campus. Emily Taylor, a senior from Kennedale High School, participated for the first time this year and was thrilled with her rookie team’s fourth place finish. “I wish we had known about this the whole time we were in high school - this is one of the most fun things we’ve done the entire four years!” she exclaimed. Sponsors included Prentice Hall, publisher of the calculus text used in UT Arlington’s calculus courses, as well as the Provost’s Office and the College of Science. To find out more about this event, visit the Math Department website at http://www.uta.edu/math/ or contact Dr. Kojouharov at hristo@uta.edu.

Another event that brought hundreds of aspiring junior and senior high scientists to campus from Houston, Austin, and north Texas schools was the Regional Science Olympiad, hosted by the Honors College, College of Science, and College of Engineering. Fifteen-member teams from five high schools and thirteen junior highs competed in challenging hands-on science and engineering events designed to test their knowledge of a wide range of concepts. Competitions were coordinated by faculty from science, engineering, kinesiology, and music, who developed grade-appropriate activities and challenges for the all-day event. Qualifying teams advanced to the state level after successfully demonstrating their skills in events ranging from trebuchet construction to identification of ecosystems.

On-Campus Conferences

UT Arlington’s Psi Chi chapter hosted a regional conference held at UT Arlington on February 24-25. Morning activities included poster and paper presentation sessions on psychological research. Afternoon sessions featured a keynote address by Dr. Charles Spielberger entitled “The Nature and Assessment of Occupational Stress.” He was the Director of the Center for Research in Behavioral Medicine and Health Psychology at the University of South Florida. The event was sponsored by the National Council of Psi Chi, UT Arlington’s Psychology Department and College of Science. You can learn more by visiting http://www.uta.edu/student_orgs/psichi/convention2005.

The 29th Annual Texas Partial Differential Equations Conference was hosted on campus March 25-26 by the Department of Mathematics at UT Arlington. The purpose of this gathering was to encourage participation of young faculty and graduate students and promote collaboration on research endeavors. Find out more at http://www.uta.edu/math/texaspde/.