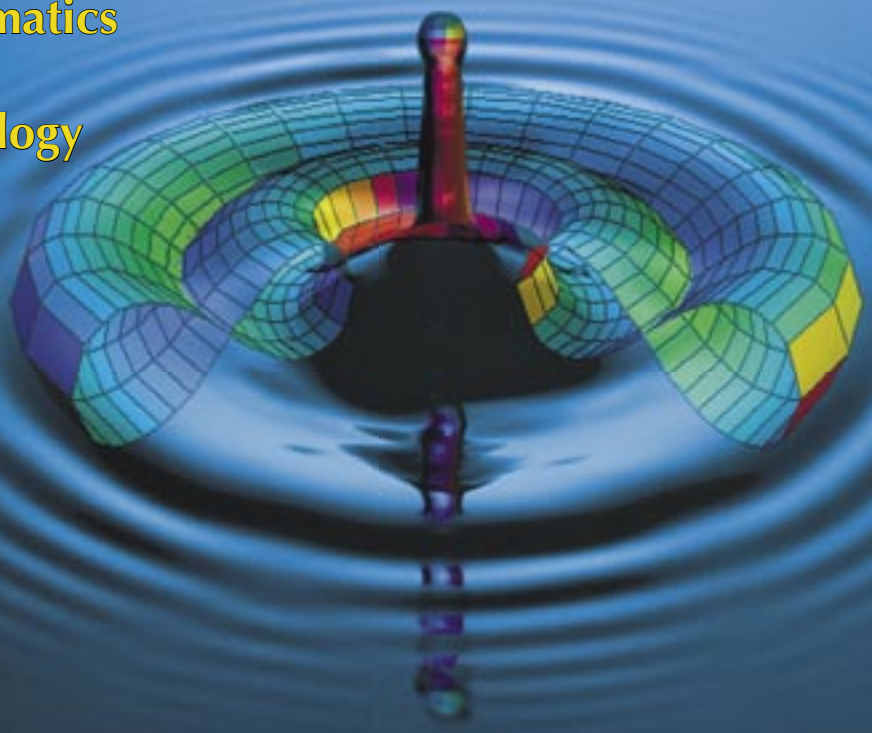
From the College of Sciences

Biannual Vol. 3

SciTech

A Newsletter for Alumni and Friends

Applied Physiology
Biology
CEISMC
Chemistry & Biochemistry
Earth & Atmospheric Sciences
Mathematics
Physics
Psychology



Letter from the Dean

As we begin a new year, the College of Sciences (CoS) is rapidly establishing itself as a nationally recognized, preeminent institution for science, teaching, and research. Our science education stretches far beyond the theoretical, combining basic science with the most sophisticated technology to solve real problems–from research on water pollution, air quality, and global warming to studies aimed at deciphering the genetic code. Both faculty and student researchers in the College of Sciences are transforming scientific understanding into ways of enriching human experience. We are making it possible for students to apply their basic science education in a meaningful way—outside the classroom and in the lab. We are making great strides in other areas:

• Student enrollment in CoS majors for Fall Semester 2004 has increased 30%, compared to Fall 2003. The largest increase, 50%, is in the School of Biology. This increase in total enrollment can be attributed in part to increased and improved recruitment efforts, but also to the heightened visibility of Georgia Tech's academic and research programs.

• Research funding within the college reached an all-time high in FY 2004. New funding increased by 40 percent and new funds received reached $39,557,200.

• Our faculty continue to receive national and international recognition. In this issue, you will read about a number of faculty who have received accolades from their peers. We are also proud to report that the College added eleven new faculty and a new school chair—John McDonald in the School of Biology. We have a short article on him as well.

Nobel Laureate Allan Heeger lecturing to a full house!

• Progress continues on the fourth building (top of column) of Tech's new Biotechnology Campus—the Molecular Science and Engineering Building (M). This building, like the others in the complex, will represent the essence of Tech's innovative multidisciplinary approach to science and engineering. The M building is being designed to foster interactions between scientists and engineers whose research interests intersect in a common area—in this case, materials and the molecular basis of their structures and properties.

Since materials-related research increasingly requires a multidisciplinary approach, the M building will provide the environment and shared laboratory space for over 60 faculty members and their students for this merging of science and engineering. The internal design will maximize the interactions between faculty and students in both offices and laboratories, and the building will be connected to two of the other buildings on the Biotechnology Campus by pedestrian passageways.

The accomplishments represented in the articles in this issue of *SciTech* demonstrate our continued resolve to become the leading institution for science, teaching, and research in the country. I hope you enjoy reading about our efforts toward that goal.

Finally, I would like to personally say good-bye to Blythe Keller, and thank her for her past support in the position of Director of Development. I would also like to welcome the new Director of Development, Philip Bonfiglio. Please do not hesitate to provide me with your questions or feedback. I can be reached at the College of Sciences, 225 North Avenue, Atlanta, GA 30332-0365 or at science@cos.gatech.edu.

Cover Art: Janet Ziebell with **Water Photo by Tim McCabe**, USDA Natural Resources Conservation Service. **Mathematics by Jeffery Elms, Ryan Hynd, Roberto Eduardo López and John McCuran with Professor Evans Harrell** in the School of Mathematics, Georgia Tech, work titled *Classification of rotational figures of equilibrium*.

FACULTY PROFILE

Tech Alumni Remember their Great Teachers at Georgia Tech

From The Classroom, by Donna C. Llewellyn, Ph.D.

A standard exercise given to all of CETL's teaching fellows is to sit back, close your eyes for a few minutes and recall your favorite teacher of all time – anybody from kindergarten to graduate school. They then share these memories – what brought that individual to mind, what made that class so memorable and important. It is always interesting to hear how in some way these good memories follow from the passion of the teacher. This passion is transmitted in a variety of ways – remembering who our students are, driving the students hard to show them that we have high expectations for them and will settle for no less, connecting our research to our lessons in order to link the two passions closer together, illuminating the pathway to the future so that the student can develop the same passion for the material.

Last fall, the Center for the Enhancement of Teaching and Learning (CETL) wrote to a number of alumni asking them to think back on their Georgia Tech days. Specifically, they posed these two questions:
Please think back to your years as a GT student and recall your most memorable professor. Please share your memory – how did this person inspire you, guide you, influence who you are?
In your opinion, what makes a great Georgia Tech professor?

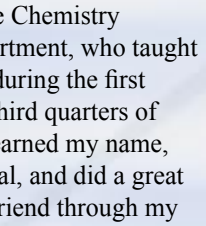
The responses received were enlightening and entertaining!

John Ridley graduated from Georgia Tech in 1935 with a BS in Chemistry. He went on to earn a medical degree and is now retired after being a surgeon. He recalls **D.M. Smith** from the Mathematics Department as "a friendly, inspiring curmudgeon who could scare the hell out of you, teach you, advise you, and follow your future after graduation. … Dr. Smith was unfailingly interested and supportive."

Dr. Ridley also reflects on **George Griffin** "who didn't teach me in a classroom but taught me the value of sincere friendship, loyalty, and support through my Georgia Tech days and in the years afterward."

Aaron Todd received both BS and PhD degrees from Georgia Tech in 1959 and 1964, respectively. He is now a Professor of Chemistry, Emeritus, at Middle Tennessee State University. He remembers **William Spicer**, the chairman of the Chemistry Department, who taught him during the first and third quarters of his freshman year. "He learned my name, treated me as an individual, and did a great job in lecture. He was a friend through my years at Tech, indirectly influenced my decision to be a university professor myself, and served as a primary role model for me as a teacher." Dr. Todd writes that "a great Georgia Tech professor can choose what needs teaching, gets it across to students effectively, and cares about students as individuals."

Erling Grovenstein, Jr. received his BS from GT (1944) after only 3 years; received his PhD in 1948; started teaching at Georgia Tech the same year; was promoted to Associate Professor the following year. Dr. Grovenstein wrote about **John Lawrence Daniel**, a Professor and the head of Chemistry: "Mr. Daniel was not a popular teacher. His smile brought out wrinkles around his mouth that looked a bit like cat whiskers and earned him the nickname of 'Puss Daniel.' He always welcomed me in his office, even after graduation, and gave thoughtful advice sometimes on non-academic problems. He was truly a memorable professor and gentleman." Now the Julius Brown Professor Emeritus of Chemistry, Dr. Grovenstein retired in 1988 having taught here at Georgia Tech for forty years. These many years of teaching experience certainly are evident in his answer to the second question: "What makes a great Georgia Tech professor?" He explains that "there are various types. Mr. Daniel represents one type who, I fear, would receive poor student ratings. At least fellow students did not seem to like him, judged by their comments at the time they were in his class. After graduation, attitudes frequently change, and I think they would for Mr. Daniel. Georgia Tech needs to have great, memorable professors of different types. The world is too complex to standardize on one type of meritorious professor."



Eladio Pereira, the Chief of Medical Staff and Clinical Services at the Mariposa Community Health Center in Nogales, Arizona, writes "I entered Georgia Tech in the fall of 1976 as a youngster from Puerto Rico who wanted to study and perform well. … Three professors made a difference in my life. They were kind, compassionate and intelligent—the same qualities that make a physician truly exceptional. They were **Drs. Drury Caine, James Stanfield** and **Aaron Bertrand**. ... They were inspirational with their devotion to teaching and overall support to students. I have been a fortunate individual all of my life—the reason is that I have encountered individuals who have taken the time to teach me how to become a better person."

Full article available at www.cetl.gatech.edu/resources/classroom/classroomS2004.pdf

Photos furnished by: Georgia Tech Library Archives, the Office of Student Publications and College of Sciences

Awards and Profiles

Awards and Profiles

STUDENT PROFILE

Thomas Callaghan - Barry M. Goldwater Winner

by David Terraso Institute Communications and Public Affairs

Mathematics major and one of the 2004 Barry M. Goldwater Scholarship winners, **Thomas Callaghan's** undergraduate research found simulated monkeys could rank college football teams as well as the BCS ranking system.

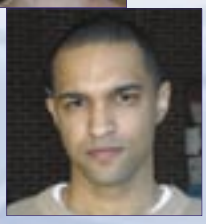
Callaghan has been conducting research with Mathematics Assistant Professor Peter Mucha. The two were puzzled by college football's Bowl Championship Series (BCS) ranking system and wondered if a bunch of simulated monkeys could rank the top teams at least as well as the expert coaches, professional sportswriters and the BCS system. Together with Visiting Assistant Professor Mason Porter, they tested their theory through a mathematical formula and produced results mirroring those of the experts. The project was profiled in media outlets such as Nature, ESPN magazine, and CNN Headline News. Mucha credited Callaghan's initiative and hard work for the project's success.

Callaghan said he's drawn to math because it's the foundation for a wide range of disciplines. "I like knowing why things work. Math is the language of problem solving. All of physics, chemistry, and engineering are based on math."

He plans to continue pursuing undergraduate research next year.

This year the Barry M. Goldwater Scholarship and Excellence in Education Foundation awarded 310 scholarships out of a field of 1,113 applicants from the United States and Puerto Rico. The Scholarship Program, honoring former Arizona Senator Barry M. Goldwater, was designed to foster and encourage outstanding students to pursue careers in the fields of mathematics, the natural sciences and engineering.

Students win - NSF National Pre-doctoral Fellowships



Out of fourteen NSF National Pre-doctoral Fellowships in 2004 awarded to Georgia Tech, three went to graduating GT students, Katherine Filaski, Ryan Hynd, and Kristen Marhaver.

Kristen Marhaver is a co-winner of the School of Biology's Williams Walls Life Science award. Kristen has also won a NSF National Pre-doctoral Fellowship and was voted the best Graduating Biology Major.

Ryan Hynd has been chosen as Best Senior due to his outstanding academic and research performance. He has conducted research in Mathematics and Physics that resulted in research publications in the fields of geometry and partial differential equations. Ryan has won a three year ATT Fellowship and a NSF National Pre-doctoral Fellowship. He will be a UC Berkeley graduate student in mathematics.

Katherine Filaski has won an NSF National Pre-doctoral Fellowship, which offers recognition and three years of support for advanced study to outstanding graduate students for research-based Ph.D. degrees. Katherine graduated last year as a Chemistry Major and is currently a first-year graduate student at UC San Francisco.

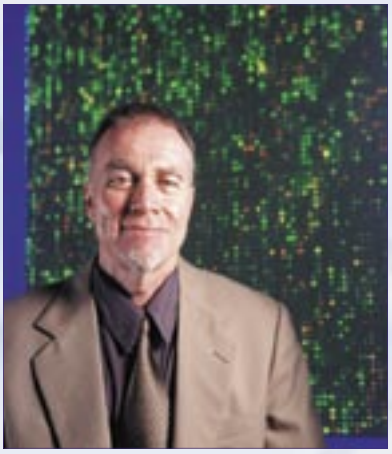
Student wins National Defense Science and Engineering Graduate (NDSEG) Fellowship

School of Chemistry and Biochemistry's **Terry Watt** has been awarded the National Defense Science and Engineering Graduate (NDSEG) Fellowship, administered by the American Society for Engineering Education (ASEE). This prestigious and highly selective award (which includes an attractive package of salary, tuition and additional benefits) is fitting recognition of Terry's successes in the program.

Awards and Profiles

New College of Sciences School of Biology Chair

After fourteen years as Chair of the School of Biology, Dr. Roger Wartell returned to the life of a full time academic faculty member. All reports indicate that he is enjoying his new role!



Fortunately for the School, **Dr. John McDonald**, formerly Head of the Genetics Department at the University of Georgia and former acting Director of the Institute of Bioinformatics at UGA, assumed the position of Chair of the School of Biology in July. Dr. McDonald is Chief Scientific Officer of the Ovarian Cancer Institute (OCI), based in Atlanta and is author of over 100 scientific publications and the successful introductory genetics text, *The Science of Genetics*, published by Harcourt & Brace (New York). Dr. McDonald is editor of three texts on viral-like elements. His research is funded by the NIH and has been highlighted in many popular publications and newspapers including *Discover* Magazine, *Science News*, *The San Francisco Chronicle* and the *Atlanta Journal Constitution.* He is a recipient of the Georgia Cancer Coalition 2004 Cancer Research Fund Award. Dr. McDonald is the former Editor-in-Chief of *Genetica: the International Journal of Genetics* and is current editor of the *Georgia Genetics Review*.

In addition to being a hardworking administrator, Dr. McDonald is also a dedicated researcher and scientist. His laboratory has two areas of research focus: genome evolution and cancer genetics. Genome evolution studies focus on the contribution of retrotransposons (retroviral-like elements that comprise more than 50% of the human genome) to the evolution of eukaryotic genome structure and function.

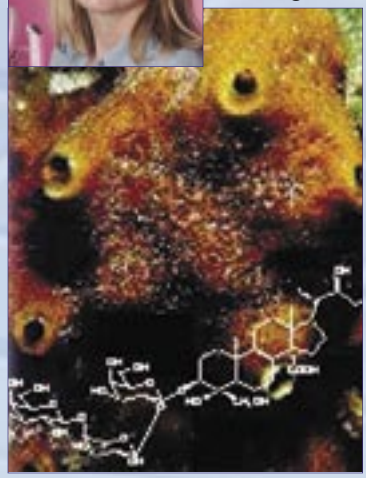
Cancer genetic research is centered around efforts to develop molecular methods to objectively classify and diagnose human ovarian cancer. The Ovarian Cancer Institute, was established by the noted Atlanta cancer surgeon, Dr. Benedict Benigno, in 1999. Scientists and bioinformaticists work in collaboration with ovarian cancer surgeons in Atlanta and gynecologists throughout the State of Georgia. Dr. McDonald was recruited to direct the research arm of the Institute in 2002.

Georgia Tech welcomes Dr. McDonald from "that other state university" and looks forward to his direction of the School of Biology.

Photo by: Paul Efland, University of Georgia

NSF CAREER Awards

Assistant Professor Julia Kubanek, in the School of Biology and the School of Chemistry and Biochemistry, was presented with a 2002 Presidential Early Career Award for Scientists and Engineers (PECASE). Kubanek was nominated by the National Science Foundation (NSF), which funds her research in aquatic chemical ecology with a NSF Faculty Early Career Development (CAREER) award in the School of Biology.



Assistant Professor Marion Sewer, in the School of Biology, was awarded a National Science Foundation CAREER Award. Her research interests center on regulation of gene expression, cell signaling and signal transduction, steroid hormone biosynthesis, cytochrome P450 gene transcription and metabolism, receptor signaling, function and development of the endocrine system.

Assistant Professor Athanasios Nenes from the School of Earth and Atmospheric Sciences and the School of Chemical and Biomolecular Engineering has received a NSF CAREER AWARD and a NASA New Investigator Award. The NASA program encourages scientists and engineers to develop a broader sense of responsibility for effectively contributing to the improvement of science education and public science literacy.

Faculty and School Updates

SCHOOL PROFILE

Center for Education Integrating Science, Mathematics and Computing at its Best

by Paul Ohme

CEISMC (Center for Education Integrating Science, Mathematics and Computing) has a mission: to leverage Georgia Tech's resources to improve math, science and technology at the K-12 level for all students in the state of Georgia. In addition, CEISMC actively encourages success for underrepresented and underserved populations, i.e. females and/or minorities. CEISMC's success in this mission has been astounding.

Over the years CEISMC has developed an array of programs designed to meet the interests and needs of students and teachers. These programs include:

- Learning camps - Saturday and summer camps for students based in part on the research of Georgia Tech faculty,
- Georgia Industrial Fellowship for Teachers (GIFT)—a program that coordinates paid internships for 6th through 12th grade teachers in research and corporate settings,
- Professional Development—middle and high school science, mathematics and technology teachers participate in short-term workshop experiences that emphasize content and diversity issues,
- Mentoring/tutoring—each semester over 100 Georgia Tech students serve as mentors/tutors for K-12 students.

Two years ago, with the support of the Arthur M. Blank Family Foundation and the GE Foundation, CEISMC developed a partnership with the City Schools of Decatur and designed the Mentoring for Success program. This program, which combines all CEISMC programs, began with a group of 32 sixth grade students and 20 ninth grade students in 2002—comparable groups were added in 2003 and will be added in 2004. By 2004, CEISMC will have a group in each grade, 6th through 11th, representing 10-12% of each class. Participating students are nurtured in science and mathematic skills to encourage them to take higher level high school mathematics and science courses. College students from Georgia Tech and other metro campuses are selected as mentors and each is matched with two student mentees. The mentor assists the teachers with lab experiments during regular class periods, engages in social activities with their mentees (frequently on the Tech campus), and offers tutoring/mentoring regularly via e-mail. Each student mentee in the program is encouraged to attend at least one program at Georgia Tech each summer.

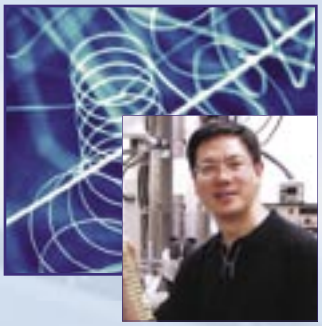
Another aspect of Mentoring for Success involves teachers from the middle and high schools in Decatur who participate in the GIFT program and in short term seminars discussing techniques of inclusive teaching practices. These seminars target students, typically African American and/or females, who were not projected to go into careers in the quantitative disciplines. Teachers and administrators from the school district identify students who have demonstrated an interest and some aptitude for science and mathematics as potential program participants. City Schools of Decatur teachers enhance their knowledge and ability to stimulate students' interest in furthering their education—and their ability to create a truly equitable learning environment. CEISMC has learned that two advantages of partnering with a school district are: 1) the districts hold the data needed for program assessment, and 2) over time, the school district will be able to judge the impact of Tech's efforts on its teaching force, the student groups, and students not in selected groups.

So far, empirical data from surveys and interviews with student and teacher participants indicate that CEISMC's Mentoring for Success is positively impacting its targeted audience. As the program proceeds and long-term data are acquired, programs will be adjusted to accommodate the most current findings.

Interestingly, current national data indicate that females and minorities still enter careers in the quantitative fields in disproportionately low numbers. Thus a program such as Mentoring for Success —with its multiple mechanisms which, when employed over several years, have proven to enhance student knowledge and skills, provide motivation and support, and monitor and advise students—is a valuable and much needed tool to aid in increasing

the success rates of minority students in these fields. Building on lessons learned in this pilot phase, CEISMC is now planning to implement a similar program in a school district 20 times the size of Decatur. With CEISMC's track record, there is no doubt another success story will be coming soon!

FACULTY UPDATES



Professor Zhong Lin 'ZL' Wang Director of the Center for Nanoscience and Nanotechnology; and Director of Electron Microscopy Center, from the School of Materials Science and Engineering, and adjunct appointment in the School of Chemistry and Biochemistry was named a Georgia Tech Regents' Professor. Regents' Professors are recognized on the Tech campus as intellectual and educational leaders of the highest order.

UNDERGRADUATE RESEARCH UPDATE

The loblolly pine NSF Plant Genome Project is the focus of an effort by Georgia Tech **Associate Professor John Cairney** and Clayton College & State University researchers to map its DNA profile in search of genes important in its growth from a plant embryo to a seedling. Cairney has enlisted Clayton State's Greg Hampikian and Jacqueline Jordan and their biology students in completing the genetic sequencing portion of the research.

"We're giving students in the class the opportunity to discover new genes involved in plant embryogenesis," said Hampikian, a Clayton State associate professor of biology and a forensic science expert. "This is really cutting-edge research and as far away as you can get from a canned lab experiment."

As part of this ongoing collaboration between Georgia Tech and CCSU, undergraduate students from Dr. Hampikian's class have been working in Dr. Cairney's lab. Ms. Brande Jones worked with Dr. Cairney while finishing her degree and graduated CCSU last year. She has now been accepted into the MS program in Biology at Georgia Tech. Another student, Ms. La'Keshia Hayes, is currently working in Dr. Cairney's lab.

The project serves as an outreach program for college undergraduates. Eventually, it will involve high school students and teachers.

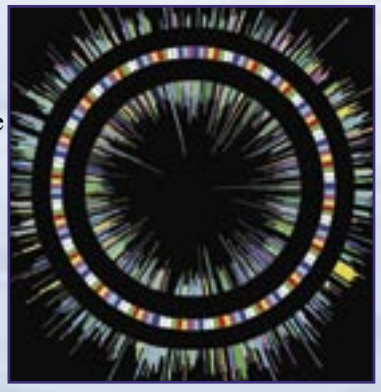
New Multi-Disciplinary Doctoral Program in Bioinformatics

by Andy Smith Associate Dean in the College of Sciences

Under the leadership of **Regents' Professor Mark Borodovsky**, in the School of Biology, Georgia Tech has a new multi-disciplinary doctoral degree in Bioinformatics.

Bioinformatics is a new field that integrates mathematical and computational methods to analyze large biological, biochemical, and biomedical datasets. For example, genomic-based approaches to drug design are now the research focus of pharmaceutical and biotechnological companies. Well-trained computational research scientists are needed to conduct this biomedical research. Bioinformatics at Georgia Tech also has strengths in the development of software tools and algorithms for gene identification and protein structure prediction.

Doctoral students in the new program can apply through a number of Schools cutting across three colleges at Georgia Tech, including Biology, Chemistry and Biochemistry, and Mathematics from the College of Sciences; Biomedical Engineering, Electrical and Computer Engineering, and Industrial and Systems Engineering from the College of Engineering; and Computer Science in the College of Computing. Students share a core curriculum in Bioinformatics and Computational Bioscience, but the curriculum is flexible enough to meet the needs of students entering from a variety of different scientific and engineering backgrounds. The program was approved in the summer of 2003 with the first students entering the program during the 2003-2004 academic year.



The new program recognizes that there is also a strong need for doctoral-level research scientists to advance the field through discovery, innovation, and scholarship. Graduates from the new doctoral program will also provide academicians to train and mentor future generations of scientists in this new field.

Faculty and School Updates

FACULTY UPDATES

Assistant Professor Harish Radhakrishna in the School of Biology has been awarded a Junior Faculty Teaching Award by Georgia Tech's Center for the Enhancement of Teaching and Learning. This award recognizes Harish's contributions to undergraduate instruction at Georgia Tech.

Associate Professor Patricia Sobecky has received the Nelson and Bennie Abell Professorship in Biology. This award is given to a junior faculty member who has demonstrated exceptional creativity and scholarship and has a clear potential for an outstanding academic career. The professorship is given for three consecutive years to enhance the faculty member's research program.

Associate Professor Andrew Lyon in the School of Chemistry and Biochemistry received the Camille Dreyfus Teacher-Scholar Award. The Camille and Henry Dreyfus Teacher-Scholar Awards Program was established to strengthen the teaching and research careers of talented young faculty in the chemical sciences. Recipients of the award are selected primarily based on individual research attainment and promise, along with evidence of excellence in teaching.

Professor Seth Marder was elected Fellow of the American Association for the Advancement of Science-2003 and was elected a Fellow of the Optical Society of America 2004.

Professor Thomas Orlando, Chair of our School of Chemistry and Biochemistry and Adjunct Professor of Physics was elected as a fellow of the American Association for the Advancement of Science. Fellows are recognized for meritorious efforts to advance science or its applications.

Associate Professor Art Ragauskas was elected Fellow of the Technical Association of the Pulp and Paper Industry. His research interests have included bleaching chemistry, chemo–enzymatic fiber modification, and photo–yellowing of high lignin content wood pulps.

School of Earth and Atmospheric Sciences Chair and **Professor Judy Curry** was elected a Fellow of the American Geophysical Union. Her research interests include dynamics of weather and climate, chemical and paleo-oceanography, atmospheric chemistry, and aerosols and clouds.

Professor Emeritus Doug Davis was named on the Institute for Scientific Information (ISI) list of highly cited geoscientists. The selection of a researcher is based on the total number of citations received by that individual within a given category.

Professor Robert Dickinson was also named on the ISI list of the most highly cited researchers of our time—the top influential researchers from 21 broad subject categories in life sciences, medicine, physical sciences, engineering, and social sciences who have contributed to the progress of science through their insight and accomplishments.

Professor Michael Lacey in the School of Mathematics has been selected for a Guggenheim Fellowship for 2004. This prestigious award is made to distinguished scholars across a broad range of fields. In 2003, the Foundation made 184 awards in the U.S. competition, and 5 of these went to mathematicians.

Assistant Professor Peter Mucha was awarded a Department of Energy Early Career Investigator Award. This is the 3rd year of this program, which has a profile very similar to the much better known CAREER grants. It is a competitively awarded grant; this is the first to have gone to a GT professor.

Faculty and School Updates

Regents' and Institute Professor Uzi Landman in the School of Physics received the 2004 Georgia Tech Outstanding Achievement in Research Program Development Award, awarded to the faculty member who made the most outstanding contributions to research program development. The award takes into account the potential for enhancing Georgia Tech's long-term scholarly reputation.

Associate Professor Richard Catrambone in the School of Psychology was awarded the Georgia Tech Class of 1940 W. Howard Ector Outstanding Teacher Award. The award is given for extraordinary efforts in teaching, inspiration transmitted to students, direct impact and involvement with students, intellectual integrity and scholarship, and impact on postgraduate success of students.

Professor Dan Fisk, School of Psychology has received the 2004 Georgia Tech Outstanding Doctoral Thesis Advisor Award and was awarded the Paul M. Fitts Education Award for outstanding education and training of future human factors and ergonomics specialists. Dan was also elected Secretary-Treasure of the Human Factors and Ergonomics Society.

Professor Jack Marr, School of Psychology has been selected by the Executive Council of the Association for Behavior Analysis International as one of the five founding Fellows of the Association (selected from a full membership greater than 4000) on the basis of outstanding contributions to behavior analysis.

Researchers Return to Antarctica in Pursuit of Elusive Scientific Mystery

by Sean Selman — Institute of Communication and Public Affairs

"Antarctica is a land of mystery. We're going to be probing some fundamental questions posed by science about the region," said **Professor Emeritus Doug Davis**, Antarctic Tropospheric Chemistry Investigation (ANTCI) mission scientist and the project's co-principal investigator, along with Principal Research Scientist Fred Eisele, both from Georgia Tech's School of Earth and Atmospheric Sciences.

"In fact, we're rewriting the book on atmospheric chemistry in Antarctica," Davis said. "The data we're collecting down there is changing our whole view of what's happening in the atmosphere and why."

The broad goal of ANTCI is to gain a better understanding of the air above Antarctica. This includes measuring two major chemical families in the atmosphere and in the local environment—sulfur and nitrogen—and the oxidizing agents that affect their levels. Scientists also plan to measure the levels of several other trace gases that affect atmospheric chemistry.

"Analyses of ice cores from the Antarctic glaciers are among the most important pieces of information we have for understanding past climates," said Professor Judy Curry, chair of the School of Earth and Atmospheric Sciences. "Georgia Tech's major role in ANTCI reflects the strengths and unique capabilities of our atmospheric chemistry program."

"The chemistry of the atmosphere is what interests us," said Associate Professor Dave Tan, another member of the scientific expedition going to Antarctica this fall. "Ultimately, atmospheric chemistry relates to climate, which affects us all. Previously, we thought that the Antarctic atmosphere was inert, but it turns out, it's not."

Full story at http://www.gatech.edu/news-room/release

Faculty and School Updates

SCHOOL UPDATES

BIOLOGY

In November Professor Mark Hay of the School of Biology led a six-person team of scientists to the undersea laboratory Aquarius. The Aquarius is owned by the National Oceanic and Atmospheric Administration (NOAA) in the Florida Keys.

The mission began the researchers' two-year investigation on how grazers, specifically parrotfish and surgeonfish, affect seaweeds and corals in the Florida Keys National Marine Sanctuary. Using Aquarius, a 47-foot cylindrical lab, gave the researchers an ideal platform from which to set up their experiments and make observations.

Aquarius is a one-of-a-kind underwater ocean laboratory deployed three-and-a-half miles offshore, at a depth of 60 feet, next to spectacular coral reefs. Scientists live in Aquarius during 10-day missions using saturation diving to study the ocean.

Aquarius is operated by the National Undersea Research Center (NURC) at the University of North Carolina at Wilmington.

Excerpts from the journals Professor Hay and his team members kept during the mission can be found at http://gtresearchnews.gatech.edu/reshor/rh-w04/fac-column.html

CEISMC

Dr. Paul Ohme, Director of CEISMC, provided testimony for members of the President's Commission on Moon, Mars, and Beyond, on March 24, 2004. He spoke on the characteristics of effective science outreach programs and described for the commission a partnership that is currently underway involving the State Department of Education, Georgia Tech's College of Computing, and other corporate partners.

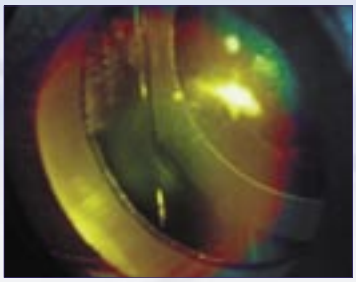
CHEMISTRY/BIOCHEMISTRY

School of Chemistry and Biochemistry has a growing reputation reflected in its enrollment and faculty. The School now ranks as the 12th largest program in the country with 218 graduate students and, in 2003-2004, fifty-five first-year students and six new faculty. Thom Orlando as Chair of the School said, "the students are the most important reason that the school exists, and their presence and efforts are what fuels the science we are all engaged in."

PHYSICS

Physicist Alex Kuzmich and his colleagues at the Georgia Institute of Technology are developing more accurate atomic clocks with his research on quantum entanglement.

Kuzmich has studied quantum entanglement for the last 10 years and has recently turned to exploring how it can be applied to atomic clocks.



An astonishing property of quantum mechanics called "entanglement" will improve atomic clocks—humanity's most precise way to measure time. Entangled clocks could be as much as 1000 times more stable than their non-entangled counterparts.

"Entangling the atoms in an atomic clock reduces the inherent uncertainties in the system," Alex Kuzmich explains. "The ability to measure time with very high precision is an invaluable tool for scientific research and for technology," says Kuzmich. NASA uses atomic clocks for spacecraft navigation. Geologists use them to monitor continental drift and the slowly changing spin of our planet. Physicists use them to check theories of gravity. An entangled atomic clock might help test the value of the Fine Structure Constant, one of the fundamental constants of physics. The research is still at the stage of just demonstrating the principle. Building a working prototype is probably several years away.

Faculty and School Updates

Teaching high school students a new respect for math

by David Terraso Institute Communications and Public Affairs

Math is a four-letter word. Intimidated by its perceived complexity or convinced that the subject has no relevance outside the classroom, many students shun math for more literary pursuits. But the universal language is everywhere. The world economy is built on math. From the computing revolution, to advances in medicine and space exploration, to shopping over the Internet, nearly all the major advancements of this and the past century have their foundations in math. Yet despite the subject's pervasiveness, many students and parents continue to fear math.

Georgia Tech is working to change that perception through educational outreach programs and a new math competition. Earlier this year, the School of Mathematics held its first high school mathematics competition in nearly 50 years. The goal is to attract both students who are experienced in mathematics competitions, as well as those with untapped talent.

"Math opens doors to almost every discipline," said Math Professor Yang Wang. "It teaches students analytical abilities that are valued in a number of non-math professions."

Tech alumna Mary Beth Young, who received a master's degree in mathematics, said that studying math has helped her tremendously in her law practice and during her stint as a law clerk for U.S. Supreme Court Justice Antonin Scalia.

"Math accustoms you to rigorous thinking and following through the implications of an argument. It helps you identify logical problems, which is useful in law and many other disciplines," she said.

Tech used the competition as a recruiting event with activities for both students and parents. Approximately 250 high school students from Georgia and neighboring states participated in a competition that consisted of two hour-long tests followed by fun activities centered on math. While the students were busy with the exams, parents and teachers listened to presentations from Tech's admissions counselors and mathematics professors. During the afternoon, students, parents, and teachers toured the campus.

"There's a lot of talent that can be cultivated," said Wang. "The competition is one way we're hoping to do that."

Graduate students, such as Gail Rosen, are another way. Rosen is a fellow in Georgia Tech's Student and Teacher Enhancement Partnership program (STEP). She spends several days a week teaching trigonometry, pre-calculus, and physics at Tri-Cities High School, a visual and performing arts magnet school in Fulton County.

"A lot of students will say they don't like math, but I think they don't realize how important it is," said Rosen. "Even the honors students don't all understand why they need to know math." Rosen said she's been teaching her students how math comes up in everyday life—from simple things such as calculating credit card interest to creating music, a topic that hits home at the magnet school.

IN MEMORIAM

Thomas W. Kethley

Professor Thomas W. Kethley, 90, Professor Emeritus in the School of Biology, was a teacher and administrator during his 34-year career at Georgia Tech. His attention was focused on bioengineering research—with practical applications. During the 1950's, he worked as a research assistant and associate professor at the Georgia Tech Engineering Experiment Station, doing research relevant to the frozen foods industry. He worked on processes to improve the taste of a 1950s innovation—frozen food. His research focused on orange juice, shrimp, and strawberries.

In the 1970s as a Professor in the School of Biology, he set out to find ways to keep hospital operating rooms as free from bacterial contamination as possible. Professor Kethley worked for nine years together with his co-worker, W. B. Cown (Crown), to design an air-filtering system to combat germs in hospital operating rooms by removing bacteria from the air, pumping out the old air and germs, and then pumping in sterile air. The pumps provided 20-30 complete changes of air in an hour.

Ernest L. Pollitzer, Ph.D. Chem '51

I am Ernie Pollitzer Jr. (CE'92) and am writing to let my Dad's friends and associates know of his passing on December 17, 2003. My dad has been fighting cancer for the past 1 1/2 years. He passed at his house in Milledgeville, Georgia, with his family, which was his wish.

Dr. Pollitzer was born in Manchuria, China, and had lived in Milledgeville for the past eighteen years, having previously lived in Chicago. He was the son of the late Robert Pollitzer and Helen Kutusov Pollitzer. A graduate of Georgia Tech with a Ph.D. in chemistry, Dr. Pollitzer was a chemist for UOP, Inc.

Dr. Pollitzer is survived by his wife: Elizabeth Pollitzer of Milledgeville; sons: Ernest Pollitzer, Jr. of Marietta, Robert Pollitzer of Little Rock, Arkansas; daughter: Elizabeth Pollitzer of Hot Springs, Arkansas; and by five grandchildren.

He asked that donations be given to the Georgia Tech Foundation.

DEVELOPMENT AND ALUMNI

Board Member PROFILE

Dr. David O. Ellis

General Partner of EGL Ventures

Dr. David O. Ellis, a College of Sciences Advisory Board member, has been an influential, powerful, and effective force behind every endeavor he has undertaken. David was born in the United Kingdom; he received a British Petroleum Scholarship to the University of St. Andrews, where he earned an Honors degree in Chemistry in 1964, followed by a Ph.D. in Biophysics in 1967. After graduating, he joined 3i Group PLC, one of the largest private equity managing companies in the world. From his original position as Management Trainee, David progressed through the Technology Investment arm (Technical Development Capital Limited) and Regional Management network. After attending the Senior Executive Program at the Sloan School of MIT, Dr. Ellis was selected to found and lead the team responsible for 3i's technology investments and turnaround investments, where he had oversight of over 100 private equity investments.

In 1982, David acquired Corporate Finance Associates of Georgia (CFA), a middle-market investment banking group focused on European companies expanding into the U.S. One of his major successes was the introduction of super-conducting magnet technology into the U.S. for what became the MRI industry.

From the left is David Ellis, Sal Massaro and Stephen Fleming

In 1988, David and Sal Massaro launched EGL, a venture capital and private equity business. Based on David's relationships in British finance circles, he raised capital for U.S. venture investments. EGL invested in a range of sectors, including information technology, healthcare, instrumentation, manufacturing, and distribution businesses at all stages of development.

In May 1997, David was in a serious automobile accident. He has recovered, but must use a wheelchair. David has turned this difficult experience into a positive for his life and for EGL. "The accident has influenced my overriding observation—that I am much more emotionally attached to life's experiences than previously. We all know how much we depend on our family and friends for encouragement, nurturing, independent perspectives, and ensuring balance in our lives. After an accident such as mine, this becomes very real and cherished on a daily basis. I am thankful for my wife of 30 years. At the time of my accident, I did not know that our vows 'in sickness or in health' would apply to something as severe as my paralysis. She has born the brunt of the challenge of my recovery without complaint and without rest. I believe this continues to amaze both me and my closest friends."

David's two daughters are Tech alumni. This has enhanced his interest in Tech and has provided practical insights for his role on the College of Sciences Advisory Board (CoSAB). "Clearly, the WOW effect is pleasing to any father to have two grads in the family. Surprisingly, there are some real differences of perception between the professors and the students. My single biggest interest is ensuring that there is more dialogue with local industry regarding the quality of Tech graduates/post-graduates in the biological sciences in order to facilitate job opportunities to match the investment in faculty/buildings/equipment made by Tech in recent years."

As a member of CoSAB, he is pleased that there is a good forum for interaction between academia and the business world. "It has given me a good opportunity to get a real 'feel' for the strength of the College of Sciences (CoS) team and its focus of activities. However, above all I've enjoyed working with the Dean and his vision, which has been inspiring, educational, and challenging. It has refreshed my aging brain cells and motivated me to seek collaboration between the College, my investment interests, and the activities of other institutions in the Atlanta area." David also serves on the advisory boards of the Shepherd Center and two Rehabilitation Engineering Research Centers.

David's adoption of assistive technologies such as an advanced electric wheelchair and voice-recognition software ensure that he is fully engaged in the business and is completely capable of serving as one of the Principals of EGL IV and beyond. His determination is unparalleled, and he is an inspiration to all who know him. In the words of one of EGL's portfolio CEOs, "David has used his wisdom, with which God has amply endowed him, and his unflagging persistence in the face of unbelievable adversity to rebuild his persona to the point that he is much sought after for help in making things happen that ordinary mortals cannot. He's great at that!"

CLASSNOTES

Development and Alumni

1970s

Dr. John W. Verbicky, CHEM '78; has been appointed President and CEO of Envirokare in Orlando Florida. John earned his Ph.D. in Physical Organic Chemistry, holds 26 US patents and is a member of the American Chemical Society, the EPA Science Advisory Board, and the Society of Plastics Engineers. He is also a past student of Vice Provost for Research and Dean of Graduate Studies, Dr. Charles Liotta.

1980s

Warren T. Jackson, Ph.D. (BSAP'88) recently achieved board certification in clinical neuropsychology through the American Board of Professional Psychology. He is currently an Assistant Professor at the University of Alabama in Birmingham, Department of Psychiatry and Behavioral Neurobiology, serving as Director of the Psychology School since 2001. He and his wife, Sheryl, have three children: Caden (7), Conor (4), and Rainey (2).

1990s

Jim Small, BS Chem '91, and his wife Lynnette write to tell us that Jim is in Tulane Medical School in New Orleans on his USAF Scholarship as a 2nd Lt. in the USAF Reserves.

Kenneth M. Starks, MS Chemistry '94 writes that he got married to the former Dawn Wynter on December 21, 2003 in front of the Main Library on Georgia Tech's campus. Judge Chandler Bridges resided over the three-person ceremony. "The Techies who were on campus that day mostly ignored us; most of the students were of course home for the Christmas break. My wife and I didn't take any photographs that day. I do, however, remember that there was a broken water main on campus. I remember the jackhammer being proud and steady. We got our vows in edgeways."

Roberto Villanueva MD, Chem. '96 writes: "After graduating from Tech in '96, I went to, and graduated from the Medical College of Georgia with a degree in Medicine (MD in 2000). After that, I did a Residency in Internal Medicine with the University of Tennessee. This was done in Chattanooga, Tennessee. During that time, I married my current wife, Renee, and have been happily married ever since. After completing my training, I started working in private practice in Gainesville, Ga. I have been adjusting to my new life and enjoying it ever since.
I am somewhat sad to hear of the retirement of Dr. Moran. He was a great mentor to me whom I worked with while at Tech. He also helped me considerably in my career path. He was a great teacher and leader and Tech will miss him (as will I)."

From **Evan Brody**, Bio '96, DPM, "I joined Village Podiatry Group on August 1, 2003 as an Associate Podiatrist. My wife of 10 years, Jennifer, and I are going to celebrate the birth of our third child, due July 5, 2004. Jacob (4) and Lily (2) are the eldest. The family resides in Marietta, Georgia."

Mindy (Brown) Gentry, Bio '96 writes: "I graduated from Medical College of Georgia in 2000. I was selected as Chief Medical Resident for 2003-04 after completing Internal Medicine Residency in June 2003. I will start a Cardiology Fellowship in July. I married Chris Gentry (ChE '96) and we had a daughter in November 2002, Allison."

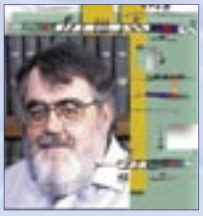
Rebecca Woo, Bio '96, and Daniel Floyd, ChE '97, were married May 25, 2004 in Augusta, Ga. Rebecca is a first-year obstetrics and gynecology resident at Baylor University Hospital in Houston, and Dan is a senior engineer with the Dow Chemical Company.

2000

Jennifer Barton Burch, Bio '98, and Charlie Burch, IE '98, announce the birth of their first child, Caitlin Ann Burch born on Feb 26, 2003.

TECH TRANSITIONS

Retired as of June 2004



Biology
Dwight H. Hall

Mathematics
Theodore P. Hill

Mathematics
Nathaniel Chafee

Development and Alumni

GT Parents Celebrate Chemist Matlock Rogers

Young chemist **Matlock Rogers**, from Crabapple Middle School in Fulton County, took his curiosity one step further. He performed an experiment to evaluate the accuracy of advertised DEET concentrations of commercial insect repellants using FTIR Laser Spectroscopy. Dr. Mostafa El-Sayed, Director of the Georgia Tech Laser Dynamics Lab in our School of Chemistry and Biochemistry, arranged for Matlock's special access to the lab; Graduate Student Susan Eustis supervised him as he conducted the experiment; and Dr. Kimothy Jarrett, principal of Crabapple Middle School, supported his desire to conduct the experiment at Georgia Tech. Matlock's analysis of the research data and scientific method won First Place at his local school and the Fulton County Science Fair. Now he progresses to the Discovery Channel's "Challenge" Program which is equivalent to the national science fair for high school, but is just for middle school students. Matlock is the son of Tech grads Ed (BIE 82 MSIL 02) and Jeanette (Raines) Rogers (BChe 83) and grandson of Georgia Tech Alumni (IE '56) and ISyE Professor Emeritus Dr. and Mrs. Nelson K. Rogers.

RECENT CoS GIFTS

INVESCO and Georgia Tech's School of Mathematics–Southeast Competition

Volunteers played an important role in helping to insure that scholarship awards, given at the School of Mathematics High School mathematics competition were adequately funded. Through the efforts of members of the college's Alumni Steering Committee, the competition was able to secure that funding. Committee member, **Frank Cullen** (BS Math '73, MS Operations Research) was instrumental in introducing the College to the staff of INVESCO—through Frank's neighbor, who works for INVESCO and was very intrigued in the idea of math competitions. Luckily for the competition, the CEO of INVESCO, **John Rogers**, became interested in the event and met with Dean Gary Schuster and Mathematics Professor Yang Wang. During this meeting, both Schuster and Wang were insistent in their desire that this not be just a math competition, but an event that would highlight mathematics and science throughout the southeast. Mr. Rogers and INVESCO were so favorably impressed that they donated $20,000 to fund the scholarship awards for the competition.

Craig and Joy Guidry Lentzsch, Math 1970, have committed $50,000 to establish the Craig and Joy Guidry Lentzsch Endowment Fund in the School of Applied Physiology. The fund will support the school's recently established Prosthetics and Orthotics Program.

General Electric Company Research and Development Center gave $45,000 to Dr.Mei-Yin Chou's thermodynamic research fund in the School of Physics.

Siemens' Foundation made a gift of $45,000 to support the CEISMC program's Siemens Westinghouse Science and Technology Competition.

The Southern Company made an additional gift of $200,000 designated to The Southern Company Air Quality Research Fund in the School of Earth and Atmospheric Sciences.

Georgia Power Company gave $62,000 to support the research of Dr. Yuhang Wang in the School of Earth and Atmospheric Sciences.

The Vasser Woolley Foundation, made a gift of $40,000 for the School of Chemistry and Biochemistry's Vasser Woolley Chair.

Development and Alumni

How to GIVE

DID YOU KNOW that you may designate your contributions for any purpose of your choosing? Many of our alumni, friends, corporations, and foundations have taken advantage of this opportunity to support funding needs within the Schools in the College of Sciences (Applied Physiology, Biology, Chemistry & Biochemistry, Earth & Atmospheric Sciences, Mathematics, Physics, Psychology, CEISMC) such as:

Unrestricted support
Scholarships
Fellowships/Professorships
Chairs
Programmatic needs
Facilities

There are many types of gift vehicles to consider in accomplishing your personal philanthropic goals:

Outright gift (cash, stocks, bonds, real estate, personal property, gifts-in-kind)
Pledge (a gift made over a specified period of time)
Deferred/Planned Gift (cash, stocks, bonds, real estate, tangible personal property, gifts-in-kind)
Will Bequest
Corporate Gift (made to the College of Sciences)

If you have not yet made a gift to the College of Sciences but would like to do so, please make your check payable to the Georgia Tech Foundation, and mail it to the address below. If you have questions or would like more information, please contact:

Philip Bonfiglio
Director of Development
College of Sciences
Georgia Institute of Technology
Atlanta, GA 30332-0365
Direct Line: 404-894-3300
Fax: 404-894-7466

Let us hear from you!

Alumni Classnotes Information Needed

❒ Married? ❒ New Job? ❒ New Baby?
❒ Promoted? ❒ Take a Trip? ❒ See a Classmate?
❒ Moved? ❒ Back in School? ❒ Other?

Details: _____

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Name: _____
Degree: _____
Class: _____
Address (New?) _____

Please return this form along with a photo (optional) to: SciTech Editor, College of Sciences, Office of the Dean, 225 North Avenue, Room 202, Atlanta, GA 30332-0365; or fax information to (404) 894-7466; or e-mail information to: janet.ziebell@cos.gatech.edu. The next deadline for Classnotes submissions is October 15, 2004 for the Winter 2004 Issue. We reserve the right to edit Classnotes for length and style.

2004-2005 EVENTS

Friday, October 1, 2004	*4:00 p.m. Georgia Tech Family Weekend,* College of Sciences Reception at the Parker H. Petit Biotechnology Building
Friday October 15, 2004	*8:00 a.m. CoSAB Meeting* Global Learning Conference Center 3rd Floor, Room 323/324 at Georgia Tech Hotel and Conference Center
Saturday April 16, 2005	*8:00 a.m. CoSAB Meeting* Georgia Tech Hotel and Conference Center in Conference Room A
	11:30 a.m. College of Sciences Recognition Luncheon Georgia Tech Hotel and Conference Center in Salons 4, 5 and 6

Georgia Tech College of Sciences

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