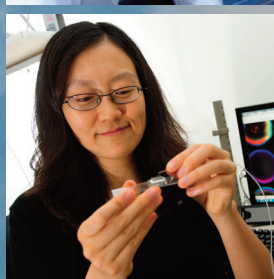


ChBEnews

SCHOOL OF CHEMICAL & BIOMOLECULAR ENGINEERING
AT THE GEORGIA INSTITUTE OF TECHNOLOGY



How Chemical Engineers *improve your life*

Our researchers are developing
new treatment methods for
diseases and novel techniques
for meeting the energy and
sustainability needs for a
healthy environment.

ChBEnews

SCHOOL OF CHEMICAL & BIOMOLECULAR ENGINEERING
AT THE GEORGIA INSTITUTE OF TECHNOLOGY

IT'S NEVER TOO EARLY TO TRAIN FUTURE ENGINEERS!

Georgia Tech's Center for Education Integrating Science, Mathematics, and Computing (CEISMC) sponsors numerous programs that introduce science and engineering concepts to the elementary school curriculum. Sometimes, professors perform impromptu demonstrations as well. Recently, Dr. **Mark Prausnitz** showed a kindergarten class at Mary Lin Elementary School in Atlanta how to mix liquids in test tubes.

IN THIS ISSUE

4 DR. STANCELL SELECTED BY PRESIDENT OBAMA

The U.S. Senate confirms emeritus professor Dr. Arnold Stancell's appointment to the National Science Board

5 BETTER THAN ZERO

Georgia Tech's new Carbon-Neutral Energy Solutions Laboratory raises the bar for future buildings by using net-zero site energy

7 CAMPAIGN GEORGIA TECH

Message from campaign chair John F. Brock III, ChE '70, MS ChE '71, and summary of ChBE objectives and gift opportunities

11 ANNUAL LECTURES FEATURE PROMINENT LEADERS

Dr. Sandra Fryhofer, ChE '79, presents the ConocoPhillips/Silas Ethics Symposium, and Dr. Mark E. Davis delivers the Ashton Cary Lecture

IN EVERY ISSUE

CHAIR'S REPORT	3
MAKING A DIFFERENCE	6
EAB PROFILE	10
ALUMNI NEWS	12

ON THE COVER.....8

Our researchers are working toward developing new treatment methods for diseases and novel techniques for meeting the energy and sustainability needs for a healthy environment.

Georgia Tech's School of Chemical & Biomolecular Engineering (ChBE) was established in 1901, making it one of the first chemical engineering programs in the country. With 700 undergraduates, 200 graduate students, and more than 40 full-time faculty members, it is also one of the largest. The mission of ChBE is to provide students with the intellectual basis to be educated citizens, to prepare them for successful professional careers, and to advance the science and technology that form the basis of chemical & biomolecular engineering.

WE WELCOME YOUR QUESTIONS, COMMENTS & NEWS

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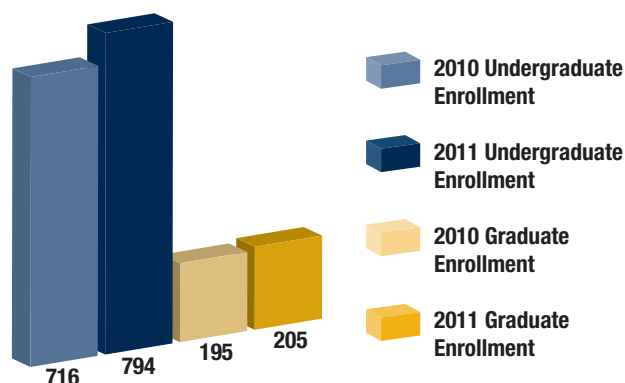
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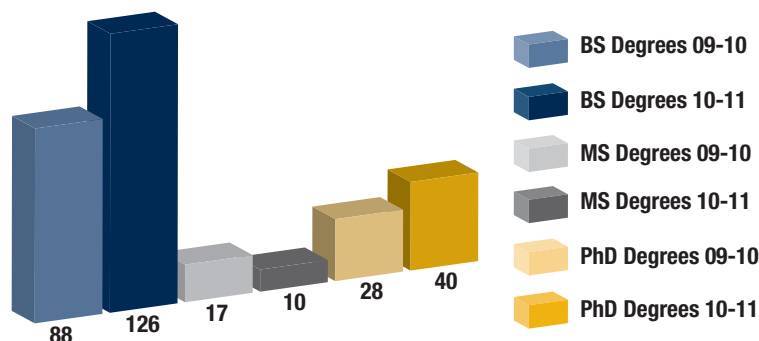
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CHAIR'S REPORT

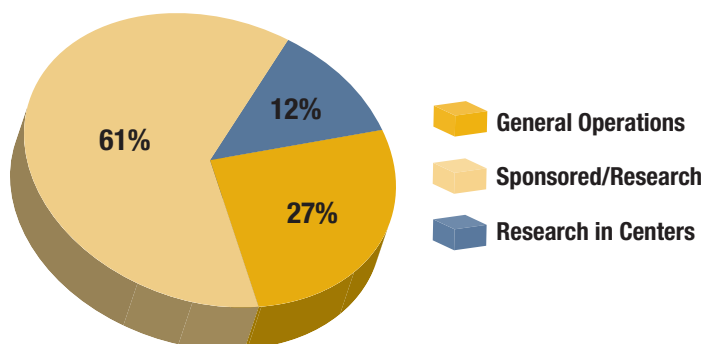
STUDENT ENROLLMENT



DEGREES AWARDED



FY 2011 EXPENDITURES



OUR NUMBERS

FACULTY & STAFF (Fall 2011)

Tenure-Track in ChBE	38
Assistant Professors	9
Associate Professors	8
Professors (9 endowed chairs or professorships)	21

General Faculty	74
Professors of the Practice	2
Academic Professional	1
Joint Appointed Faculty	5
Adjunct Faculty	3
Emeritus Faculty	12
Research Faculty	6
Postdoctoral Associates	45

General Staff	26
Business, Finance, Administrative	19
Communications	1
Information Technology	3
Machine Shop, Facilities	3

STUDENTS

Enrollments	Fall 2010	Fall 2011
Undergraduates	716	794
MS & PhD	195	205

Degrees	2009-10	2010-11
BS	88	126
MS	17	10
PhD	28	40

RESEARCH

	2009	2010
ISI Publications	213	229
Other Publications	27	40
Presentations	293	296
Seminars	119	116
Patents* & Invention Disclosures	43	45

EXPENDITURES

	FY 2010	FY 2011
General Operations	\$8,750,000	\$9,390,000
Sponsored/Research	\$16,970,000	\$21,660,000
Research in Centers [†]	\$4,000,000	\$4,000,000
TOTAL	\$29,720,000	\$35,050,000
State	\$9,226,000	\$9,650,000
Non-State	\$20,494,000	\$25,400,000

FY 2011 Expenditures Compared to FY 2007

General Operations	+42%
Sponsored/Research	+202%
Research in Centers	no change

*issued or filed | [†]estimated

Dr. Arnold Stancell

APPOINTED TO THE NATIONAL SCIENCE BOARD

The U.S. Senate voted in late September to confirm Dr. **Arnold F. Stancell**, emeritus professor and Turner Servant Leadership Chair in the School of Chemical & Biomolecular Engineering, as one of the newest members of the National Science Board (NSB).

Earlier this year, President Obama nominated Stancell to the board, which is the governing body of the National Science Foundation (NSF). Composed of 24 members, including Georgia Tech President **G. P. "Bud" Peterson**, the board serves as policy advisor to the President and Congress, oversees NSF's \$7 billion annual budget, and makes recommendations on funding competitively reviewed research proposals from U.S. universities and other research organizations.

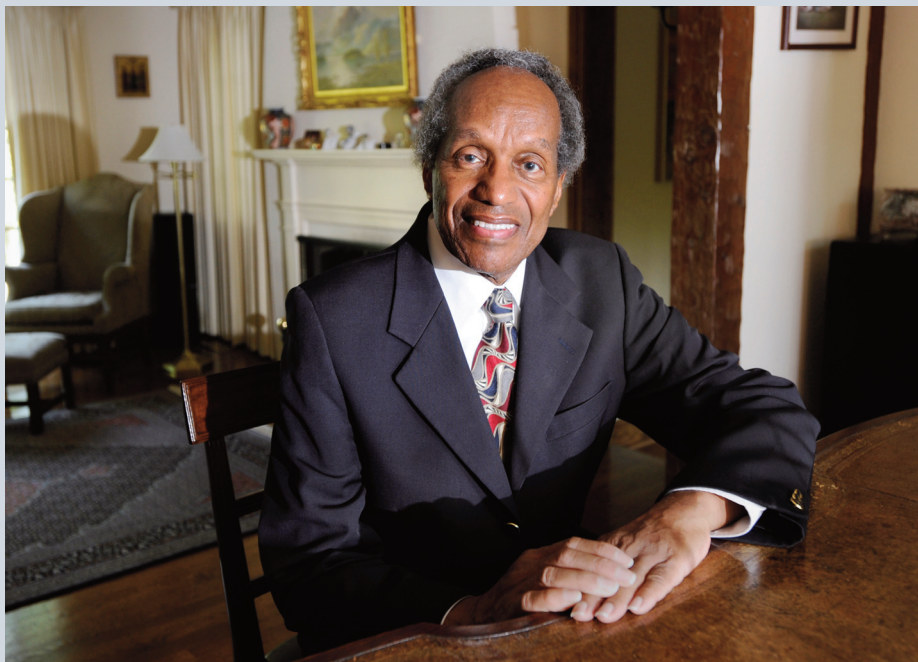
Candidates for the NSB must demonstrate leadership, intellectual contributions, breadth, depth, and understanding of scientific knowledge, distinguished service, and potential for further contribution. "I am honored by the President's nomination, and I look forward to the opportunity to use my experience in technology and business to help foster science and engineering advances for the nation," Stancell says.

Stancell joined the Georgia Tech faculty in 1994 after a 31-year career at Mobil Oil, where he first worked in research and development for ten years. He later served as vice president of U.S. exploration and production, and then retired in 1993 as vice president of international exploration and production after initiating, negotiating, and launching the now \$70 billion Mobil-Qatar joint venture in liquefied natural gas, serving markets worldwide.

He graduated magna cum laude in chemical engineering from the City College of New York and began his career in 1958, working for Esso at its Bayway Refinery in the Port of New York and New Jersey. Not long afterward, he decided to return to school and earned his doctoral degree in chemical engineering from the Massachusetts Institute of Technology (MIT), where he later returned as a visiting professor.

While at MIT, Stancell mentored David Lam, a doctoral student who expanded on Stancell's research on the reaction of plasmas (ionized gases) with surfaces. Lam ultimately utilized this work in the creation of computer chips, where plasmas were able to etch much smaller circuits into silicon, allowing for more numerous transistors on a chip.

Lam went on to found Lam Research, which provides equipment to companies worldwide that manufacture the chips running today's ever-



Dr. Stancell in his Greenwich, Connecticut home.

Photo: Bob Luckey/Greenwich Time

smaller computers and electronic devices. Although Stancell was offered tenure at MIT, he decided to return to Mobil.

A member of the National Academy of Engineering (NAE), Stancell is also the recipient of the National Award for Chemical Engineering Practice given by the American Institute of Chemical Engineers. *U.S. Black Engineer & IT Magazine* named him Black Engineer of the Year in 1992, and in 1997, he was chosen by AIChE as one of One Hundred Chemical Engineers of the Modern Area. He was also selected by Georgia Tech students as the Outstanding Chemical Engineering Professor of the Year in 1997 and 2004.

Stancell's nomination to the NSB marks the second time in recent years the government has called upon him for service. Shortly after the BP oil spill, the National Academy of Engineering asked him to serve on a committee formed at the request of the U.S. Department of the Interior. The committee investigated the cause of the rig explosion that resulted in one of the worst oil spills in U.S. history and provided recommendations to prevent similar incidents from occurring in the future. Stancell advised on near-term steps to improve offshore drilling safety, which President Obama formally announced in May 2010.

Stancell's experience in higher education gives him insight into the research conducted by universities that seek funding from NSF. That insight, coupled with his expertise in energy, petrochemicals, and polymers, distinguishes him as an eminent leader well prepared for service on the NSB. His passion for science and engineering also fuels his enthusiasm for his new role.

"Technology is exciting," Stancell says. "You open up new areas of innovation and then new jobs are created, triggering economic growth, which is the kind of momentum the National Science Foundation can bring about."

Georgia Tech's new Carbon-Neutral Energy Solutions Laboratory (C-NES) raises the bar for future buildings by using net-zero site energy.

Better THAN Zero

Rendering of the north elevation of the C-NES Lab, courtesy of HDR Architecture, Inc.

A new building designed for energy-efficiency research is itself a study in sustainability. As part of the American Recovery and Reinvestment Act, the National Institute of Standards and Technology (NIST) awarded the Georgia Tech Research Corporation an \$11.6 million grant in 2010 toward the construction of a pilot-scale laboratory for carbon-neutral energy solutions.

As the \$23.3 million project reaches its halfway mark, the 45,000-square-foot Carbon-Neutral Energy Solutions (C-NES) Laboratory will open in late 2012 with the distinction of Platinum certification in Leadership in Energy and Environmental Design (LEED).

Developed by the U.S. Green Building Council in 2000, LEED provides a framework of standards for environmentally sustainable construction in six major categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources, innovation and design process, and indoor environmental quality. Platinum is the highest of four certification levels in the LEED green building rating system. Building projects that have attained this rigorous level of certification are among the greenest in the world.

From design, construction, and all elements of its anticipated daily operation, the C-NES Lab achieves carbon neutrality with net-zero site energy use. According to Michael Babcock, an energy model manager with EMO Energy Solutions, net-zero site energy use is defined as net-zero energy consumption and zero carbon emissions annually. By effectively using several energy-saving designs, including a full photovoltaic array, the facility optimizes passive energy technologies, reduces electrical loads, and maximizes the use of renewable energy.

ChBE School Chair **Ronald Rousseau** foresees the cutting-edge energy research efforts housed within the facility will include studies of high-efficiency combustion, biomass gasification kinetics, biochemical-enzymatic conversion of biomass, and carbon dioxide capture from sources including power plants and combustion engines.

"The C-NES Lab will house a variety of energy research programs requiring both large-scale and intermediate-scale capabilities," says Rousseau. "The facility will serve as a catalyst of research activities essential for solving the unique and complex energy challenges facing the world today."

Strategically located in the North Avenue Research Area (NARA) of the campus, the C-NES Lab will greatly expand and enhance Georgia Tech's research efforts to create energy-efficient products and sustainable energy sources for American industries and consumers.

NIST awarded more than \$123 million in American Recovery and Reinvestment Act grants to 11 universities and one nonprofit organization. "These awards will create jobs by helping to fund 12 major, shovel-ready construction projects," U.S. Commerce Secretary Gary Locke says. "These new, state-of-the-art facilities will help keep the United States at the forefront of scientific and technological innovation and will support economic growth."

KEY ISSUES

- On a square-foot-basis, laboratories consume about ten times the energy of office buildings.
- One six-foot fume hood consumes as much energy annually as a 2,500-square-foot home.



Rendering of the south elevation of the C-NES Lab, courtesy of HDR Architecture, Inc.

Promoting Success

THROUGH *Giving*

Memories of his time as a student at Georgia Tech inspired **William W. "Bill" Dowdy**, ChE '54, MS ChE '63, to include a special gift to Georgia Tech as part of his charitable estate planning. Dowdy and his wife, Katherine, have established what will one day become an unrestricted endowment fund for the School of Chemical & Biomolecular Engineering.

Many of Dowdy's favorite stories about Georgia Tech include experiences that led him to develop a strong work ethic. Although he was a good student in school while growing up in the Red Bank area of Chattanooga, Tennessee, nothing had prepared him for the rigorous academic demands of Georgia Tech. He completed his first quarter with a 1.8 GPA.

"Back then, there was a saying," Dowdy recalls. "Look to your left, look to your right; one of you won't be here next year." It appeared that Dowdy was one of those students destined not to make it past the first year. However, after learning he would lose his co-op assignment due to his poor grades, combined with the fear of disappointing his father, he begged for a second chance.

Fortunately, James Wohlford, the director of the co-op division at the time, believed in Dowdy's ability to succeed and allowed him to spend the next quarter working. "My first experience as a co-op was a blessing, and it gave me the opportunity to understand what I was doing wrong in the classroom," Dowdy says. "When I returned to campus, I was better prepared to be a good student." After finishing the next quarter with a 3.6 GPA, he earned a 3.0 GPA or higher for every quarter thereafter.

"Something that was very influential to me and drove me to succeed was the peer pressure that I experienced at Georgia Tech," he says. "Five others entered as co-op students in chemical engineering at the same time I did, and we all knew each other very well." Over the years, these six students established a bond built upon friendly competition that endured well beyond their graduation. Dowdy credits much of his early success to the discipline he learned from his friends.

Dowdy also fondly recalls Professor **H. Clay Lewis**, who was known to inspire fear in many students. "You had to make a favorable impression on Dr. Lewis, and he wanted us to be confident and stand up to him," Dowdy says. "He taught us to be prepared to prove we were right, and he worked hard to incorporate real problems into his lectures. I made an A in all three of his classes, and I respected him and appreciated the way he made us think about practical applications of complicated chemical engineering principles."

Dr. Lewis often asked a recurring question, recalls Dowdy. The professor would present a challenging problem to the class, and he would "bet a dollar for a donut that no one could figure it out." Many times, true to his word, Dr. Lewis would arrive in class with a donut for the student who had proven him wrong.

After graduation, Dowdy spent three years working at the DuPont Experimental Station in Wilmington, Delaware. When faced with the possibility of an unwanted transfer with DuPont, he reached out to the school chair of chemical engineering, Dr. Homer Grubb. "Once again, Georgia Tech extended a unique opportunity to me when Dr. Grubb helped me secure a fellowship so I could return to school," recalls Dowdy appreciatively.

In 1963, after completing his master's degree, Dowdy returned to DuPont, accepting a position at the Chattanooga plant, which is where he had wanted to work all along. He remained there for the last thirty years of his career,

working on the development of textile and industrial fibers, including a variety of experimental products. He retired in 1986, and he and Katherine still live in the Chattanooga area on Signal Mountain.

Memories of Georgia Tech are very important to Dowdy. He appreciates the quality education the School of Chemical & Biomolecular Engineering provides to its students, and he is proud of the leaders the Institute produces. "Young people today can go to Georgia Tech and get the training and the knowledge they need to be successful in their careers," he says. In fact, Dowdy believes Georgia Tech is successful at everything it does, from developing the best academic programs to conducting innovative research. "I want to promote success," he says. "Georgia Tech meant the world to me, and I want to give back to the chemical engineering program that has given so much to me throughout my career and my life."

Katherine is just as enthusiastic as her husband is about Georgia Tech. A native of Carrollton, Georgia, she and Dowdy met through a business acquaintance. The couple celebrated their 43rd wedding anniversary in July. A recognized leader in the community for her work at the First-Centenary United Methodist Church and the Garden Club of Signal Mountain, Katherine is proud of the legacy of success that has inspired the couple's generous gift. "Georgia Tech is so much a part of our lives, even today," she says, "and I am honored to be able to give back to the school that has meant so much to both of us."



Photo: Alex McMahan Photography



Photo: Alex McMahan Photography

Bill and Katherine Dowdy with their cat, Precious.

Photo: Gary Meek



John Brock at the public launch of the campaign.

Philanthropy has been woven into the fabric of Georgia Tech since its founding 125 years ago, and private support has shaped the campus and created the qualitative advantages—in teaching, research, facilities, and student life—that elevate a good university to a great one. They are advantages that state appropriations alone cannot provide.

Our vision for the future is to define the technological university of the twenty-first century. This means leading in innovative research and the commercialization of products to improve the human condition. It means leading in the education of bright young scholars. And it means leading in addressing critical social, technological, and policy decisions of our time.

Mary and I have been extremely grateful for the opportunities afforded to us as a result of my Georgia Tech education, and we feel a personal obligation to give back to the Institute that has given us so much. We are following the path forged by those who have come before us. **Larry Gellerstedt**, ChE '45; Erskine Love, ME '49; Charlie Yates, GS '35; Ivan Allen, Commerce '33; **Pete Silas**, ChE '53; **Tom Gossage**, ChE '56, MS ChE '57; Al West, AE '64—they all sat where we sit today. These great alumni were consummate leaders and personal philanthropists. They were champions for Georgia Tech, and they have shown us the way. Now, it is our turn to step forward.

To seize the opportunities that abound, and to make the Institute's vision a reality, we have launched Campaign Georgia Tech. With the support of our alumni and friends, we can achieve great things.

This is our time. This is our legacy.

Sincerely,

John F. Brock III, ChE '70, MS ChE '71
Chairman, Campaign Georgia Tech

Campaign

Georgia Tech



Summary of ChBE Objectives

Permanent Endowment	\$13,000,000
Student Support	\$1,500,000
Faculty Support	\$6,000,000
Program Enrichment	\$500,000
Unrestricted	\$5,000,000
Facilities & Equipment.....	\$4,500,000
Renovations.....	\$1,000,000
Equipment	\$3,500,000
Current Operations	\$27,500,000
Student Support	\$1,500,000
Faculty Support	\$4,500,000
Directed Programs.....	\$16,000,000
Program Enrichment.....	\$3,500,000
Unrestricted.....	\$2,000,000
Total.....	\$45,000,000

ChBE Named Commemorative Gift Opportunities

Unrestricted Endowment

Named School	from \$25,000,000
Named Research Laboratories.....	from \$2,000,000
Named Auditorium.....	from \$1,500,000
Named Unrestricted Endowment Fund.....	from \$25,000

Faculty Support Endowment

Named School Chair	from \$2,500,000
Named Faculty Chair	from \$1,500,000
Named Faculty Professorship	from \$1,000,000
Named Early-Career Award	from \$750,000

Student Support Endowment

Graduate Students

Named Fellowship (Full)	from \$1,000,000
Named Fellowship (Partial)	from \$25,000–\$250,000

Undergraduate Students

Named Scholarship Fund (Full)	from \$500,000
Named Scholarship Fund (Partial)	from \$25,000

Program Enrichment Endowment

Named Program Enrichment Fund	from \$250,000
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HOW Chemical Engineers *improve your life*

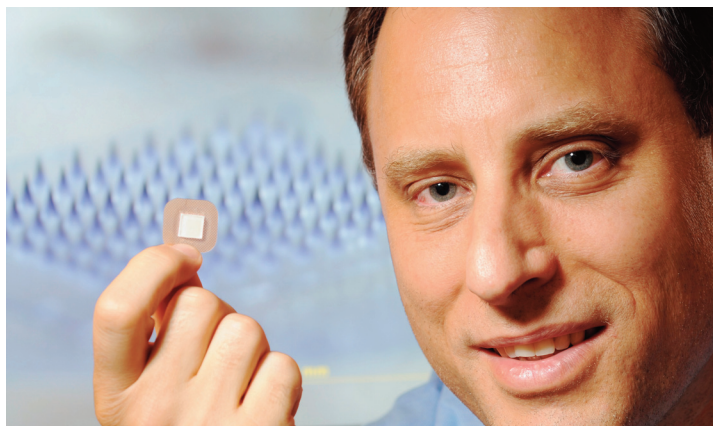


Photo: Gary Meek

Creating a Microneedle-based Vaccine Patch

Research led by Dr. **Mark Prausnitz** has resulted in the development of patches containing hundreds of tiny microneedles that could one day replace hypodermic needles for drug and vaccine delivery. Made of a medical polymer, the needles painlessly enter the skin and carry vaccine particles directly to specialized cells used by the body to battle invading microbes. About the size of a postage stamp, the patch could be available within five years. Its simple design allows for administration by persons without medical training, which provides a realistic method to rapidly immunize large populations during pandemics.

Our researchers are developing
new treatment methods for
diseases and novel techniques
for meeting the energy and
sustainability needs for a
healthy environment.

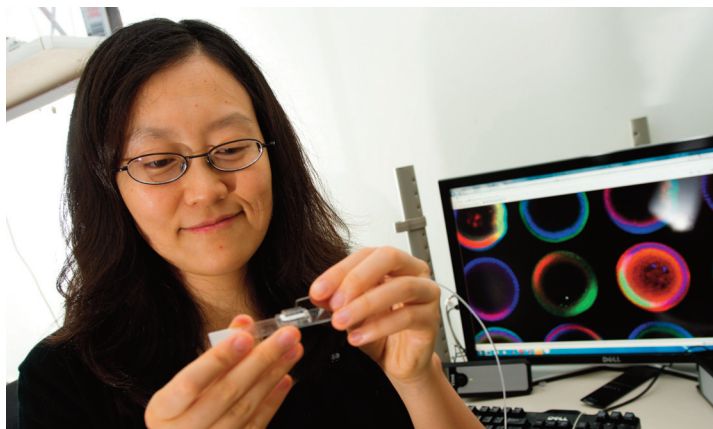


Photo: Rob Felt

Pinpointing Origins of Developmental Disorders

Learning more about fruit fly embryonic development may lead to a better understanding of developmental disorders. Using a microfluidic device designed to rapidly and reliably sort hundreds of fruit fly embryos, Dr. **Hang Lu** studies proteins on the dorsoventral axis. As development continues, these proteins evolve into muscle, nerve, and skin tissues. Understanding embryogenesis at a more quantitative level will elucidate the operation of genetic and multicellular networks that drive development. Not only will this knowledge provide a framework for investigation aimed at preventing developmental disorders, it may also provide guidelines for tissue engineering and regenerative medicine.



Photo: Shutterstock Images

Removing Carbon Dioxide from Flue Gases

Power plants produce roughly one third of all CO₂ emitted in the U.S. each year. Current technologies for CO₂ removal exist, but they consume about a third of the energy produced by each plant. Several ChBE researchers, including Drs. **Christopher Jones, Yoshiaki Kawajiri, William Koros, Carson Meredith, Sankar Nair, Matthew Realff, David Sholl, and Krista Walton**, are using the unique high-density properties of hollow-fiber composite membranes and hollow-fiber sorbents to develop cost-effective techniques for removing this greenhouse gas from power plant emissions. Although developing an effective CO₂ removal system is challenging, a similar technique has proven successful in water desalination facilities.

For more details about these projects and other ways ChBE faculty members are working to improve the world, visit chbe.gatech.edu/research.



Photo: Rob Felt

Understanding the Evolution of Cancer

The development of cancer is a complex process involving many stages. Dr. **Michelle Dawson** investigates the role of bone marrow-derived cells (BMDCs) in tumor growth and metastasis. This process is mediated by tumor secretion of proangiogenic chemokines that enter the blood circulation and travel to the bone marrow, where they mobilize BMDCs. She has found that BMDCs rapidly accumulate in tumors, promoting their growth and metastasis through formation of blood vessels and degradation of extracellular matrix components. Understanding the migratory process of these cells and their role in the evolution of cancer is critical to developing new detection and treatment methods for the disease.



Photo: Filler Research Group

Developing Viable Options for Solar Energy

Worldwide energy demands exceed 13TW and are expected to reach 30TW by 2050. Fossil fuels account for 85% of energy production and emit CO₂. Yet more sunlight energy strikes the Earth in one hour than all the energy consumed worldwide in a year, suggesting that positive environmental change may result from collection, conversion, and storage of solar radiation through photovoltaic systems. These systems convert photons from the sun directly into electricity but currently are cost prohibitive and inefficient. To create a viable photovoltaic system, Dr. **Michael Filler** is pioneering in-situ techniques to examine nanoscale optoelectronic materials and use this information to subsequently engineer their properties.

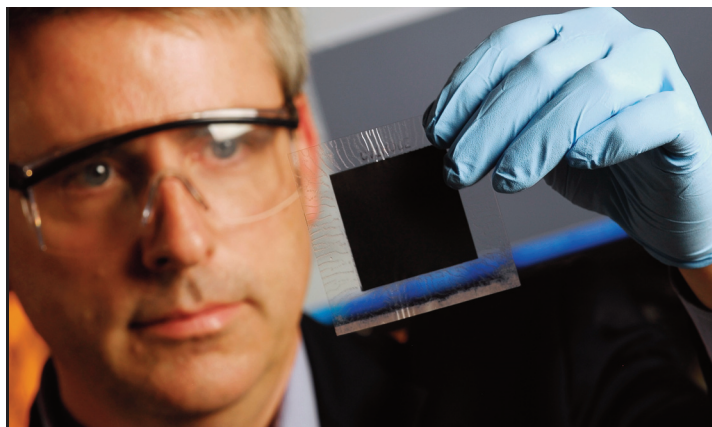


Photo: Gary Meek

Improving Fuel Cell Durability

Fuel cell devices convert chemical energy from a fuel into electricity through a chemical reaction with an oxidizing agent. They produce electricity for as long as fuel and oxygen are supplied. Bringing better devices to market will reduce U.S. dependence on petroleum needed to power aircrafts, vehicles, heat systems, and electronic systems. Understanding how and why fuel cells fail is key to reducing cost and improving durability. Fundamental problems with current devices include chemical attack of the membrane, carbon corrosion, and platinum instability. Dr. **Thomas Fuller** is taking a multidisciplinary approach to solving these failure mechanisms to revolutionize the development of new application-specific prototypes.



Photo: Karin P./Flickr Creative Commons

Designing a Pancreatic Substitute

Developing a biological substitute to treat diabetes is hampered by the availability of donor tissue and the need to immunosuppress transplant recipients. Tissue substitutes based on non-pancreatic cells retrieved from the recipient patient and engineered for physiologically responsive insulin secretion may overcome these limitations. Dr. **Athanassios Sambanis** is engineering an artificial pancreas consisting of recombinant hepatic and enteroendocrine cells that produce a more sustained secretory response and a more acute phase of insulin secretion. Together, the two cell types will better mimic the function of beta cells found naturally in the pancreas.

Jim Simmons

Like most boys growing up in the 1950s, James F. “Jim” Simmons, Text '66, MS Text '67, enjoyed playing sports and rooted for his favorite teams. Born and raised in the small, textile-mill town of Griffin, 40 miles south of Atlanta, Simmons recalls the longstanding rivalry between Tech and UGA. “Of course, growing up in Georgia required that I declare myself a Bulldog or a Yellow Jacket,” he recalls. “With Bobby Dodd at his peak, and my adeptness in science and math, I chose Georgia Tech.” From that moment on, Simmons has been a loyal fan. Today, he is committed equally to Georgia Tech sports, research, and academics.

As Simmons progressed through school, excelling in math and science, he was encouraged by family and teachers to consider college, and specifically, Georgia Tech. Simmons applied for several scholarships and received one from the Georgia Textile Manufacturers Association, which paid for tuition in the School of Textile Engineering. “I was fortunate to be accepted into the co-op program and even more fortunate to be offered an assignment at Dundee Mills in Griffin, thanks to an employee who was also a Georgia Tech alumnus,” says Simmons.

After completing a bachelor's degree in 1966, Simmons earned a master's degree the following year and then went to work for DuPont as a research engineer in Wilmington, Delaware. After leaving DuPont, he worked at Celanese Corporation, where he stayed for 32 years, retiring as president of the acetate division in 2000.

“I realized three months into my retirement that my golf game was so ugly that I needed to go back to doing something that I was good at—business,” Simmons jokes. Not wanting to return to the corporate world, he joined a startup technology business just as the Internet boom went bust. Using knowledge gained from that failure, Simmons entered into a partnership with Tom Wilson, a former Celanese co-worker who had already been a successful consultant for many years. Together, they formed Custom Solution Builders, LLC (CSB). “Our business model utilizes our analytical abilities and business acumen to help small- to mid-size companies solve problems,” Simmons says. “We have an extensive network of companies that need assistance, as well as a large number of subject-matter experts who want to perform project work. CSB is the catalyst that brings these two elements together to create customized solutions.”

During his tenure at Celanese, Simmons served as the corporate representative to Georgia Tech, managing recruiting and research activities by making frequent visits to campus. In 1992, he met ChBE School Chair **Ronald Rousseau**, who recruited him to serve on the ChBE External Advisory Board (EAB). “I consider my role on the EAB a fortunate one because it allows me to stay involved with Georgia Tech and continue to be on campus and witness the growth of the Institute and ChBE.”

Impressed by the evolution of the School, Simmons is proud to be part of its growth. “Under Ron's leadership and with active support of the EAB, ChBE has evolved into what it is today,” he says. “However, the real accomplishment has not been only the upgrade of the physical space, classrooms, and research labs, but the development of the faculty. Ron has recruited and developed one of the best teaching and research engineering faculties in the country!” The College of Engineering recognized Simmons for his leadership and contributions



Photo: Simmons Family

Jim Simmons with his family. From left: son-in-law Steve, daughter Lara, wife Peggy, and granddaughters Isabel and Caroline.

to Georgia Tech in 1996 by inducting him into the Academy of Distinguished Engineering Alumni.

In addition to his service on the EAB, Simmons works with the Mecklenburg County Council of Boy Scouts of America in Charlotte. He is a past member of the Georgia Tech College of Engineering Advisory Board and the Charlotte-Mecklenburg County Arts and Science Council. He also served as division chair for United Way of Central Carolinas.

Simmons believes in giving back to his community, friends, and family whenever possible. “With over 40 years of business experience and 66 years of life experience, I think it is important to share that learning and knowledge. I have been fortunate over my life to have many people who taught me, and now I am in a position to pass that on,” he says. “It doesn't matter if I am helping a local young businessman or my daughter.”

Yet, Simmons always comes full circle, back to Georgia Tech, where he believes he received the true launch to his successful career. “I am especially proud to be able to help the Institute,” he says. “My education opened so many doors for me that would have been closed otherwise, and Georgia Tech provided me with the knowledge to address complex problems in a logical way.”

When he is not busy working or helping others, Simmons enjoys exercising, skiing, reading, and traveling. “Those are my favorite hobbies,” he says. “However, my passion is my family, including my two granddaughters, Caroline, who is 11 and shares my birthday, and Isabel, who is 9 and shares my blue eyes. My wife, Peggy, and I are blessed that our granddaughters live less than ten minutes from us so we are an integral part of their lives.”

ChBE Annual Lectures



Dr. Sandra Adamson Fryhofer, MD, MACP, FRCP

Ethics, leadership, and quality, grounded in strong communication skills and professionalism, are essential components of an engineering education. Named in honor of **C.J. "Pete" Silas**, ChE '53, the ConocoPhillips/C.J. "Pete" Silas Program in Ethics and Leadership spotlights these core values in an annual public symposium featuring prominent industrialists and ethicists.

Held on August 31, the 2011 event featured Dr. **Sandra Adamson Fryhofer**, ChE '79, who presented "Seven Commandments." Her lecture focused on the importance of ethical decisions in medical research and practice.



Dr. Mark E. Davis

Established as a memorial to **Ashton Hall Cary**, ChE '43, the Ashton Cary Lecture series features distinguished scholars in fields of significance to chemical engineering. The visiting lecturers, in addition to presenting seminars on recent engineering advances, participate in informal discussions with Georgia Tech faculty and students.

Dr. Mark E. Davis, the Warren and Katharine Schlenger Professor of Chemical Engineering at the California Institute of Technology, presented the 26th annual lecture on March 9, 2011. A member of the City of Hope Comprehensive Cancer Center in Duarte, California, Dr. Davis focused his lecture on "Fighting Cancer with Nanoparticle Medicines."

WEEKLY SEMINARS

In addition to its annual lectures, ChBE hosts a weekly seminar throughout the year with invited lecturers who are prominent in their fields. The 2011 seminar series included the following speakers:

Dr. Bruce E. Dale
Michigan State University

Dr. Raul F. Lobo
University of Delaware

Dr. Eray S. Aydil
University of Minnesota—Twin Cities

Dr. Linda J. Broadbelt
Northwestern University

Dr. Orlin D. Velev
North Carolina State University

Dr. Patrick S. Doyle
Massachusetts Institute of Technology

Dr. Michael S. Wong
Rice University

Dr. Kaushal Rege
Arizona State University

Dr. Babatunde A. Ogunnaik
University of Delaware

Dr. Venkat Venkatasubramanian
Purdue University

Dr. Hana El-Samad
University of California—San Francisco

Dr. Bob Peoples
ACS Green Chemistry Institute

Dr. Jennifer Maynard
University of Texas—Austin

Dr. Stuart Cooper
The Ohio State University

Dr. Subir Bhattacharjee
University of Alberta, Canada

Dr. Sean C. Smith
Oak Ridge National Laboratory

Dr. James R. Swartz
Stanford University

Dr. Manos Mavrikakis
University of Wisconsin—Madison

Dr. Alan C. West
Columbia University

Dr. Sergey Vasenkov
University of Florida—Gainesville

1940s

Frank A. Stovall, ChE '43, MS EE '49, in February 2011, celebrated 67 years of marriage to Marjorie Hailey of Atlanta. The couple has four children, seven grandchildren, and one great grandchild. Stovall, who was on the track and tennis teams at GT, continues to play singles tennis twice a week. He was ranked No. 1 in his age group in Georgia in 1997 and 2008. After receiving his Navy ROTC commission, he served in World War II and in the Korean War. He retired from Lockheed Aircraft in 1984, after 32 years with the company. He also received two patents for hot forming titanium. In 2009, Stovall published *Investing for Fun—and Profit*, a book detailing more than 50 years of his stock investments.

1950s

Darryl C. Aubrey, ChE '55, was elected mayor of North Palm Beach, Fla., in March 2011. He served on the village council for five years as president pro tem and vice mayor prior to his election. After retiring from Exxon Chemical Company after 31 years of service in technical and management roles, he was a tenured faculty member and department chair at Sacred Heart University for 11 years.

Noel Malone, ChE '57, has been married to his wife, Ada Lee, for 52 years. Their son, Michael, lives in Burbank, Calif., and works in the motion picture industry. A member of Sigma Chi fraternity while at GT, Malone retired from a 39-year career in marketing with Eastman Chemical Company in Kingsport, Tenn., in 1996. The couple moved to Springdale, Ark., in 2005, and lives in Scottsdale, Ariz., during the winter.

1960s

Donald Bivens, MS ChE '63, PhD ChE '66, was a recipient of a Distinguished Service Award from the American Society of Heating, Refrigerating and Air-Conditioning Engineers at the so-

ciety's annual conference in June 2010. Bivens retired from DuPont Fluoroproducts in Wilmington, Del., as senior technology fellow and now works as an independent refrigerant applications consultant. He lives in Kennett Square, Pa.

Joseph P. Stoner, ChE '66, was named a fellow of the American Chemical Society (ACS). Stoner enjoyed a long career in sales of analytical instruments, primarily high pressure liquid chromatography devices. He worked for Shimadzu Scientific Instruments, Alcott Chromatography, and Kratos and Spectra-Physics. More recently, Stoner worked for Habitat for Humanity—DeKalb in Tucker, Ga., retiring as executive director in 2010. He is a member of the ACS budget & finance committee and represents the Georgia section of the ACS as a council member.

1970s

Curt Harrington, MS ChE '77, was appointed to the Board of Legal Specialization of the State Bar of California as an advisory commission chair. He also completed a term of service on the Tax Law Advisory Committee of the Board of Legal Specialization, serving as chair for one year. Harrington specializes in tax, patent, and trademark law, and is the only attorney in California holding a specialization in taxation law who is also a registered patent attorney with master's degrees in electrical engineering, chemical engineering, and business.

1980s

Wilbur Strickland, ChE '82, has been named vice president for global chocolate research, development, and quality at Kraft Foods. He is responsible for core chocolate technology and innovation platform development across R&D sites around the globe. Strickland and his family live outside of Zurich, Switzerland.

2011 ALUMNI AWARDS INDUCTION CEREMONY

ENGINEERING ALUMNI HALL OF FAME



Paul D. Espy, ChE '65 (fourth from left) and James P. "Jim" Harris, ChE '70 (far right).

ACADEMY OF DISTINGUISHED ENGINEERING ALUMNI



Anthony A. Coker, ChE '84 (back row, third from right).

COUNCIL OF OUTSTANDING YOUNG ENGINEERING ALUMNI



Dana P. Harmer, ChE '95 (second from left).

Kent Masters, ChE '83, has been appointed as the next CEO for Swiss construction firm Foster Wheeler AG.

Carolyn Meyers, MS ME '79, PhD ChE '84, has been named president of Jackson State University in Jackson, Mississippi. Meyers, who has more than 30 years of experience in higher education, previously served as president of Norfolk State University in Virginia.

Art Graham, ChE '87, was appointed by Florida Gov. Charlie Crist to the state's Public Service Commission in July 2011. He was then elected chairman of the commission in October. In that position, he also acts as the chief administrative officer of the PSC.

1990s

Jason Speck, ChE '98, and **Kristin Speck**, ChE '01, announce the birth of son Logan William on Nov. 14, 2010. Jason is an associate director at Pearl Therapeutics, and Kristin is a group manager at the Clorox Company.

David Weber, ChE '99, and his wife, Shanon, celebrated the second birthday of son Tyler Michael on Dec. 11, 2011. The family lives in Chattanooga, Tenn.

2000s

Liz Roellig Manning, ChE '01, and her husband, Mike, announce the birth of son Logan Andrew on Jan. 28, 2011. Manning is a process engineer at Lyondell-Basell Houston Refining. The family lives in Friendswood, Texas.

Kenyata Martin, ChE '01, is brand manager for Old Spice Global Innovation at Procter & Gamble. He is responsible for the five-year innovation strategy and global expansion of this \$500 million business. His nine-year career at Procter & Gamble has included being an inventor on a patent and leading the strategic development of award-winning advertising. Martin was featured in the 2011 P&G Annual Report, discussing the thinking behind

Old Spice's successful "Smell Like a Man, Man" ad campaign.

Manisha Nilakantan was born on Aug. 26, 2011, to **Shalini Rao Nilakantan**, ChE '01, and her husband, Nikhil. The family lives in Dallas.

Wendy Anderson Cocke, ChE '02, and her husband, Andy, announce the birth of son Anderson Jackson "A.J." on June 21, 2010. Cocke works as a product developer for Kimberly-Clark Healthcare in Roswell, Ga. The family lives in Marietta, Ga.

Grace May O'Hara was born on Oct. 6, 2010, to **Jennifer Troeschel O'Hara**, ChE '02, and her husband, Donald. O'Hara is a global account manager for the personal care division of ISP in Wayne, N.J.

David A. Reed, ChE '02, and Sara Pheasant were married on May 29, 2010 in Savannah, Georgia. **John Mark Goodman**, ChE '02, **Eddie Green**, ChE '02, and **Niraj Shetty**, ChE '02, were among the attendees. The couple lives in Atlanta, where Reed is a patent attorney with Sutherland Asbill & Brennan.

Katrina Badgett Liddell, ChE '04, and her husband, Nathan, ME '03, welcomed identical twin girls, Elisabeth Anne and Madeleine Rose, on Dec. 27, 2010. The family resides in Atlanta.

Adam Dean, ChE '05, and his wife, Amanda, welcomed their first child, daughter Harper Vivian, on September 15, 2010. The family lives in Lake Charles, La., where Dean is a process engineer at Louisiana Pigment.

2010s

Robert McFeaters, ChBE '10, has joined Harrington Group as a fire/explosion protection engineering consultant, relocating from Pittsburgh, Penn., to Atlanta for the job. Previously, he worked as an associate field engineer for Halliburton Energy Services.

Georgina Schaefer, ChE '11, competed in the 2011 Berlin Open-Lacrosse for Team USA. The team finished in 2nd place, losing to the Czech Republic in the finals by one point. As a GT student, she participated in undergraduate research led by Dr. **Charles Eckert** and was captain of the women's lacrosse team.

IN MEMORIAM

1930s

Hal Hazelton Strickland Jr., ChE '36, of Greensboro, N.C. and Meadows of Dan, Va., on Dec. 11, 2010. A chemical engineer, Strickland retired from a long career with Burlington Industries during which he ultimately was in charge of purchasing all man-made fibers for the company's manufacturing operations. He worked his way through GT as a co-op student and during World War II, he worked with DuPont developing a wakeless torpedo for the Navy. An avid birdwatcher, he was a member of the Piedmont Bird Club and had sighted more than 1,000 species during his travels, which included a trip to Antarctica to observe penguins.

1940s

John Lawrence "Pete" Gray, ChE '40, of Cartersville, Ga., on Nov. 22, 2010. Gray spent 56 years with the Chemical Products Corporation and its affiliate, the Dellinger Management Company. He retired as president. He served as chairman of the Georgia Business and Industry Association and was a member of the American Institute of Chemical Engineers. Survivors include his daughter **Mary Elizabeth Gray Hart**, ChE '78.

W. Vincent Neisius, ChE '40, of Atlanta, on Sept. 18, 2011. While a student at GT, he was a member of the Sigma Phi Epsilon fraternity. After receiving his master's in mathematics from Emory, he returned to GT and taught math for ten years. Later, he helped design some of the earliest computers, working for Thompson-Ramo Wooldridge from 1961 until his

retirement in 1987. Neisius was also a member of Mensa.

Gordon Crowl Hicks, ChE '42, of Sheffield, Ala., on Dec. 20, 2010. He worked at Radford Ordnance Works in Virginia and the Oak Ridge Atomic Plant in Tennessee before moving to Alabama in December 1945. Hicks retired from the TVA after 33 years as a chemical engineer. He spent his retirement building a pioneer village in Colbert County, Alabama.

Benjamin Ellis Dunaway Jr., ChE '43, of Seaford, Del., on Nov. 28, 2010. Dunaway served in the Army's 11th Airborne Division during World War II and then in the Army Reserve. He retired following a 33-year career with E.I. du Pont de Nemours. He was an active leader in the Boy Scouts and an avid bridge player. He also raised and raced homing pigeons.

John Frederick Richenaker, ChE '43, of Frederick, Md., on Jan. 11, 2011. Richenaker, who earned an MBA from what is now Fairleigh Dickinson University in New Jersey, retired from Unilever as a chemical salesman in 1985. He was a Navy officer during World War II and a member of Phi Gamma Delta fraternity at GT.

George S. Hiles Jr., ChE '45, of Walnut Creek, Calif., on July 20, 2011. He was commissioned an ensign in the U.S. Navy in 1945 and also served in the Korean War. He later worked on computer-controlled production processing of titanium dioxide at DuPont's plants.

Joe Brewton, ChE '47, of Metairie, La., on June 24, 2011. Brewton served in the Army Air Corps in World War II training P-51 fighter pilots. He worked with Shell as a chemical engineer in Houston, New York City, and New Orleans. An avid world traveler, he attended the New York World's Fair in 1939 when he was 17.

George W. Adams, ChE '48, of Glencoe, Ala., on March 25. He traveled extensively in his 35-



year career with Exxon. Adams received a master's degree from Louisiana State University, served in the Army, and was active in the Civitan service club.

William Dewey Fiser, ChE '48, of Columbia, Mo., on Nov. 26, 2010. A longtime resident of Huntsville, Ala., he had a 30-year career as a chemical engineer with Morton Thiokol. He was an Air Force captain with the 315th Bomb Wing during World War II.

1950s

James E. Curry, ChE '50, MS ChE '51, of Madison, Ala., on Oct. 22, 2010. He served in the Army during World War II and later was a federal employee, initially hired by the Army Ballistic Missile Agency in 1957. He worked for NASA for 24 years and earned numerous honors, including the NASA Exceptional Service Medal. He retired from NASA in 1981 as chief of the organization's non-metallic materials branch. Curry, who received a PhD in chemical engineering from the University of Alabama in 1972, taught courses in the university's chemical engineering department, and he later worked for Remtech and Northrop Grumman.

Austin Walker West Jr., ChE '50, of Birmingham, Ala., on Nov. 9, 2010. He worked for Monsanto Chemical Company before joining Reichhold Chemicals Inc. in Tuscaloosa. During World War II, he served in the Army Corps of Engineers on islands in the southwest Pacific. He was a member of Omicron Delta Kappa and Alpha Tau Omega and editor of the *Blueprint* while at GT. While living in Tuscaloosa, he was a member of the Black Warrior Council of the Boy Scouts.

James Raymond Detrio, ChE '51, of Ogden, Utah, on Aug. 27, 2011. He served in the U.S. Navy during World War II and in the Marine Corps during the Korean War. He went on to work for the U.S. Rubber Company in New York City and Mexico City.

William Penland "Pen" Mayson Jr., ChE '51, of Augusta, Ga., on March 12, 2011. He worked for DuPont at the Savannah River Plant for 39 years. A member of the student council and Sigma Nu fraternity at GT, he served two years in the Army Chemical Corps following graduation. Mayson was a senior warden, treasurer, finance chairman, and vestryman at his church. He served on the Augusta City Council for 17 years and was the president of Historic Augusta, Main Street Augusta, and the Augusta Symphony League. He also served on the boards of the Augusta Chamber of Commerce, Augusta United Way, Augusta Red Cross, the Salvation Army, and the Episcopal Day School.

Lyman Wallace Morgan, MS ChE '51, PhD ChE '56, of Myrtle Beach, S.C., on April 5, 2011. He served as a technician third grade in the Pacific Theater in World War II. After graduating from GT, Morgan worked at Phillips Petroleum, taught at the Colorado School of Mines, and served as a research engineer at Monsanto Corporation.

Robert E. Vaughn, ChE '51, of Tampa, Fla., on Dec. 17, 2009. Vaughn was president of Mechanical and Chemical Equipment Company and Brandon Chrysler Plymouth. He also was a graduate of MIT and served as an officer in the Air Force. He served on the GT advisory board, Barnett Bank

board of directors, Hillsborough County Hospital Authority board of trustees, and the boards of the Boys and Girls Clubs of Tampa Bay and Brandon, Florida. He also served on the Hillsborough County education board of the Diocese of St. Petersburg and was a trustee of the Pontifical College Josephinum Seminary in Columbus, Ohio.

John C. Kievit, ChE '53, of Elkton, Md., on Jan. 3, 2011. He retired following a 30-year career with DuPont. He was a Stephen minister at his church, an artist, and an avid reader.

Charles Rupert Turner, ChE '56, of Houston, on Aug. 29, 2011. He retired from Shell Oil Company as manager of government relations in 1994.

Robert Curtis Bevers, Chem '51, ChE '57, of Doraville, Ga., on March 1, 2011. During his career, he was a chemical engineer with General Electric, DuPont, Western Electric, and Lucent Technology.

Harris Burns Jr., CE '54, MS ChE '57, PhD Chem '64, of Waynesville, N.C., on Aug. 30, 2011. He served in the U.S. Army Chemical Corps. Burns also taught at the university level for many years and served as an inaugural member of the faculty of Mercer University's School of Engineering.

John Allen Baker, ChE '59, of Newport News, Va., on Dec. 4, 2010. Baker served three years in the Air Force before beginning a career with Westinghouse Electric in Pittsburgh in 1962. He was transferred to the company's field office at Newport News Shipbuilding in 1970 to work on Nimitz-class aircraft carriers and

retired in 1998. While a student at GT, he was a charter member of Delta Upsilon fraternity and participated in the Air Force ROTC.

1960s

Charles Lee Fox, ChE '65, of Tucson, Ariz., on Nov. 29, 2010.

Lewis Edward Moore, ChE '69, of Springfield, La., on Dec. 26, 2010. In his more than 30-year career, Moore was a project manager for such companies as Ciba-Geigy and Borden Chemicals. He received an MBA from Louisiana State University. Moore was a golfer and a car and model train enthusiast.

1970s

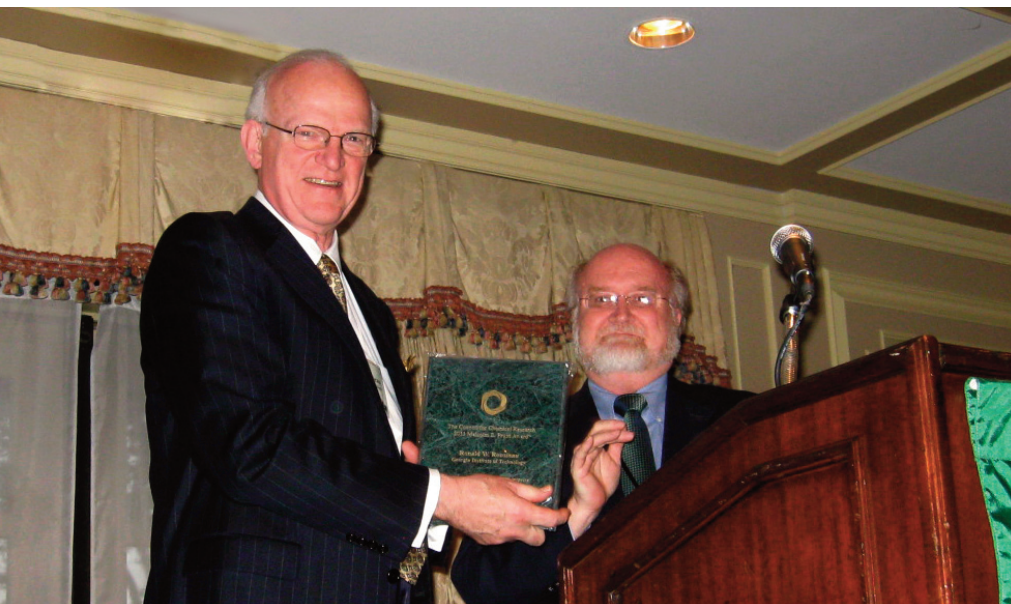
Bob Bukovsky, ChE '76, ICS '87, of Signal Mountain, Tenn., on July 23, 2011. He worked at Synterprise and taught chemical engineering technology at Chattanooga State Community College.

1980s

Perry Duane Maddux, ChE '82, of Hixson, Tenn., on Sept. 25, 2010. He was a nuclear project manager with Tennessee Valley Authority.

1990s

John (Chong Hun) Chon, MS ChE '97, PhD ChE '99, of Marlborough, Mass., on Nov. 22, 2010. He worked in the biotech industry, starting out at Genzyme Corporation and most recently working for Percivia. He received a bachelor's degree in chemical engineering and music from MIT in 1994. Passionate about classical music and jazz, he played in several musical groups, including the Boston Civic Symphony. While at GT, he was a member of a jazz chamber ensemble and the symphonic band.



School Chair Ronald Rousseau (left) receiving the 2011 Malcolm E. Pruitt Award at the Council for Chemical Research annual meeting.

STUDENT NEWS

Undergraduate students **Christina Bins**, **Christopher Hilgert**, and **Samual Wilson** received research grants from the Undergraduate Research Opportunities program administered by the Semiconductor Research Corporation's Education Alliance.

Shannon Capps received a 2011 NASA Earth System Science Fellowship, which will fund her continued work on adjoint and inverse modeling of atmospheric particulate matter. Her research will improve future atmospheric modeling techniques to measure ozone, climate, and air quality. Capps is a member of Dr. **Athanasios Nenes's** research group.

Maria Elena Casas has been awarded a NSF Graduate Research Fellowship. The three-year award includes a \$30,000 annual stipend. Casas is a member of Dr. **Hang Lu's** research group.

Andria Deaguero, who completed her PhD degree this year under the direction of Dr. **Andreas Bommarius**, received a 2011 Teaching Fellowship from the Knowles Science Teaching Foundation. The five-year award provides tuition assistance, monthly stipends, and funds for professional development. Deaguero, who is now enrolled in a teacher preparation program at the University of Colorado, Denver, hopes to teach chemistry at one of Denver's Science, Technology, Engineering, and Mathematics (STEM) schools.

Winners of the 23rd Annual Graduate Symposium were, from first to third place, in the poster session: **Christopher Edmonds**, **Wei Long**, and **Avishek Aiyar**; and in the oral presentation session: **Mehrza Raeiszadeh**, **Tracie Owens**, and **Shannon Capps**.

Brian Kraftschik received the 2012 Air Products Fellowship. Kraftschik is a member of Dr. **William Koros's** research group.

Winners of the 2011 Air Products Undergraduate Symposium were, from first to third place: **Jiawei Luo**, **Jackie Rand**, and **Dongkun Huang**. **Yichen Fang**, **Iva Franjic**, and **Howard Huang** received honorable mentions.

Kendra Maxwell was selected for the 2011 DuPont Fellowship Award from the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE). Maxwell is a member of Dr. **Sujit Banerjee's** research group.

Urban RePeel won first place in Georgia Tech's 2011 Ideas to SERVE Competition for its environmentally friendly business concept that would help minimize the amount of food waste going into Georgia landfills. The Urban RePeel team includes chemical engineering graduate student **Ryan Ravenelle**, who is co-advised by Drs. **Carsten Sievers** and **John Crittenden**.

FACULTY AWARDS AND HONORS

Sue Ann Bidstrup Allen
Appointed Associate Dean for Faculty Development and Scholarship
Georgia Tech College of Engineering

Julie Champion
Georgia Tech Women in Engineering Faculty Award for Excellence in Teaching

Yulin Deng
Elected Fellow of the International Academy of Wood Science

Michael Filler
Georgia Tech CETL/BP Junior Faculty Teaching Excellence Award

Martha Grover
Young Researcher Award from AIChE CAST Division

Christopher Jones
Georgia Tech Outstanding Faculty Research Author Award

William Koros
AIChE 63rd Institute Lecturer

Hang Lu
CSB2 Prize in Systems Biology from the Council for Systems Biology

Athanasios Nenes
Kenneth Whitby Award from the American Association for Aerosol Research

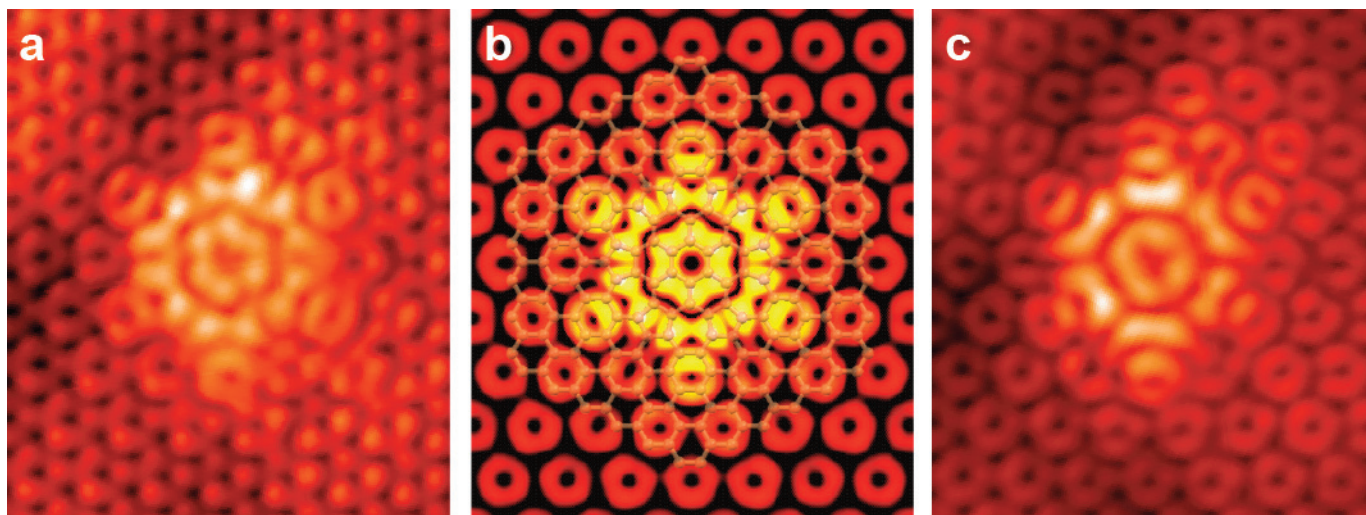
Mark Prausnitz
Named Regents' Professor by the Georgia Board of Regents

Georgia Tech Outstanding Achievement Award in Research Program Development

Elsa Reichmanis
Distinguished Service Award from the PMSE Division of the American Chemical Society

Ronald Rousseau
Malcolm E. Pruitt Award from the Council for Chemical Research

Mark Styczynski
Young Faculty Award from DARPA
Junior Faculty Enhancement Award from Oak Ridge Associated Universities



A class of decorative, flower-like defects in graphene could have potentially important effects on the nanomaterial's already unique electrical and mechanical properties. Flower-like defects in graphene are shown in these images (A and C) produced by a scanning tunneling microscope. Image B was created by a computer model.

The Partnership for Research and Education in Materials (PREM) between three Atlanta University Center (AUC) schools and the Materials Research Science and Engineering Center (MRSEC) at Georgia Tech integrates research, education, and student mentoring in order to increase the number of underrepresented students pursuing graduate degrees and to increase their overall participation in the field of engineering. The three AUC schools are Clark Atlanta University, Morehouse College, and Spelman College. Funded by the National Science Foundation, MRSEC at Georgia Tech focuses its research efforts on the development of new materials to serve as successors to silicon in the semiconductor industry, specifically epitaxial graphene, which holds tremendous promise as an electronic material. Dr. **Dennis Hess**, director of MRSEC, says the broader impact of this program includes a significant enhancement of the infrastructure of AUC for materials research, education, and technology transfer, as well as an equally significant, long-term impact on Georgia Tech diversity programs in science and engineering.