Kubanek honored with presidential research award

Jane Sanders
Research News & Publications

A Georgia Tech faculty member was among 57 researchers awarded honors on May 4 as the nation’s most promising young scientists and engineers. Julia Kubanek, an assistant professor 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) by John H. Marburger III, director of the White House Office of Science and Technology Policy and science advisor to President Bush. Kubanek was nominated by the National Science Foundation (NSF), which funds her research in aquatic chemical ecology with a prestigious NSF Faculty Early Career Development (CAREER) award.

In addition to showing promise as a leader in science and engineering, CAREER award recipients have translated their work into significant educational and research contributions. NSF-supported PECASE recipients represent the best of CAREER winners. Of the 2,900 CAREER awards made since the program began in 1996, only 140 have received presidential recognition.

Kubanek conducts research at the interface of chemistry and ecology to investigate algal toxins and the responses of the ocean’s zooplankton to those chemicals. “She creatively applies and teaches the use of state-of-the-art analytical tools in marine ecology,” noted an NSF news release. “Her students value learning in interdisciplinary science and communication methods, aimed at non-scientists, which bridge fields of science and intersect research and policy.”

One of Kubanek’s primary studies centers on the chemically mediated interactions between aquatic microscropic plants called phytoplankton and animals called zooplankton. Specifically, she is investigating why some phytoplankton get eaten and others — such as toxic algae — don’t get consumed by zooplankton.

Scientists believe certain chemical compounds defend some species of phytoplankton from predators. In laboratory experiments aimed at identifying these compounds, Kubanek incorporates various chemicals from phytoplankton into artificial food matrices that zooplankton either feed upon or ignore. To further understand these processes, Kubanek wants to determine the physiological effects of zooplankton’s diets. “Do they grow more slowly or lay fewer eggs because of the chemical compounds they consume or avoid?”

Kubanek continued, page 3

Tapping into the origins of life

David Terraso
Institute Communications and Public Affairs

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ince Charles Darwin proposed his theory of evolution, scientists the world over have been trying to understand just how the process started. How did the atoms and molecules that covered the Earth combine to form the very first life form? Researchers at Georgia Tech have discovered a crucial link in the early history of RNA, a molecule that many scientists believe was the first form of life on Earth.

Adding a small molecule, dubbed a “molecular midwife,” researchers increased the rate that DNA, a close cousin of RNA, forms in a chemical reaction 1,000-fold over a similar reaction lacking a midwife. The discovery is an important step in the effort to trace the evolution of life to the very beginning: the earliest self-replicating molecules. These results were reported in the April 2 edition of the German chemistry journal Angewandte Chemie.

“We are working to uncover how molecules similar to RNA and DNA first appeared on Earth around 4 billion years ago,” said Nicholas Hud, associate professor of chemistry and biochemistry. “Our theory is that small, simple molecules acted as templates for the production of the first RNA-like molecules. Many of these small molecules, or molecular midwives, would have worked together to produce RNA by spontaneously mixing and assembling with the chemical building blocks of RNA.”

In contemporary life, RNA is present in all cells and is responsible for transmitting genetic information from DNA to proteins. Many scientists believe that RNA, or something similar to RNA, was the first molecule on Earth to self-replicate and begin the process of evolution that led to more advanced forms of life.

RNA continued, page 2
College of Management holds inaugural awards ceremony

Elizabeth Campbell
Institute Communications and Public Affairs

The College of Management celebrated the vision, achievement and leadership of its alumni leaders at its inaugural awards ceremony on April 30. The impressive group of entrepreneurs, CEOs and retired business leaders reflected a wide range of industries from finance and real estate to manufacturing and retail.

Eleven College of Management alumni were inducted as the first members into the Hall of Fame, the Academy of Distinguished Alumni and the Council of Outstanding Young Alumni.

“The impressive accomplishments that earned you this honor are all the more important because they so positively reflect on the College of Management and Georgia Tech,” said President Wayne Clough. “You represent the essence of Georgia Tech — a strong education, a competitive spirit and a drive for excellence. The Hall of Fame inductees have demonstrated sustained and meritorious career leadership, a passion for Georgia Tech, and the highest level of integrity. They are honored for extraordinary investments of their time, talent and treasure. The 2004 inductees include: James Poole, IM ’42; Julian LeCraw, IM ’52; Lawrence Huang, GMGT ’75; Charles Brady, IM ’57; Gary Jones, GMGT ’71; and John Staton Jr., IM ’60.

The Academy of Distinguished Alumni inductees have made significant contributions to business, Georgia Tech, and society at large. They are honored for their professional achievements and the impact of their careers and leadership on the reputation and mission of the College. The 2004 Academy of Distinguished Alumni inductees include: Michael Neal, IM ’75; Alan Lacy, IM ’75; Ernest Scheller, IM ’52; and Julian Saul, IM ’62.

The Council of Outstanding Young Alumni members have distinguished themselves through career achievements,” said Terry Blum, dean and Tedd Munchak Chair in the College of Management. “The reputation of the College is enhanced by their professional success, and their generous service has been essential in our effort to achieve our goals. Each of them has made a tremendous difference in advancing the reputation and mission of the College.”

Mary DeWeerth, IM ’86, noted, “Our honorees have distinguished themselves through their career achievements.”

For more information...

College of Management
www.cmg.gatech.edu

Hud and graduate student Swapan Jain freeze samples in liquid nitrogen.

“Most recently we have demonstrated in our laboratory that proflavin can also work as a molecular midwife for RNA formation, as well as DNA,” said Hud. “We are very excited about these results. However, our ultimate goal is to achieve a self-replicating molecular system that is capable of evolving.” That development, he noted, is still several years away.

RNA continued from page 1

Hud first proposed the idea of a molecular midwife in a paper published in the Journal of Theoretical Biology in 2000, along with co-author Frank Anet, professor emeritus at UCLA. The problem they said was this: When you throw all the components together to form RNA, the individual components do not spontaneously form RNA. However, there may have been other molecules present at the dawn of life that would have increased the chances RNA would form. If true, then it could provide a missing link in the evolution of life’s earliest molecules.

Hud and Anet, along with Georgia Tech students Swapan Jain and Christopher Stahle, tested their idea by using the molecule proflavin to aid the chemical synthesis of DNA. They found that proflavin accelerates by 1,000 times the rate at which two short DNA molecules become connected into a larger DNA molecule.

‘At first, we simply wanted to determine if our idea for the role of a molecular midwife in early life was at all feasible. We used proflavin as a test midwife because it is known to bind in between the base pairs of RNA and DNA, a feature that we believed to be important for midwife activity. Now we are testing other molecules for midwife activity, and attempting to determine which ones could have been present on Earth at the time when life began,” said Hud.

The First Molecule of Life

Solving the puzzle of how the first RNA molecules formed is crucial for scientists who want to trace the evolution of life to its origins. In today’s world, DNA, RNA and proteins are all involved in replicating each other. Cells use proteins to replicate DNA and RNA; in turn, RNA is needed to make proteins.

In the early 1980s it was discovered that RNA is capable of both carrying the genetic information needed to make a new molecule and catalyzing chemical reactions; the latter task is currently done primarily by proteins in living cells. So if RNA can do both its job and that of proteins, then proteins didn’t need to be present for the first RNA molecules to form and replicate. Given that DNA requires one more step to make than RNA, many scientists concluded that RNA was the first molecule of life.

So if RNA came first, how did it get here? Hut’s theory is that much like a ladder with one side lopped off, RNA is made up of a long chain of sugars and phosphate groups — known as a polymer backbone — forming one side of the ladder and with four different types of molecules — known as bases — forming the rungs. In the beginning, individual bases may have been connected to sugars and phosphate groups to form molecules called nucleotides. It’s well known that left to their own devices, the bases of nucleotides won’t bond with each other with any great frequency, as they do in the well-known double helix of DNA.

If, as Hud and company propose, a molecular midwife such as proflavin were present, it would create a platform on which two bases could stack and pair with each other. As pairs of nucleotide bases stack with interspersed midwives, in a Dagwood-style sandwich, the nucleotides can stitch together to form molecules such as RNA or DNA. Once these molecules are long enough, the midwives can float away and the bases would remain paired in a double helix, or separate to promote the formation of more RNA molecules, depending upon solution conditions.

www.whistle.gatech.edu

This is the latest article in an ongoing series focused on the research currently under way at Tech. A complete archive of stories is available at www.innovations.gatech.edu.

May 17, 2004

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Clough cited for a lifelong commitment to education

Sean Selman
Institute Communications and Public Affairs

President Wayne Clough was honored last week by the nation’s oldest engineering society for his lifelong commitment to education.

Clough received the 2004 Outstanding Projects and Leaders (OPAL) award from the American Society of Civil Engineers (ASCE) during the organization’s annual awards gala May 12.

“Throughout his career, Wayne has contributed greatly to the education of civil engineering students,” ASCE President Patricia Galloway said. “His teaching, research, administrative and professional leadership has touched an astounding number of people.”

The ASCE instituted the OPAL Awards in 2000 to recognize the lifetime accomplishments of civil engineers whose contributions have greatly enhanced the health, safety and economy of the nation and the world.

“I am very flattered to receive such an honor from my civil engineering peers. It’s very meaningful to me, and I’m deeply appreciative to ASCE for selecting me. In doing so, they are also selecting Georgia Tech and recognizing our excellence here. This institution has evolved so impressively since my days as a student and it has been a privilege to work with the faculty, students and staff to reach our current status. They have been partners in my leadership and I’m happy to accept this as a recognition of that.”

Clough began his career 40 years ago as an assistant professor at Duke University. From there he moved to Stanford University, where he became a full professor. In 1982 he transferred to Virginia Polytechnic and State University as a professor of civil engineering and coordinator of its geotechnical programs.

Fall semester will mark Clough’s 10th anniversary as Tech’s president.

It was at Virginia Tech in 1990 that Clough began his career in administration as dean of the College of Engineering. He then rose to the rank of provost and vice president for academic affairs at the University of Washington in 1993.

In September 1994 Clough became Georgia Tech’s tenth president and the Institute’s first alumnus in that office. During his tenure, enrollment has increased from 15,000 to 16,600, and test scores and retention rates have risen dramatically.

In part because of these efforts, Georgia Tech has been ranked in the top ten of U.S. News and World Report’s top public universities list since 1999.

Clough’s commitment to increasing diversity is evident in the Institute’s 71 percent increase in minority enrollment during the past decade and in its 39 percent increase in female enrollment. Recognized as a national leader in graduating minorities and women in engineering and science fields, Georgia Tech ranks first in the nation at all degree levels combined. Meanwhile, the number of female faculty members has increased 81 percent, and the number of minority faculty members has increased 90 percent over the past 10 years.

Also during his tenure as president, Georgia Tech became the Olympic Village for the 1996 Centennial Olympics, and the Institute initiated a capital campaign that raised more than $700 million. Clough’s leadership has helped to reshape the campus during the past decade, with Georgia Tech adding $1 billion in new facilities and more than 5.2 million square feet of new space. For seven consecutive years research expenditures have increased, and a statewide regional engineering program was implemented.

As a result of his research activities, President Bush nominated Clough to the President’s Council of Advisors on Science and Technology. Clough also is a member of the Harlow Foundation Task Force on National Security in the Information Age.

He also is a member of the executive committees of the U.S. Council on Competitiveness and the Metro Atlanta Chamber of Commerce, and he is a trustee of the Georgia Research Alliance.

Clough received his bachelor’s and master’s degrees in civil engineering from Georgia Tech and his doctorate in civil engineering from the University of California at Berkeley.

Founded in 1852, ASCE represents more than 153,000 civil engineers worldwide and is the nation’s oldest engineering society. ASCE celebrated its 150th anniversary in 2002.

IN BRIEF:

Alumni tapped for next class of astronauts

Now that NASA has set its sights on sending humans to Mars, Shane Kimbrough is hoping he’ll be blasting off to the red planet.

A Georgia Tech alumnus and Atlanta native, Kimbrough was recently named as one of 11 astronauts tapped to be part of NASA’s Astronaut Class of 2004. The astronauts will be the first since President George W. Bush announced his new vision for space exploration in January.

“Once I finish my first year of astronaut training, I hope to be assigned to several technical jobs so I can improve myself professionally,” he said. “But then I’ll be thrilled to take on any space mission — even to the moon or Mars.”

Kimbrough, 36, will serve as a mission specialist.

Kimbrough is an Army major and currently works for NASA as a flight simulation engineer on the Shuttle Training Aircraft at the Johnson Space Center in Houston. A graduate of the U.S. Military Academy at West Point, Kimbrough graduated from Georgia Tech with a master’s degree in operations research in 1998. He also graduated from The Lovett School in Atlanta.

“I have been fascinated by space travel since I was a kid. I want to explore the unknown,” Kimbrough said.

Kimbrough and the other 10 candidates will report to NASA’s Johnson Space Center this summer to begin their training.

Rich building after hours access requires BuzzCard

The Office of Information Technology (OIT) will begin locking the doors to the Rich building overnight and on weekends. The doors will remain open to the general public during regular business hours, 6 a.m. to 5 p.m., Monday through Friday. Anyone with a valid BuzzCard can enter the Rich building after hours by using the BuzzCard reader at the ground-floor front entrance on Fourth Street. After-hours wheelchair access is available now by calling 894-4669, and after-hours accommodations for the disabled will be improved in the near future.

OIT is making this change because the need for after-hours access has declined and the need for security has increased. The BuzzCard requirement will make the building safer for the Georgia Tech students, faculty, and staff who need to access the Rich building after hours to work or to pick up print jobs.

GT Crew wins three medals at intercollegiate championships

The Georgia Tech crew team took home three medals in the Dad Vail Regatta, the national championships of collegiate crew competitions held in Philadelphia earlier this month. The women’s team won a gold medal in the lightweight four event, while the men grabbed silver medals in both the varsity lightweight eight and the freshman lightweight eight.

This year’s race featured 108 teams from universities across the country. Coach Rob Canavan said his team’s regimen of practicing eight times a week paid off. “To put in that amount of time on top of their school work,” he said, “you have to be a true competitor and a bit of a maniac.”

The Tech crew team has won 11 medals in its last 12 appearances at Dad Vail.
C A M P U S E V E N T S

Arts & Culture

May 19
The Ferst Center for the Arts hosts the group exhibition “Surfaces,” exploring the different ways in which artists capture, color, etch and layer their surfaces, from 7 - 9 p.m. in the Richards and Westbrook Galleries. For more information, visit www.ferstcenter.org or call 894-9600.

May 20
The bookstore welcomes author Arnold Robbins, who will give a lecture and sign copies of “Linux Programming by Example,” at 7 p.m. For more information, visit www.gatech.bookstore.com.

May 26
The bookstore hosts Sidney Perkowitz, professor of physics at Emory University, signing copies of “Digital People: From Bionic Humans to Androids,” at 7 p.m. For more information, visit www.gatech.bookstore.com.

Faculty/Staff Development

May 27
The Office of Organizational Development sponsors a one-day seminar on “Proofreading Made Easy,” beginning at 8:30 a.m. in room 308, Savant Building. To register, visit www.trainsweb.gatech.edu/master.

May 28
The Office of Organizational Development and Environmental Health & Safety sponsors a one-day seminar on “Defensive Driving,” beginning at 8:30 a.m. in room 102A, MIRC. To register, visit www.trainsweb.gatech.edu/master.

June 2
The Office of Organizational Development sponsors a half-day seminar on “Power Communications for Women,” beginning at 8:30 a.m. in room 308, Savant Building. To register, visit www.trainsweb.gatech.edu/master.

June 9
The Office of Organizational Development sponsors a one-day seminar on “Improving Interpersonal Communications,” beginning at 8:30 a.m. in room 308, Savant Building. To register, visit www.trainsweb.gatech.edu/master.

June 11
The Office of Organizational Development hosts a brown bag on “ET Certifications,” at 11:30 a.m. in room 308, Savant Building. To register, visit www.trainsweb.gatech.edu/master.

June 15
The Office of Organizational Development sponsors a brown bag seminar on “Using Our Educational Assistance Programs,” from 11:30 a.m. to 1 p.m. in room 308, Savant Building. To register, visit www.trainsweb.gatech.edu/master.

Miscellaneous

May 19
The last day to register for summer Options classes. Late registration will be available May 20-21 for an additional fee. To see a list of classes, visit www.fun.gatech.edu/SummerOptions.

May 31
Campus closed in observance of Memorial Day.

June 2-3
Registration for summer intramurals — softball, kickball, sand volleyball or 3-on-3 basketball — will be online from 8 a.m. - noon. All full-time faculty and staff are eligible, provided they are eligible to gain entrance into the new Campus Recreation Center (CRC). For more information, visit www.crc.gatech.edu.

Ongoing

Techmasters — Tech’s chapter of Toastmasters International for faculty, staff, students, alumni and spouses — meets every Thursday at 7:30 a.m. in room 102, MIRC. For more information, visit www.techmasters.gatech.edu or e-mail terry.nolan@business.gatech.edu.

C L A S S I F I E D S

Appliances

Neatroom washer and dryer, approx. 4 years old, both work great, $150 for both or best offer. Call 894-3646 or e-mail william.robinson@gtri.gatech.edu.

Autobikes

1992 Honda Prelude. 120,500 miles, clean, very reliable, all records, 5-speed, silver, special wheel, spoiler, tachometer. AM/FM/CD. Wife says sell it, $5,499. Call Glen 770-972-1123.

1996 Honda Accord LX. Great condition, 4DR automatic, a/c, cassette, power everything. One owner, dealer maintenance, 116K miles, $5,200. E-mail keley.hundt@edl.gatech.edu.


Furniture

Contemporary wooden coffee table; rich brown/black finish with storage shelf. $225. Modern, brushed steel, three-seater dining table; glass tableshelf, $225. Modern, brushed steel, rich brown/black finish with storage. Contemporary wooden coffee table; glass tableshelf, $225. Modern, brushed steel, rich brown/black finish with storage.

Moving sale: oak living room furniture a/lamps, $400; oak dining room table w/chairs, $100; bookshelves, $100; beveled glass breakfast table w/chairs, $300; cherry bedroom suite, queen size, perfect condition, $2,500. Will deliver. Call 678-252-5757 or e-mail david.gifford@gtri.gatech.edu.

Solid oak futon frame with futon mattress. Converts from couch to double-size bed. $75. Call 404-329-0630.

Real Estate/Roommates

2BR/2BA condo in Buckhead: 17th Floor. 24-hour concierge, fitness center and swimming pool, assigned parking. Upgrades include Brazilian cherry wood floor, Corian counter-tops. Priced at $215,000. Motivated! Call 404-931-9922.

3BR/1.5BA condo for sale in Marietta, '04. Call 404-223-5613.

Bedroom for rent in Kennesaw, 5 minutes from I-75 (Chastain Rd. exit). Private bath and use of the kitchen, available 8/1. $342/month, e-mail dc116@msn.com.

Location, luxury & lifestyle in Buckhead. 2BR/2BA condo shows like a model. Hardwood, designer colors, building with pool, parking, two storage units. All appliances. PMLN 901284. E-mail paul.miceli@gtri.gatech.edu.

Sports/fitness/recreation

Men’s/women’s bicycle, 27-inch, 7-speed, like new Pacific, $75 OBO. Call 894-3646 or e-mail william.robinson@gtri.gatech.edu.

Miscellaneous

2004 Honda S2000 “Naked” street-bike. 600cc asphalt black/gray. This is a brand new bike. Must sell, baby on the way. $6,250 firm. For more information, e-mail sean.porter@ece.gatech.edu or call 678-805-8096.

1987 Fleetwood Southwind RV. Sleeper 5, refrigerator, stove, shower, sink, new generator. 78K miles, great condition, $12,500. Call 404-788-2198.

Free mixed black Labrador puppies. E-mail jess99303@outlook.com.

16-foot Hobie Cat sailboat. In good condition, new trampoline, comes with trailer. $1050. E-mail Kathy.cheek@ece.gatech.edu or call 770-975-3794.

Rollcraft Tender Vibes bassinet. $25. Evenflo Portabout car seat w/latch with two bases, $50. Evenflo Exersaucer, $25. Baby monitor, $5. Inquire about other items not listed. Call 404-630-7385 or e-mail lthornberg@yahoo.com.